



Montana 2022-2024

Draft

Water Quality

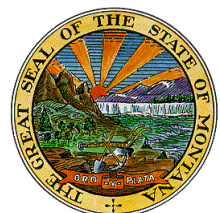
Integrated Report

Prepared in accordance with the requirements of
Sections 303(d) and 305(b) of the federal Clean Water Act

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ACRONYMS

ALUS	Aquatic Life Use Support
AML	Abandoned Mine Lands
AQB	Air Quality Bureau
ARM	Administrative Rules of Montana
AU	Assessment Unit
BER	Board of Environmental Review
BLM	Bureau of Land Management
BMP	Best Management Practice
BPJ	Best Professional Judgment
CFL	Cycle First Listed
CFR	Code of Federal Regulations
CW	Coldwater (fisheries)
CWA	Clean Water Act
CWAIC	Clean Water Act Information Center
DEQ	Department of Environmental Quality
DEQ-7	Circular DEQ-7, Montana Water Quality Standards
DNRC	Department of Natural Resources and Conservation
DPHHS	Montana Department of Public Health and Human Services
DQA	Data Quality Assessment
DQO	Data Quality Objectives
DW	Drinking Water
DWSRF	Drinking Water State Revolving Fund
EA	Environmental Assessment
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EMAP	Environmental Monitoring and Assessment Program
EPA	U.S. Environmental Protection Agency
EQC	Montana Environmental Quality Council
FBC	Flathead Basin Commission
FERC	Federal Energy Regulation Commission
FLBS	Flathead Lake Biological Station
FNF	Flathead National Forest
FWP	Montana Department of Fish, Wildlife, and Parks
FY	Fiscal Year
GIS	Geographic Information System
GWAP	Groundwater Assessment Program
GWIC	Groundwater Information Center
GWUDISW	Groundwater Under Direct Influence of Surface Water

HA	Health Advisory
HHS	Human Health Standard
HUC	Hydrologic Unit Code
ILF	In-Lieu-Fee
IOC's	Inorganic Chemicals
IR	Integrated Report
ISA	Intensive Site Assessment
IUP	Intended Use Plan
LUSTs	Leaking Underground Storage Tanks
LWQD	Local Water Quality District
MBMG	Montana Bureau of Mines and Geology
MCA	Montana Code Annotated
MCL	Maximum Contaminated Levels
MDT	Montana Department of Transportation
MOU	Memorandum of Understanding
MPDES	Montana Pollutant Discharge Elimination System
MTNHP	Montana Natural Heritage Program
MWCB	Mine Waste Clean-up Bureau
MWQA	Montana Water Quality Act
NARS	National Aquatic Resource Surveys
NHD	National Hydrography Dataset
NPDES	National Pollution Discharge Elimination System
NPS	Non-Point Source pollution
NRWQC	National Recommended Water Quality Criteria
NTNC	Non-transient non-community systems
NWIS	National Water Information System
PCBs	Polychlorinated biphenyls
POR	Period of Record
PPL	Project Priority List
PS	Point Source “pollution or pollutant”
PWS	Public Water Supply
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
SAR	Sodium Absorption Ratio
SC	Specific conductance
SCD	Sufficient Credible Data
SDWA	Safe Drinking Water Act
SOC	Synthetic Organic Chemicals
SOP	Standard Operating Procedure
STAG	State TMDL Advisory Group

SWAP	Source Water Assessment Program
SWDAR	Source Water Delineation and Assessment Report
SWM	Statewide Fixed Station Monitoring
SWP	Source Water Protection
SWPP	Source Water Protection Plan
SWTR	Surface Water Treatment Rule
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TNC	Transient non-community systems
TP	Total Phosphorus
TPA	TMDL Planning Area
TSS	Total suspended solids
UM	University of Montana
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USGS	United States Geological Survey
VOC's	Volatile Organic Chemicals
WARD	Water Quality Assessment, Reporting, and Documentation
WQMAS	Water Quality Monitoring and Assessment Section (DEQ)
WPS	Watershed Protection Section (DEQ)
WPCAC	Water Pollution Control Advisory Council
WPCSRF	Water Pollution Control State Recovery Fund
WQPB	Water Quality Planning Bureau (DEQ)
WQRP	Water Quality Restoration Plan
WQS	Water Quality Standards
WQSA	Water Quality Standards Attainment
WW	Warmwater (fisheries)

