



Lake Helena Watershed Nutrient TMDL Implementation Evaluation



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Cover photo: Lakeshore erosion control using the willow soil lift technique, north shore of Lake Helena, April 10th, 2010, photo by DEQ staff

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ACRONYMS

AUID – Assessment Unit Identification (number)

BMP – Best Management Practice

DEQ – Montana Department of Environmental Quality

DNRC – Montana Department of Natural Resources and Conservation

EPA (USEPA) – United States Environmental Protection Agency

HUC – Hydrologic Unit Code

MCA – Montana Code Annotated

MSU – Montana State University

NRCS – Natural Resources Conservation Service

TIE – TMDL Implementation Evaluation

TMDL – Total Maximum Daily Load

TMDL document – A document produced by DEQ to describe the total maximum daily load of a pollutant that a waterbody can receive and still support its designated beneficial uses. The document typically also contains pollutant source assessment information and a restoration strategy.

USDA – United States Department of Agriculture

USFS – United States Forest Service

USGS – United States Geological Survey

SUMMARY

The Lake Helena watershed consists of three sub-watersheds; Prickly Pear Creek, Silver Creek, and Tenmile Creek. Total Maximum Daily Loads (TMDLs) have been developed in the Lake Helena watershed for various types of pollutants, including nutrients (nitrogen and phosphorus), sediment, and metals. This TMDL Implementation Evaluation (TIE) focuses solely on the nutrient impairments (Table 1). These impairments are addressed within a two volume TMDL document.

- Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume I – Watershed Characterization and Water Quality Status Review, December 2004
- Framework Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume II – Final Report, August 2006

Table 1 – Nutrient-Impaired Waterbodies

<i>Waterbody Name</i>	<i>Pollutants</i>
Lake Helena, AUID MT41I007_010	Nitrogen, Phosphorus
Prickly Pear Creek, AUID MT41I006_030	Nitrogen, Phosphorus
Prickly Pear Creek, AUID MT41I006_020	Nitrogen, Phosphorus
Sevenmile Creek, AUID MT41I006_160	Nitrogen, Phosphorus
Spring Creek, AUID MT41I006_080	Nitrogen, Phosphorus
Tenmile Creek, AUID MT41I006_143	Nitrogen, Phosphorus

Observations and Conclusions

Local, state, and federal entities have invested many resources in characterizing water quality within the Lake Helena watershed. Hydrologic modification from dams, drains, canals, and inter-basin water transfers, combined with significant co-location of septic, agriculture, and urban pollutant sources makes it difficult to precisely quantify nitrogen and phosphorus loading to Lake Helena and its tributaries. Most analyses have concluded that the three main sources of nitrogen and phosphorus pollution are septic systems, agriculture, and municipal wastewater, and that each of these three sources will need to be addressed to achieve water quality standards.

Lewis and Clark County has worked diligently with local landowners (via the County's septic maintenance district) to fix failing septic systems and encourage landowners to adopt practices that optimize septic system treatment capabilities. Government and nonprofit partners have worked with individual landowners to fund and implement practices that reduce nitrogen and phosphorus pollution from livestock. The cities of Helena and East Helena have both invested significant time and money in upgrading and optimizing wastewater treatment plants to remove more nitrogen and phosphorus prior to discharging treated wastewater to Prickly Pear Creek.

Monitoring, planning, and the project work described above have laid the foundation for the additional work that will need to be done to restore water quality. Impaired waterbodies in the Lake Helena watershed continue to be heavily impacted by nitrogen and phosphorus pollution, and none of them are potential candidates for removal from DEQ's list of impaired waters at this time. Although additional monitoring and modeling can provide more knowledge about pollutant sources and pathways, the focus should now be on designing and implementing projects to reduce nitrogen and phosphorus loading from septic systems, agriculture (hay/alfalfa and livestock), and municipal wastewater.

1.0 – PURPOSE OF TMDL IMPLEMENTATION EVALUATIONS (TIEs)

The Montana Department of Environmental Quality (DEQ) develops Total Maximum Daily Load (TMDL) documents to provide a framework for water quality restoration efforts. Then, DEQ works with local, state, federal, and private partners to provide assistance to local entities conducting water quality improvement activities. DEQ periodically reviews the progress of restoration efforts, and publishes the results as TMDL Implementation Evaluations (TIEs).

The Lake Helena Watershed Nutrient TMDL Implementation Evaluation (Lake Helena Nutrient TIE) accomplishes the following goals:

- Provide a TMDL implementation evaluation consistent with the requirements of Montana State Law (75-5-703(9) MCA).
- Evaluate the success of on-the-ground efforts to address water quality impairments, and provide constructive feedback to local entities involved in these efforts.
- Suggest potential next steps for DEQ involvement in addressing water quality impairments.

2.0 – BASIC PROBLEM DESCRIPTION AND IMPLEMENTATION RECOMMENDATIONS FROM THE TMDL DOCUMENT

As described in the TMDL documents, excess nutrient loading to several waterbodies (Table 1) in the Lake Helena watershed is creating conditions where the nutrient water quality standards are not being achieved. This excess nutrient loading can lead to excess algal growth and conditions that negatively impact fish and other aquatic life in each waterbody.

TMDL documents outline some of the actions that may be necessary to reduce pollution to acceptable levels. The Lake Helena Watershed TMDL documents included the recommendations described below.