1.0 INTRODUCTION

Montana Department of Environmental Quality (DEQ) presents this Integrated Report (IR) to comply with Sections 305(b), 303(d), and 314 of the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA). It provides an analysis of the condition and trends of Montana's streams and lakes, contaminants found in groundwater, and the safety of drinking water and the degree to which waters support their designated uses.

This document contains an overview of Montana's waters and a discussion of water quality, pollution control, protection programs and restoration progress, and special concerns affecting water quality. The main focus is Montana's surface water. An analysis of the extent to which designated beneficial uses are supported is provided.

DEQ assesses surface water quality of waterbodies under state jurisdiction (waters not located on federally recognized Indian reservations). In addition, it does not actively assess outstanding resource waters (ORWs) as most ORWs are located in national parks or wilderness areas. Assessment focuses primarily on perennial rivers and streams and named lakes greater than 5 acres. DEQ has assessed the water quality of 23,111 miles of streams (49% of perennial streams under state jurisdiction and not located in ORW areas) and 521,088 acres of lakes and reservoirs (74% of named lake acreage greater than 5 acres under state jurisdiction and not located in ORW areas).

During the 2022-2024 Integrated Reporting cycle, DEQ assessed 82 Assessment Units (AUs). Seventy-seven pollutant causes on a total of 42 assessment units (AUs) were added to the 303(d) list and 115 AU-pollutant combinations were removed from the 2020 303(d) list, which is the list of waters that need a TMDL. Eighty of the AU/pollutant combination removals were spurred by TMDL development. DEQ received approval on five TMDL documents containing 80 TMDLs. Confirmed restoration efforts were successful at removing causes on five waterbodies.

DEQ released a draft selenium assessment method for Lake Koocanusa and the Kootenai River in Montana for public comment in July of 2024. DEQ deferred finalizing the assessment method due to active litigation over the applicable Lake Koocanusa, Montana selenium water column standard, codified at ARM 17.30.632(7)(a). Upon conclusion of the litigation, DEQ will finalize the selenium assessment method and, if there is sufficient and credible data available, assess Lake Koocanusa and the Kootenai River in Montana for selenium using the applicable water quality standards and the final assessment methodology.

Due to recent changes in Montana's nutrient standards for wadeable streams, and the time needed for related data analysis, DEQ does not include assessments of excessive algal growth or the following associated parameters in this Integrated Report: nitrate + nitrite, total nitrogen, and total phosphorus. Additionally, DEQ will develop and implement assessment methods for evaluating excessive algal growth and nutrient related parameters for wadeable streams, lakes/reservoirs, and large rivers. DEQ will develop updated nutrient assessment methods and implement assessments for waterbodies with associated sufficient and credible data in our next Integrated Report, scheduled for 2026.

DEQ also will not be including dissolved oxygen (DO) assessments during this Integrated Report. Upon initial implementation of a draft DO assessment method, DEQ identified many instances in which Montana's DO standards do not fully account for natural variability in DO conditions, leading to

potential impairment designations even in areas with little to no human influence. These scenarios are more readily apparent with the routine collection of continuous data using newer monitoring technologies than they were through instantaneous measurement approaches used in the past. To minimize the likelihood of error in impairment designations, DEQ is further investigating DO data collected from reference sites to consider whether modifications to the standards or assessment method are appropriate.

1.1 WHAT DO THE STATE'S WATER QUALITY PROGRAMS DO FOR MONTANANS?

DEQ's programs support and implement measures that ensure clean rivers, streams, and lakes remain part of Montana's natural heritage as provided for in the state's constitution. The programs complete steps to ensure Montana's waters stay healthy or help to improve water quality in those that don't currently support all uses.