- Phased implementation of point sources discharge reductions through facility optimization, nutrient trading, and facility upgrades.
- Voluntary implementation of best management practices (BMPs) to address nutrient contributions from failing septic systems, agriculture, urban stormwater runoff, and other nonpoint sources of pollution.
- Reduction in sediment loading (sediment erosion often carries phosphorus and nitrogen into surface waters).
- Additional monitoring and modeling to better characterize water quality conditions in Prickly Pear Creek, Lake Helena, and Hauser Reservoir.
- Additional studies to develop a better understanding of the relationship between nutrient loading and stream/lake response, and the hydrologic connection between Lake Helena, the Causeway Arm of Hauser Reservoir, and Hauser Reservoir as a whole.

3.0 – INDICATORS OF PROGRESS

Addressing water quality impairments requires planning and projects, guided by monitoring. In preparing the Lake Helena Nutrient TIE, DEQ staff reached out to a wide variety of local, state, and federal entities believed to be involved in these efforts. From these contacts, DEQ compiled a list of

planning, restoration, and monitoring activities that together give a good indication of the progress being made to address nutrient pollution sources in the Lake Helena watershed (see Attachment B). It's important to note, however, that these indicators did not account for the many decisions that watershed residents have made on their own, without public recognition, to implement practices that reduce nutrient pollution.

4.0 – PROGRESS ANALYSIS

Public entities, private citizens, and local conservation organizations have already contributed significant time, money, and other resources towards reducing nutrient pollution in the Lake Helena watershed. This has led to reductions in nitrogen and phosphorus pollution from city wastewater treatment plants, livestock operations, and even individual households. In early 2018, DEQ gathered available data from local, state, and federal entities, and summarized it in a report to the Montana Legislature's Water Policy Interim Committee and a smaller supplemental document (*Nutrient Pollution in the Lake Helena Watershed – A status update for the Water Policy Interim Committee* and the related, *Further Analysis-March 2018*). These analyses showed that significant, additional reductions in nitrogen and phosphorus pollution from agriculture, municipal wastewater treatment plants, septic systems, and perhaps other sources will be necessary to meet nutrient water quality standards and restore support for all beneficial uses within the Lake Helena Watershed.

There is a lot that watershed residents can look back on with a sense of pride and accomplishment, and the good work that's been done should serve as a strong foundation for the work that still needs to be completed. The following is a summary of current conditions in the Lake Helena watershed.

Nutrient pollution in the Lake Helena watershed comes from both major and minor sources. The three largest potential sources can be mapped (see Attachment A). They include (in no particular order):

- Septic system and other onsite wastewater treatment system discharges that enter streams, drains, canals, and lakes through groundwater
- Treated wastewater from the cities of Helena and East Helena (discharged to Prickly Pear Creek under State permits)
- Agriculture, including both livestock and hay and alfalfa production

Smaller sources of nutrient pollution are more disperse, and sometimes difficult to pinpoint on a map. They include (in no particular order):

- Urban and suburban stormwater
- Lawn and garden fertilizers
- Golf courses and other large turf management sites
- Road runoff and other forms of erosion that can carry phosphorus and nitrogen in sediment
- Wildlife and other natural sources
- Placement of pollutant sources (houses, cropland, livestock pens, businesses) on streambanks, in floodplains, and in areas with shallow groundwater
- Mining

In addition to these sources, several conditions have reduced the ability of the watershed to dilute and process nutrients. These include (in no particular order):

- Loss of riparian buffers

-
- Draining and filling of wetlands
 - Loss of floodplain/stream connectivity
 - Hastened rates of runoff due to an increase in impervious surfaces (e.g. roofs, pavement)
 - Water withdrawals for domestic and agricultural use

5.0 – CONCLUSIONS AND RECOMMENDATIONS

Nearly all the existing water quality analyses have concluded that the three main sources of nitrogen and phosphorus pollution are septic systems, agriculture, and municipal wastewater. There also seems to be a consensus that each of these three sources will need to be addressed to achieve water quality standards. The three largest sources of pollution (septic, agriculture, and municipal wastewater) will each need to be addressed to fully restore water quality from the harmful effects of nitrogen and phosphorus pollution. Based on the water quality data, planning documents, and project implementation information available, DEQ has drawn the following conclusions:

- Nitrogen and phosphorus pollution prevention activities within the Lake Helena watershed have resulted in improvements in water quality.
- Conditions in the impaired water bodies have not yet improved to the point that water quality standards are being met.
- To achieve water quality standards and fully restore support for beneficial uses, **significant reductions in nitrogen and phosphorus loading will be necessary for each of the three major sources (septic, agriculture, and municipal wastewater).**
- Over the last 15-20 years, water quality in the Lake Helena watershed has been monitored and analyzed at varying degrees. To achieve improvements in water quality, additional focus is needed on funding and implementing projects and practices that reduce nitrogen and phosphorus pollution from septic systems, livestock and hay/alfalfa production, and municipal wastewater.

Additionally, since the Lake Helena watershed TMDLs were written, DEQ has developed numeric nutrient criteria. Future water quality assessments will likely need to consider these new criteria. However, the target values in the existing TMDL documents are sufficiently similar to the numeric nutrient criteria so as not to materially affect the conclusions offered in this TMDL Implementation Evaluation.