Water Quality Standards (Goals)	DEQ formulates and adopts water quality standards for state surface and ground waters. Water quality standards are foundational to water quality protection – they define the water quality goals of state waters and serve as the regulatory basis for many actions authorized under the Clean Water Act including establishing water quality-based effluent limits, total maximum daily load targets, and identifying impaired waters. DEQ Standards Program website .
Surface Water Monitoring and Assessment	DEQ works with federal, state and local organizations to promote water quality monitoring and then assesses Montana's surface water to identify pollutants and their sources that impair beneficial uses. This information is shared with resource managers and the public. DEQ Monitoring & Assessment Program website .
Groundwater Monitoring and Assessment	The Montana Bureau of Mines and Geology and the Montana Department of Agriculture monitor groundwater water levels and water chemistry. The Montana Bureau of Mines and Geology website .
TMDL Development	The Total Maximum Daily Load (TMDL) program identifies sources of pollution and determines how much pollution a water can sustain while fully supporting all designated uses. DEQ then writes plans to reduce pollution to those waters and partners with local communities to find solutions to restore and maintain clean water. DEQ TMDL Program website .
Nonpoint Source and Wetlands Section	The State of Montana receives annual grant funds from the EPA through Section 319 of the CWA. The Nonpoint Source and Wetlands Section funds on-the-ground projects that reduce or prevent nonpoint source pollution. To improve the long-term sustainability of nonpoint source reductions, projects focus on restoring natural processes (e.g., channel migration, floodplain connectivity, and native riparian revegetation). A limited amount of funding may also be used to pay for local outreach and education activities. DEQ Nonpoint Source Program website .
Restoration Plan Development	DEQ works with local watershed groups to develop and implement Watershed Restoration Plans (WRP) that serve as a path to improved water quality. All 319-funded projects must implement practices identified in a DEQ-accepted Watershed Restoration Plan . https://deq.mt.gov/water/Programs/nonpoint

Pollution Discharge Permits	DEQ's Water Protection Bureau issues pollution discharge permits under the Montana Pollution Discharge Elimination System (MPDES) and Montana Groundwater Pollution Control System (MGWPCS) programs. These permits act as a control measure on pollution. Other activities include public education, application review, setting site-specific effluent limits, best management practices determinations, data review and management, regulation and guidance preparation, and field inspections. https://deg.mt.gov/water/assistance
Community Assistance & Support	The Water Quality Division encourages businesses, local governments and citizens to adopt new technologies and practices that limit environmental damage to state waters caused by point source pollution. Towards that end, DEQ provides financial and technical assistance to overcome market and institutional barriers hindering the implementation of cleaner business and public works practices and the installation of infrastructural equipment.
Public Water Supplies	Working together, the Public Water Supply and Engineering Bureaus work to assure that public health is maintained through a safe and adequate supply of drinking water and that applications for proposed subdivisions are reviewed to ensure compliance with the Sanitation in Subdivisions Act. These goals are achieved through technical and engineering reviews, licensing, certifications, compliance monitoring, training, and technical assistance. Included in these reviews are evaluations of water quality impacts from wastewater disposal systems in accordance with Montana's nondegradation and mixing zone rules. DEQ Drinking Water Program website.
Source Water Protection	DEQ performs source water assessments to provide water utilities, community governments, and others with information needed to protect drinking water sources. Source water assessment information tells residents exactly where their water supply comes from and what conditions and/or practices may pose threats to its quality. DEQ Source Water Protection Program website.
State Revolving Funds	The Montana Legislature established two State Revolving Fund (SRF) Loan Programs - one for water pollution control projects (wastewater and nonpoint source projects) and the other for drinking water projects. Both programs provide at or below market interest rate loans to eligible Montana entities. These programs are funded with capitalization grants from the EPA and are matched 20 percent with state-issued general obligation bonds. Combined, these two sources of funds create the "state revolving fund" from which loans are made and borrower repayments revolve to provide loans for future infrastructure projects. Through the Engineering Bureau, DEQ is the administering agency of these funds and assures that the technical and programmatic requirements of the program are met. The Department of Natural Resources and Conservation (DNRC) issues the state's general obligation bonds and makes loans to the project borrowers. Cooperatively, DEQ and DNRC administer the State Revolving Fund Loan Programs. DEQ Engineering Infrastructure & Subdivisions Program website.