Below are specific recommendations for how to address nutrient pollution from the three major sources in the Lake Helena watershed. (Attachment C contains additional conclusion information.)

5.1 – HAY AND ALFALFA PRODUCTION

Most of the farmable land in the Lake Helena watershed exists on valley floors with relatively high water tables. Particularly in the Lake Helena valley, the water tables are artificially lowered via drains to facilitate crop production. Fertilizer (especially nitrogen) that leaches down through the soil and out of the root zone can quickly reach groundwater and be drawn into drains that flow to nearby streams or directly to Lake Helena. Besides soil permeability and groundwater flow rate, irrigation practices play a key role in determining how much fertilizer leaves the root zone and enters the groundwater/surface water system. Irrigation methods generally fall into one of three categories: pivot, sprinkler (wheel line / hand line), and flood. Of these, pivot irrigation is generally the most efficient at delivering adequate water without flushing water and nutrients below the root zone. Sprinkler irrigation is somewhat less

efficient, due to the longer return interval between applications and the need to try and “bank” as much water in the soil as possible. Sprinkler irrigation almost always results in some leaching of nutrients below the root zone. Flood irrigation is the least efficient method, and can lead to significant leaching of nutrients to the groundwater/surface water system.

Recommendations:

- Where possible, convert flood irrigation and sprinkler irrigation to pivot irrigation. (USDA, NRCS Farm Bill programs could potentially help fund this work, as could the DNRC/DEQ State Revolving Fund loan program.)
- Install deep-rooted, permanent vegetative buffers between fields and waterways.
- Avoid placing irrigation infrastructure (pivots/canals/etc) in floodplains, riparian areas, and wetlands.
- Evaluate nutrient and water application rates to prevent over-application.

5.2 – LIVESTOCK

Riparian areas and wetlands are some of the most abundant sources of food, water, and shelter, making them highly attractive to livestock. Enabling or forcing livestock to congregate near these areas can introduce nutrients into the water.

Recommendations:

- Neighbors, government agencies, conservation districts, and watershed groups should reach out to livestock owners, one person to another, to encourage and assist with projects to move pens and corrals away from streams, canals, drains, wetlands, and other live bodies of water.
- State and federal land management agencies should work with ranchers to plan and implement riparian-specific grazing management practices.
- Livestock owners should work with grazing management professionals from MSU Extension, NRCS, and private industry to develop and implement voluntary riparian and rangeland health monitoring, and to identify and implement practices to reduce livestock impacts to water quality.
- County governments may wish to consider requiring minimum setbacks for siting pens and corrals near streams, lakes, and wetlands.
- DEQ and other entities may be able to help identify specific sources of financial and technical assistance to support efforts to improve livestock management for the benefit of water quality and ranch management.

5.3 – MUNICIPAL WASTEWATER

Over the last 15 years, the cities of Helena and East Helena have each completed significant wastewater treatment plant upgrades, and have actively worked with DEQ staff to optimize facility management to reduce nutrient loading in their respective discharges to Prickly Pear Creek. These efforts have significantly reduced nutrient loading to Prickly Pear Creek and Lake Helena. However, additional reductions will be needed if total nitrogen and total phosphorus water quality standards are to be achieved. These reductions may need to come from further optimization of existing treatment facilities, land application of treated wastewater, or development and implementation of new treatment technology. Where possible, municipalities should be encouraged to plan for the eventual costs of further treatment.

5.4 – SEPTIC SYSTEMS

Unlike municipal wastewater treatment facilities, septic systems are typically subject to less-stringent regulations. Also, they can be less effective at removing nutrients, particularly nitrogen in the form of nitrate, from wastewater. Septic maintenance programs, like the one established in Lewis and Clark County in 2011, can help reduce the frequency of septic system failures, and thereby help protect water quality. However, septic systems are still designed to discharge nutrients (particularly nitrates) at high concentrations. Hooking up homes and businesses to larger, more effective wastewater treatment systems is a proven method of reducing pollution from septic systems. Real estate developers can take the initiative to equip housing developments with centralized treatment systems that employ advanced treatment technology. Individual home and business owners can do their part by regularly pumping and inspecting their septic tanks, and by learning how to properly protect and maintain the health of their entire system. Detailed information on septic system maintenance and regulations can be obtained by visiting the Lewis and Clark County Septic System website (<http://www.lccountymt.gov/health/environmental-services/septic-systems.html>) or by contacting your local county health department.

5.5 – MONITORING RECOMMENDATIONS

A significant amount of data, particularly linked to sources of nutrients, has been collected in the watershed, particularly in the middle and lower reaches of Prickly Pear Creek. Future nutrient related monitoring, some of which could be accomplished via local stakeholders and volunteers, could focus on the list of below items. These efforts would ideally be in collaboration with Montana DEQ's Monitoring and Assessment personnel.

- Selecting long term nutrient trend monitoring locations along Prickly Pear Creek and possibly near the mouth of Tenmile and Sevenmile Creeks. Initial efforts should be aimed at ensuring that existing information is adequate for defining baseline conditions. The extent of future monitoring should be linked to the extent of nonpoint source BMP implementation and/or point source treatment improvements.
- Lake Helena monitoring to better determine baseline conditions.