2.0 MONTANA'S WATER RESOURCES

2.1 BASINS IN MONTANA

For program management purposes, the state's waters are grouped into four major basins containing 16 sub-major basins delineated by the U.S. Geological Survey's hydrologic unit code system (**Figure 1**). The four major basins are:

- Columbia – all waters west of the Continental Divide, including the Clark Fork, Flathead, and Kootenai rivers
- Lower Missouri – Missouri River basin from the Marias River confluence to the North Dakota border, including Montana headwaters of the St. Mary River in the Upper South Saskatchewan River basin
- Upper Missouri – Missouri River basin from the headwaters downstream to the confluence with the Marias River
- Yellowstone – all waters of the Yellowstone River within Montana and the Little Missouri/Belle Fourche watershed in southeast Montana

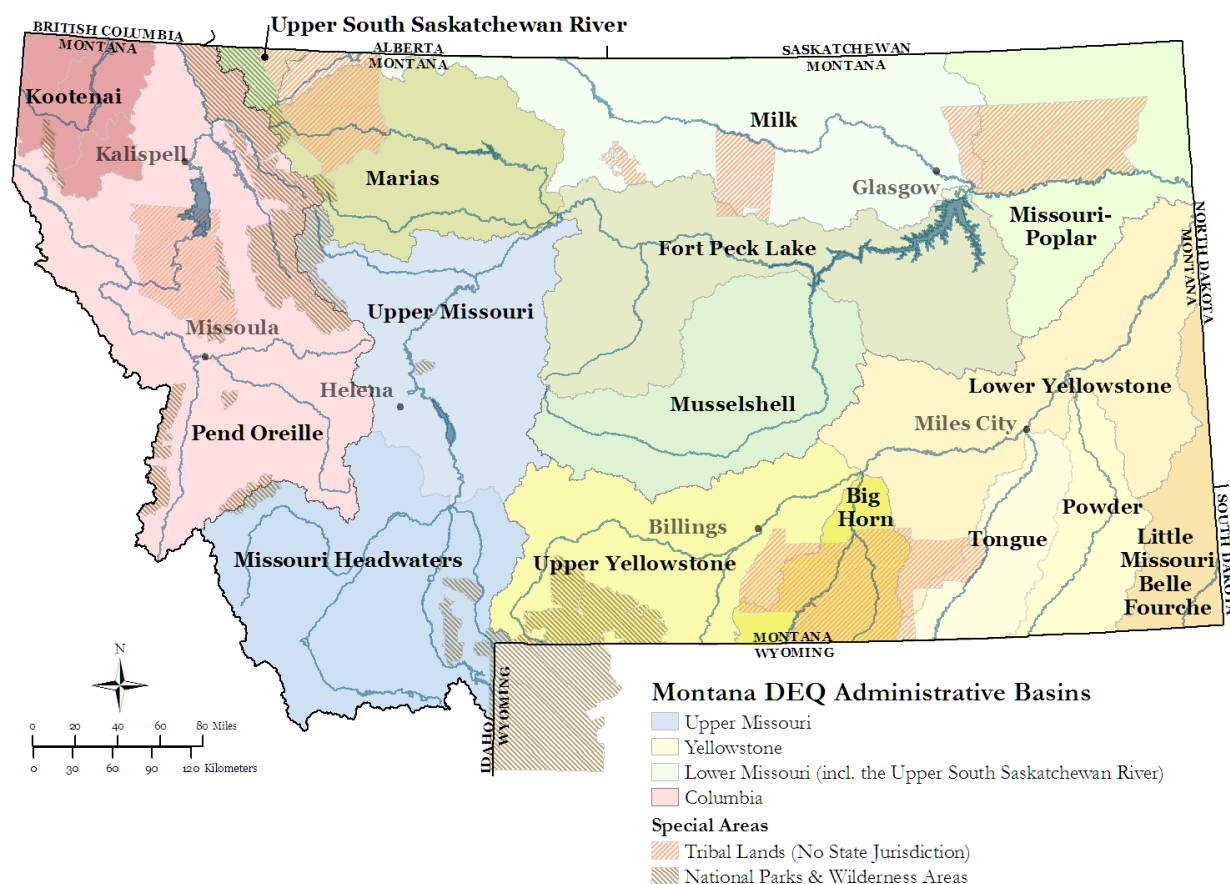


Figure 1. Basins of Montana

2.2 MONTANA PERENNIAL SURFACE WATER

DEQ does not have delegated authority over all the waters in the state. The tribal governments and/or the U.S. Environmental Protection Agency (EPA) are responsible for managing the quality of waters located within the reservations of federally recognized tribes. Waters within national parks and wilderness areas are designated Outstanding Resource Waters (ORWs).¹

The statewide stream miles and lake size estimates used for calculations in this report come from the NHD Plus High Resolution dataset.² The total length of streams is calculated from all perennial (continually flowing) waters in the dataset. Because of potential sources of error, and in order to report these numbers as accurately as possible with the available data, the summary of state waters the total stream mileage is rounded to the nearest 100 miles, while the total lake area is based on named waters of at least 5 acres in size.

2.3 SURFACE WATERS

Surface waters include rivers, streams, lakes, reservoirs, and wetlands.

2.3.1 Streams

Streams belong to one of three general categories based on their flow characteristics and relative position of their streambed to the local shallow ground water table: perennial, intermittent and ephemeral. Perennial (continually flowing) streams total approximately 57,867 stream miles. While 310,542 miles of intermittent (sometimes flowing) or ephemeral (only flowing due to precipitation) streams account for most of Montana's stream miles. Of the 57,867 miles of perennial streams, 46,837 miles are within the State's jurisdiction and not in ORW areas. Jurisdictional waters are those waters over which the state has management authority, i.e., all waters excluding tribal waters.

2.3.2 Lakes and Reservoirs

Montana has 2,192 named lakes, reservoirs, and ponds that are 5 acres or greater covering about 735,279 acres, of which 699,458 acres are under state jurisdiction and not in ORW areas. These waterbodies include various natural lakes as well as large reclamation and/or hydropower reservoirs. Of Montana's five largest lakes (i.e., listed in order of descending size, Fort Peck Reservoir, the portion of Flathead Lake under state jurisdiction, Canyon Ferry Reservoir, the portion of Lake Koocanusa located in the U.S., and Hungry Horse Reservoir), four are man-made reservoirs. Montana's largest lake, Fort Peck Reservoir, is located in northeastern Montana and is the fifth largest man-made lake by volume in the U.S. Montana's second largest lake, Flathead Lake, is the largest natural (i.e., not man-made) freshwater lake west of the Mississippi. Montana shares jurisdiction of Flathead Lake with the Confederated Salish and Kootenai Tribes.

2.3.3 Wetlands

Wetlands are valuable for providing flood and erosion control, enhancing water quality, and providing wildlife and fish habitat. Wetlands continue to be impacted and lost as roads are expanded, land is developed, and due to cumulative impacts from numerous activities such as draining, changes in land management, and landowner preference for open water ponds. DEQ's Water Quality Planning Bureau is responsible for coordinating and providing leadership to wetland conservation activities statewide. These projects range from an evaluation of wetland impacts in the State of Montana, to developing education and information about Montana wetlands, to a local partnership composed of local

government, wetland ecologist, and community volunteers to inventory wetlands for restoration and management needs.