At this time, updated nutrient impairment assessment monitoring does not appear necessary, particularly for the impaired streams.

6.0 – INFORMATION SOURCES

Numerous individuals provided information in support of TIE development. Their names and associations are described in Table 2 (below).

Table 2 – Contacts

<i>Name</i>	<i>Title</i>	<i>Organization</i>
Dawson, Megan		USFS, Helena-Lewis and Clark National Forest
Evans, Chris	District Administrator	Lewis and Clark Conservation District
McBroom, Jennifer	Watershed and Community Outreach Coordinator	Lewis and Clark County Water Quality Protection District
Meyer, Travis	PE (working with the City of Helena wastewater treatment plant)	Morrison Maierle / City of Helena Wastewater Treatment Plant
Mitzkus, Marty	Fire Staff Officer (filling in for the Helena District Ranger)	USFS, Helena-Lewis and Clark National Forest
Oaks, Hans	Geologist	USFS, Helena-Lewis and Clark National Forest
Olson, Tim	Hydrologic Technician	USFS, Helena-Lewis and Clark National Forest

Documents

Lewis and Clark Water Quality Protection District. August 2015. *Helena Area BMP Assessment Document*.

Lewis and Clark County Water Quality Protection District, and Lake Helena Watershed Group. December 2015. *Lake Helena Watershed Restoration Plan 2016-2023*.

Montana Department of Environmental Quality. December 2004. *Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume I – Watershed Characterization and Water Quality Status Review*.

Montana Department of Environmental Quality. August 2006. *Framework Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume II – Final Report*.

Montana Department of Environmental Quality. December 2017. *Nutrient Pollution in the Lake Helena Watershed – A status update for the Water Policy Interim Committee*.

Montana Department of Environmental Quality. March 2018. *Further Analysis – March 2018*.

Swierc, James, PG. Lewis and Clark County Water Quality Protection District. June 2015. *Helena Valley Non-Point Source Assessment, Ground Water Loading of Nutrients to Surface Water, Non-Point Source Nutrient Loading to Lake Helena*.

ATTACHMENTS

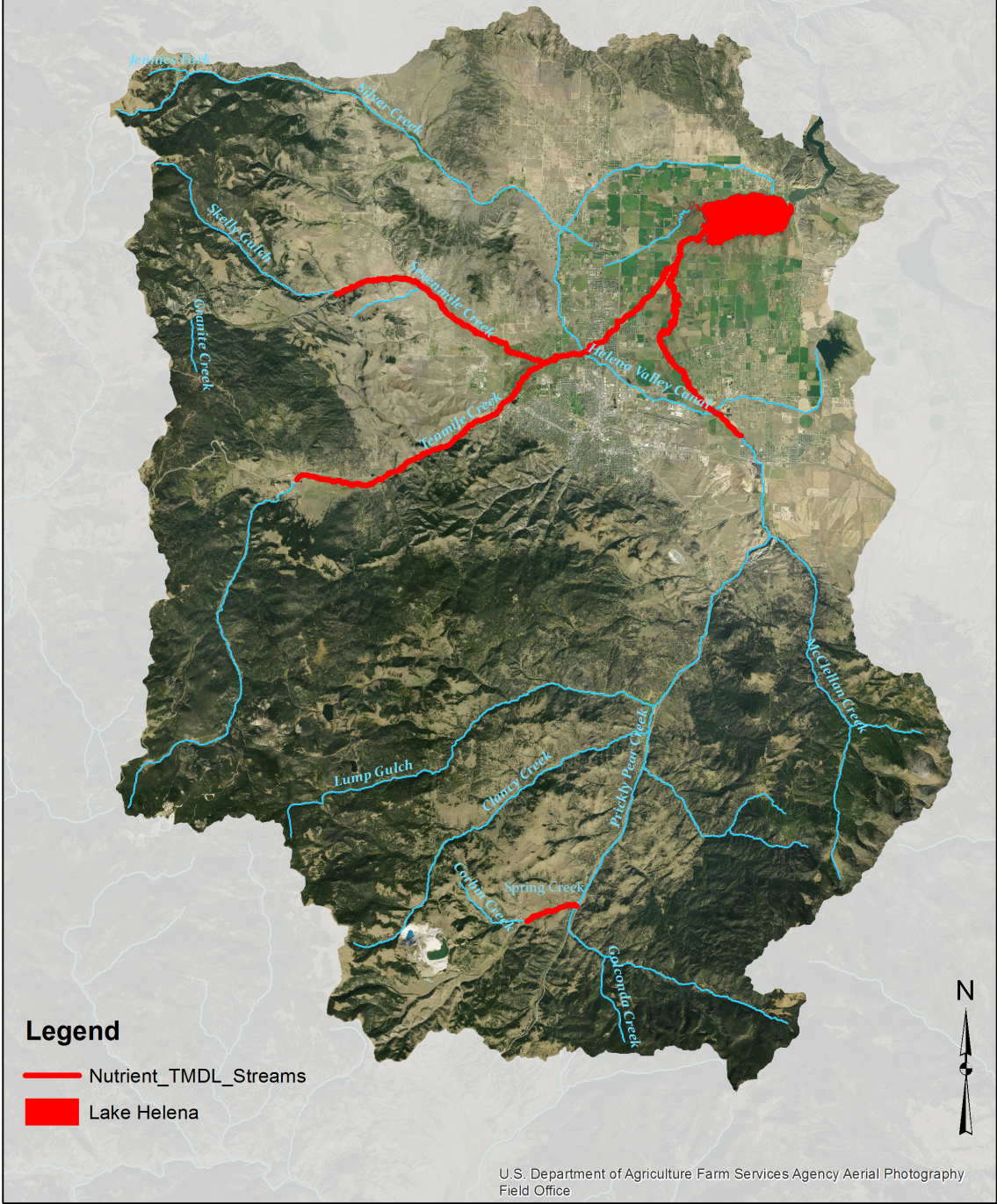
Attachment A – Maps

Attachment B – Indicators of Progress

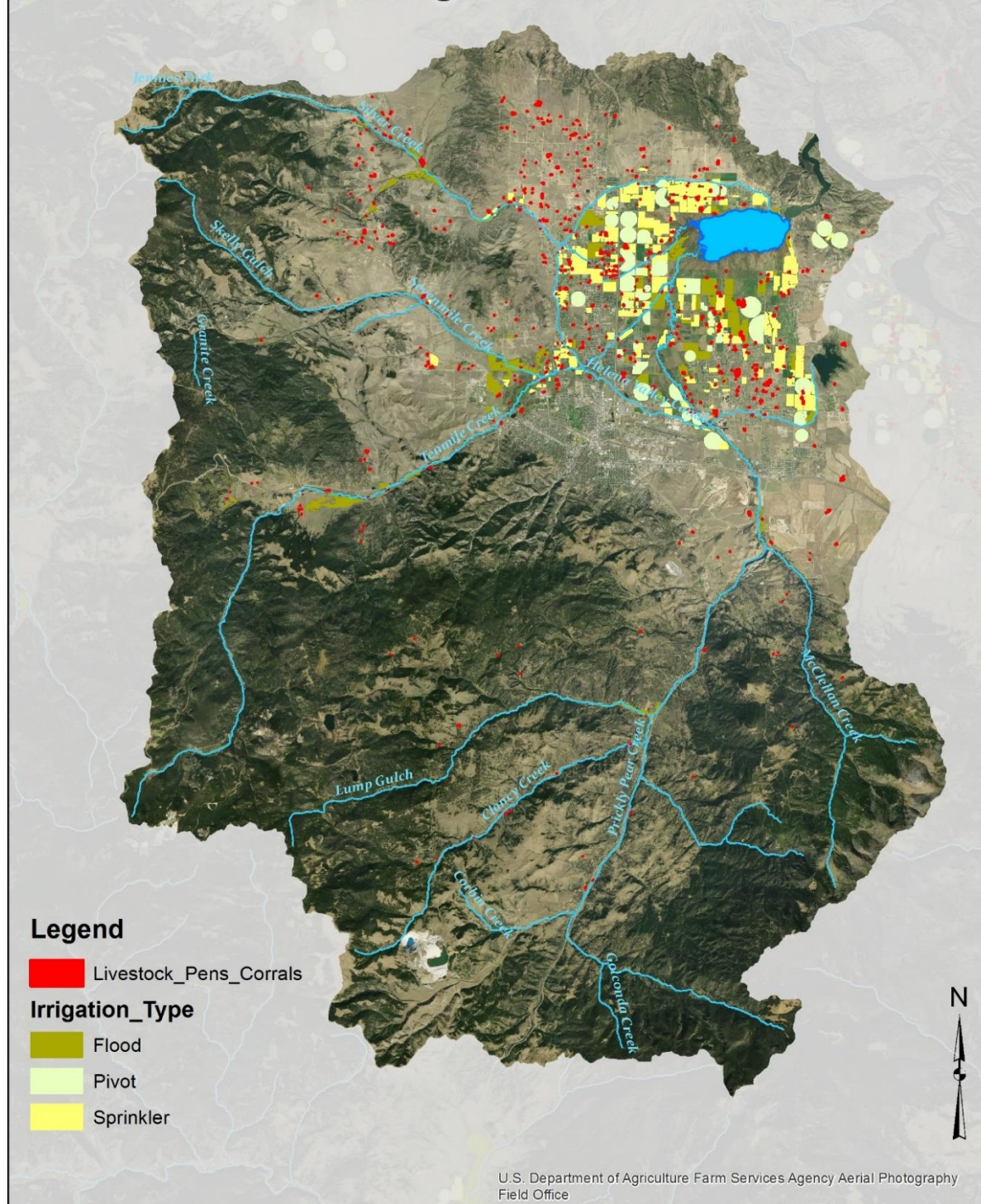