For wetland mapping and evaluation, DEQ used the following functional definition:

“Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered in shallow water. For purposes of this definition, wetlands must have one or more of the following attributes:

- At least periodically the land supports predominantly hydrophytes;*
- The substrate is predominantly undrained hydric soil; and*
- The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.”*

Currently 100% of the state has wetland mapping; however, 13% of the mapping is outdated digital mapping created from 1980s-era aerial imagery. As of spring 2025, 2,787,934 acres of wetlands and 661,404 acres of riparian areas have been mapped in Montana. Since 2007, 87% of the state has been mapped or updated with modern wetland and riparian mapping using aerial imagery from 2005-2023 (Table 1).

Table 1. Montana Wetland Types

Montana Wetland Types	Number of Mapped Wetlands	Average Size (Acres)	Total Acres (Statewide)
Freshwater Emergent Wetland	611,364	1.9	1,138,821
Freshwater Forested Wetland	17,144	2.8	48,820
Freshwater Scrub-Shrub Wetland	120,676	2.0	237,839
Freshwater Lake	5,239	141.0	738,546

2.4 GROUND WATER

Ground water is any water that flows or seeps downward or is stored below the ground in rock crevices or other pores of geologic materials. Ground water feeds springs and wells, and the upper surface of the saturated zone is the water table. The quality and availability of ground water varies greatly across the state. A map of Montana aquifers is presented in **Figure 2**.