Attachment C – Conclusions Spreadsheet

ATTACHMENT A – MAPS

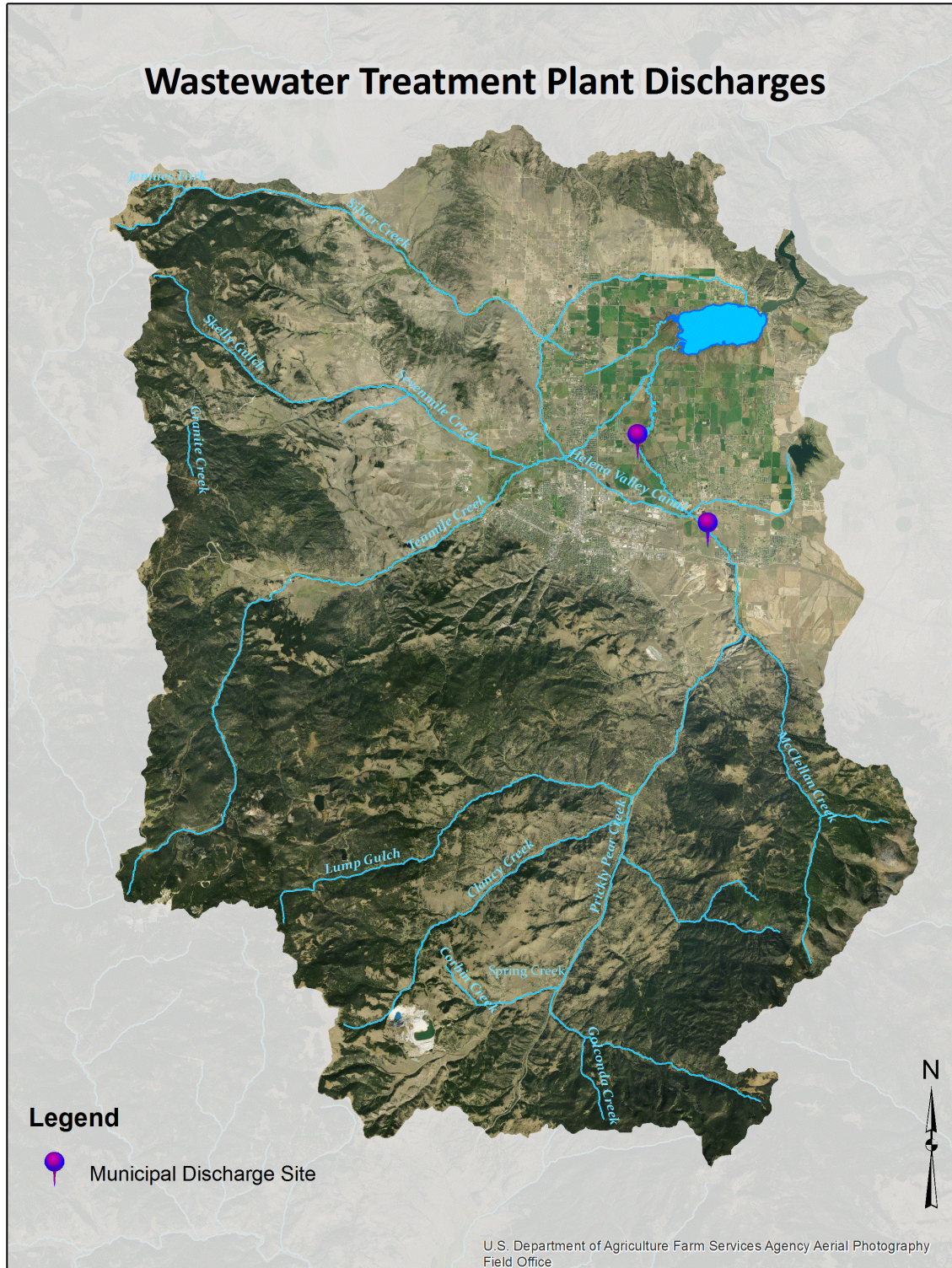
Nutrient TMDLs in the Lake Helena Watershed

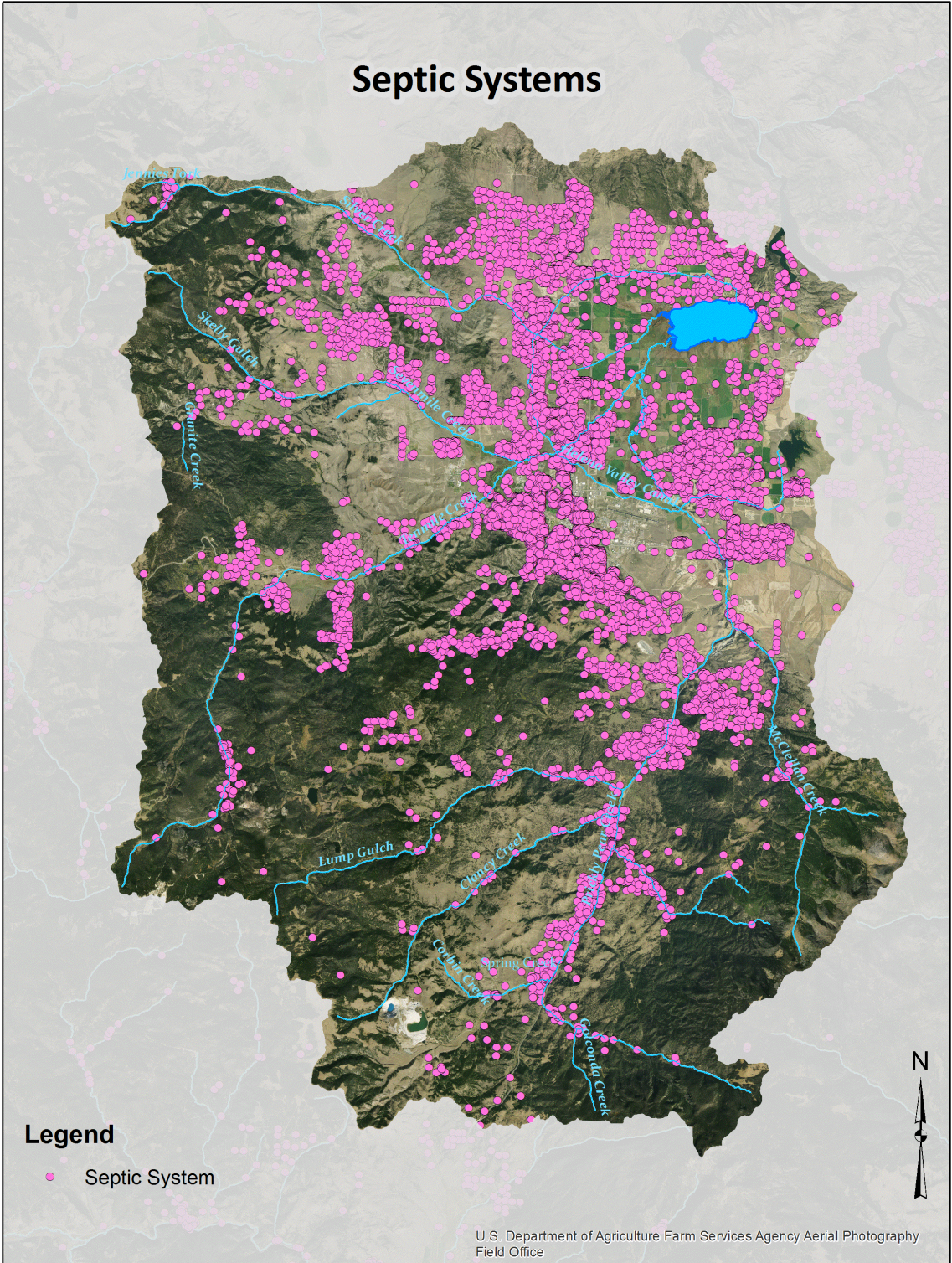


Potential Agricultural Sources



Wastewater Treatment Plant Discharges





ATTACHMENT B – INDICATORS OF PROGRESS

Planning

- Lake Helena Watershed Restoration Plan – In 2016, the Lewis & Clark County Water Quality Protection District and the Lake Helena Watershed Group prepared an EPA nine-element Watershed Restoration Plan to help guide water quality improvement activities. This plan was accepted by DEQ.
- Septic Maintenance District – In 2011, the City-County Board of Health established a county-wide Septic Maintenance Program in Lewis and Clark County. The program incorporates regulatory controls and voluntary incentives to encourage regular maintenance of septic systems in parts of the County where groundwater is particularly vulnerable to pollution. This targeted groundwater discharges to many of the Helena valley drains, and is a significant source of nitrogen loading to impaired waterbodies.
- Best Management Practice (BMP) Assessment – In 2015, the Lewis and Clark County Water Quality Protection District produced a “Helena Area BMP Assessment Document” describing where best management practices (BMPs) might be implemented to have the greatest effect on reducing nutrient loading to Lake Helena.
- Streambank Restoration Planning – Various local conservation organizations (e.g. Lewis and Clark County Water Quality Protection District, the Lake Helena Watershed Group, the Prickly Pear Land Trust) are actively identifying and designing new streambank restoration projects that will reduce nitrogen and phosphorus loading from sediment sources.

On-the-Ground Activities

- Wastewater Treatment Plant Improvements – The cities of Helena and East Helena have each completed significant wastewater treatment plant upgrades. Also, with assistance from DEQ staff, they have each implemented facility management changes to optimize the nutrient removal capability of their treatment systems. These actions have reduced nutrient load in their respective discharges to Prickly Pear Creek.
- Montana Ground Water Discharge Permitting Program – There are approximately 18 community wastewater facilities with authorizations (permits) to discharge treated wastewater to the Helena Valley aquifer. These facilities apply additional treatment actions to improve nutrient removal well beyond (5 to 20 times) the capability of a household septic system.
- Merritt Creek Project – Riparian fencing and water gaps were installed to reduce direct inputs of nitrogen and phosphorus from cattle. Revegetation of the streambanks has reduced erosion and subsequent sediment loading to Lake Helena.
- Elliot Project (lower Prickly Pear Creek) – Riparian fencing, water gaps, channel reconstruction, wetland enhancement, and extensive riparian revegetation.
- Abney-Harris Project (Tenmile Creek) – Streambank stabilization and riparian revegetation.
- Mee Project and adjacent landowner (Tenmile Creek) – Riparian fencing and streambank revegetation. Designed to reduce nutrient loading from livestock while improving riparian habitat.
- Anderson Project (Lake Helena) – Bank stabilization using willow soil lifts. Designed to prevent streambank erosion caused by ice-dozing, while enhancing shoreline habitat.
- CV Ranch Project (upper Prickly Pear Creek) – Streambank stabilization using bioengineering techniques and livestock management.