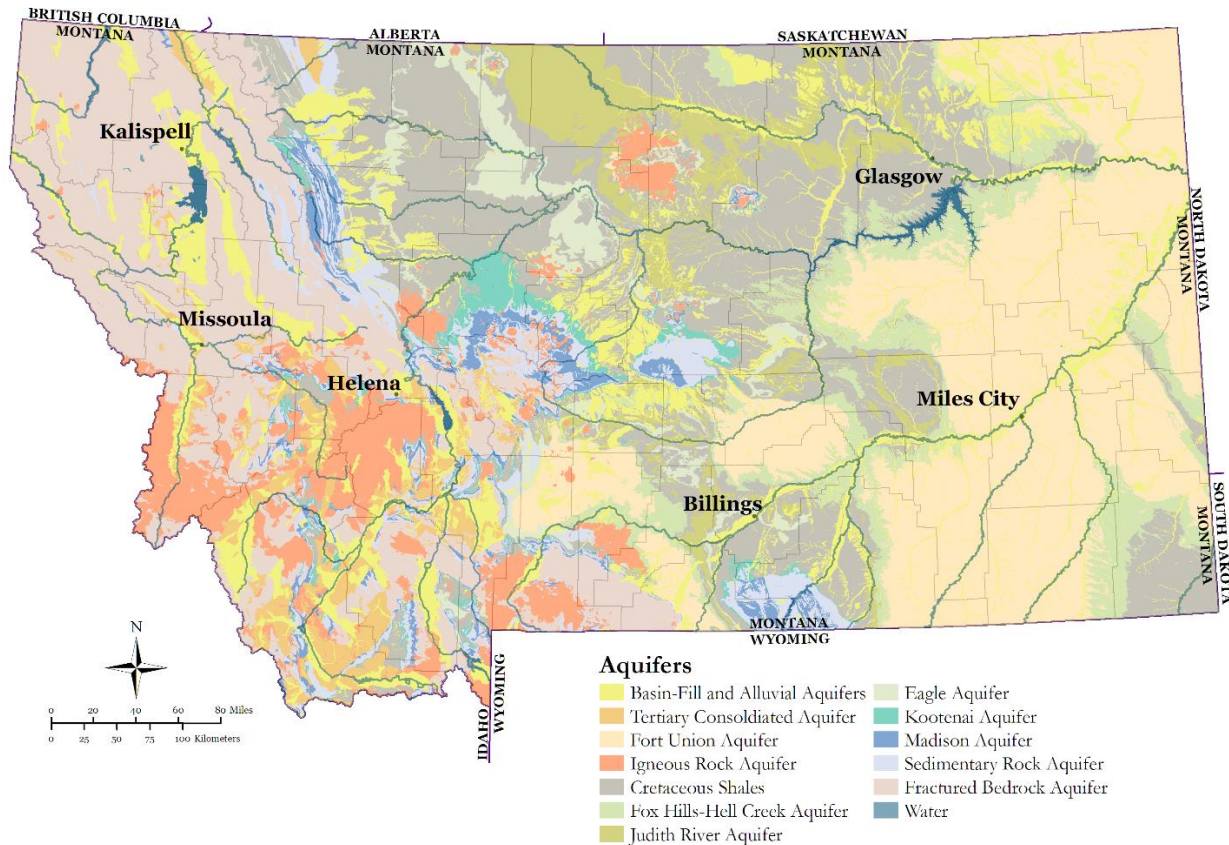


Figure 2. Montana Aquifers³

2.4.1 Alluvial and Basin Fill Aquifers

Typical of western Montana, alluvial and basin-fill aquifers are shallow, typically less than 50 feet (15 meters) thick consisting of permeable unconsolidated (loose) deposits like sand and gravel. Most alluvium is geologically quaternary (less than 2.5 million years) in age. The aquifers are replenished by streams and from precipitation. They can vary in volume considerably as the water table fluctuates. Therefore, the temperature and flow from water-table springs vary. Being shallow, they are susceptible to contamination by fuel spills, industrial discharge, landfills, and saltwater. The ground water continuously moves along the hydraulic gradient from areas of recharge to streams and other places of discharge. They provide a high level of water storage.

2.4.2 Bedrock Aquifers

Found mainly in eastern Montana, bedrock aquifers are where water is confined within hard bedrock layers. Bedrock is the hard rock that lies below all the sand, gravel and soil near the ground surface. Water can travel through porous bedrock, or through cracks, fractures and crevasses in the hard bedrock. In some areas of eastern Montana, thick shale formations near the surface make access to water difficult or produce poor-quality water. Also, aquifers in the east typically yield less water than those in western Montana. To reach higher-quality water, wells have to be drilled deeper, which is more costly. Bedrock aquifers in Montana are found in formations as old as 540 million years (Palaeozoic).

3.0 POLLUTION CONTROL

DEQ programs help reduce pollution from both point and nonpoint sources. This section describes activities that reduce pollution from entering Montana's waterways.

3.1 POINT SOURCE CONTROL PROGRAM

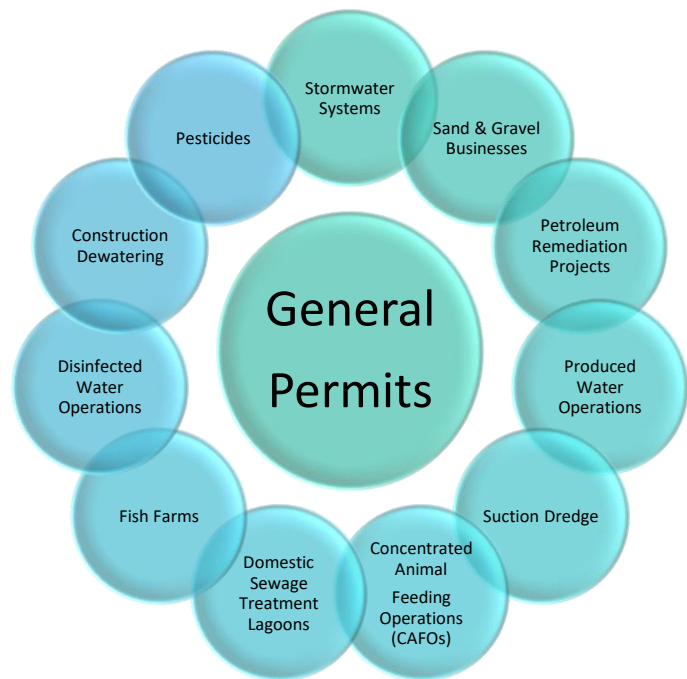
Pollutants can arise from different source types, one of which is called a point source; that is, pollutants arising as a result of human activities from a specific location, such as discharges from an industrial facility, and via an identifiable conveyance, such as a pipe. Point sources are regulated, meaning that facilities must have a permit to discharge pollutants from point sources into waterbodies. Montana administers a point source discharge program. In Montana, DEQ adopts rules governing all issues related to the state's permitting process, while EPA governs the pretreatment and municipal bio-solids control programs.