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- Prickly Pear Re-watering Project (lower Prickly Pear Creek) – A water purchasing project designed to maintain year-round flow in lower Prickly Pear Creek. In addition to greatly improving the fishery, the project also provides some dilution for the Helena and East Helena wastewater treatment plant discharges during summer low flow conditions.
 - Sevenmile Creek Project – Prickly Pear Land Trust has begun to restore 2.2 miles of stream and 350 acres of land ALONG Sevenmile Creek from the effects of long-term overgrazing and stream channel degradation (<http://pricklypearlt.org/project/peaks-to-creeks-initiative/>).
 - Spring Creek Constructed Wetland – Following the creation of the Spring Creek mine waste repository, a constructed wetland was added to the floodplain of lower Spring Creek. As water from Spring Creek flows through the structure, wetland plants remove some of the nitrogen and phosphorus.
 - Public Lands Road Maintenance – The United States Forest Service and the Bureau of Land Management conduct annual maintenance and repair of dirt roads on federal lands. This reduces erosion of sediment and associated nutrients into many different streams.
 - Rimini Road Paving Project – The United States Department of Transportation, Western Federal Lands Highway Division, in cooperation with Lewis and Clark County, the City of Helena, and the United States Forest Service completed a road relocation (away from Tenmile Creek) and paving project on 6.25 miles of Rimini Road. The project is designed to reduce pollution from sediment and associated nutrients coming from road runoff and erosion.

Monitoring

- Helena Valley Non-Point Source Assessment, Ground Water Loading of Nutrients to Surface Water, Non-Point Source Nutrient Loading to Lake Helena – A study produced in 2015 by James Swierc of the Lewis and Clark County Water Quality Protection District. The study included extensive nutrient sampling in the valley drains, groundwater wells, and streams. Using this and other data, Mr. Swierc developed estimates of the nutrient loads in Prickly Pear Creek, Tenmile Creek, Silver Creek, and the Helena valley drain system.
- Volunteer Water Quality Monitoring – The Lake Helena Watershed Group supports a volunteer water quality monitoring program. More information on the Watershed Group can be found on their website at <https://www.lccountymt.gov/health/water/lake-helena-watershed-group.html>
- Point Source Discharge Monitoring – Operators of permitted point source discharges (e.g. the Helena and East Helena wastewater treatment plants) regularly monitor the nutrient content and volume of their effluent. As a condition of their discharge permit, they report their monitoring results to DEQ.
- Agency Monitoring – USGS, the Lewis and Clark County Water Quality Protection District, EPA, the US Forest Service, and DEQ each conduct monitoring in the Lake Helena Watershed either on an ongoing basis, or in support of specific projects.
- DEQ Report to 2018 Water Policy Interim Committee – In 2018, DEQ staff used existing data to estimate nutrient contributions from various sources within the Lake Helena watershed. Their results were incorporated into a report presented to the Montana legislature’s Water Policy Interim Committee (*Nutrient Pollution in the Lake Helena Watershed – A status update for the Water Policy Interim Committee* and the related, *Further Analysis-March 2018*).
- Public Grazing Lands Monitoring – The United States Forest Service, the Bureau of Land Management, and the Montana Department of Natural Resources continue to monitor grazing on public lands. Limits on stocking density and season of use, as well as periodic monitoring for forage utilization, streambank trampling and other resource health factors help control

overgrazing and excessive impacts on water quality. Monitoring frequency and oversight varies by agency, and by the availability of staff.

ATTACHMENT C – CONCLUSIONS SPREADSHEET

Waterbody	Pollutant	BMP Status	Data Summary	TIE Conclusion
LAKE HELENA AUID MT41I007_010	Nitrogen, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Insufficient data for establishing water quality trends, estimating current conditions, or impairment reassessment.	More BMPs are needed given the likelihood of excess nutrient loading impacts to a relatively small lake.
	Phosphorus, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Insufficient data for establishing water quality trends, estimating current conditions, or impairment reassessment.	More BMPs are needed given the likelihood of excess nutrient loading impacts to a relatively small lake.
PRICKLY PEAR CREEK, Highway 433 (Wylie Dr.) Crossing to Helena WWTP Discharge AUID MT41I006_030	Nitrogen, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and perhaps trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
	Phosphorus, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and perhaps trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
PRICKLY PEAR CREEK, Helena WWTP Discharge Ditch to Lake HelenaAUID MT41I006_020	Nitrate- Nitrite (Nitrite plus Nitrate as N)	Some good BMPs implemented. Significant more BMPs are still needed.	Not applicable. Pollutant addressed through TMDL for total nitrogen.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
	Nitrogen, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
	Phosphorus, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.

SEVENMILE CREEK, Headwaters to Mouth (Tenmile Creek) AUID MT41I006_160	Nitrogen, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
	Phosphorus, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
SPRING CREEK, Corbin Creek to Mouth (Prickly Pear Creek)AUID MT41I006_080	Nitrogen, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Insufficient data for establishing water quality trends, estimating current conditions, or impairment reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
	Phosphorus, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Insufficient data for establishing water quality trends or impairment reassessment. Some data available for roughly estimating current conditions.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
TENMILE CREEK, Helena Water Treatment Plant to Mouth (Prickly Pear Creek) AUID MT41I006_143	Nitrogen, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.
	Phosphorus, Total	Some good BMPs implemented. Significant more BMPs are still needed.	Some data available for roughly estimating current conditions and trends. Insufficient data for reassessment.	More BMPs are needed. Reassessment to evaluate water quality standards attainment is not warranted at this time. Fine-scale source identification and on-the-ground projects should be promoted.