3.2 MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM PROGRAM

State and federal regulations require industries or works (e.g., construction sites, wastewater treatment plants, etc.) to have a permit before they can discharge wastes or pollutants from any point source into state waters. Montana's Pollutant Discharge Elimination System (MPDES) is the permitting program that controls point source discharges of wastewater.

Discharge permits provide a regulatory process for defining limitations of pollutant amounts. Additionally, TMDLs may be developed and provide further guidance for permitting cumulative point and nonpoint sources. If a waterbody doesn't have an approved TMDL for existing pollutant discharges, DEQ imposes effluent limitations that will protect water quality.

In addition to permits issued to individual dischargers, general permits are issued for categories of discharges that affect waters statewide or within a limited geographic range. General permits must conform to all the criteria applicable to individual discharges. Further, general permits may contain additional provisions that DEQ deems necessary to protect water quality.



In addition to controlling the discharge of pollutants from point sources into surface waters, DEQ controls pollutant discharges into ground water through the Montana Ground Water Pollution Control System (MGWPCS) permitting process. DEQ has adopted rules governing such discharges, which define a “source” as any point source or disposal system, including a waste-holding pond that under normal operating conditions may reasonably be expected to discharge pollutants into ground water.

Typical permitted facilities include residential wastewater treatment systems, metal ore mills, lumber mills, wood product manufacturers, breweries, and community water treatment plants. Pollution control standards for ground water in Circular DEQ-7 are set to protect human health and include a nonsignificance number based on DEQ’s nondegradation policy.^{4, 5} The rules include a water-use classification system for ground water based on natural specific conductance and ground water standards to protect those uses.

Ground water rules do not require minimum treatment standards for discharge from mechanical treatment. The level of treatment or pollutant control is based on compliance with the applicable water quality standards after dilution within a DEQ-approved mixing zone (i.e., an area of ground water allowed to mix with effluent before compliance is measured).

3.3 NONPOINT SOURCE AND WETLANDS SECTION

The details of the Nonpoint Source and Wetlands Section are available in the [Montana 2017 Nonpoint Source Management Plan](#).

In Montana, nonpoint source (NPS) pollution is primarily addressed via application of voluntary management practices pursued by landowners and other citizens within the state. Watershed groups, conservation districts, water quality districts and nonprofits around the state actively engage local landowners and partners to address nonpoint source pollution in socially acceptable and economically beneficial projects and programs. DEQ supports local and regional programs implementing these activities.

3.3.1 Primary Categories of Nonpoint Source Pollution

Seven major land uses contribute significantly to NPS pollution and water quality impairment: agriculture, forestry, hydrologic modification, mining and industry, recreation, transportation, and urban and suburban development. In addition, DEQ’s NPS Program works to reduce negative water quality impacts from aquatic invasive species, atmospheric deposition, and climate change.

3.3.1.1 Agriculture

Agriculture is Montana’s leading industry, with an estimated \$4.6 billion dollar impact on the economy.⁶ Farmers and ranchers are the primary day-to-day stewards of millions of acres of public and private lands in Montana. Common pollutants associated with agricultural operations include sediment, nitrogen, phosphorus, salinity, and pathogens. Certain agricultural practices can also lead to significant changes in water temperature, a loss of riparian and aquatic habitat, and other problems. Yet, in most situations, agricultural impacts are usually more easily remedied than many other sources.

Montana supports voluntary implementation of site-specific best management practices (BMPs) as an effective method of addressing NPS pollution from agriculture-related sources. DEQ’s NPS Program

focuses on four strategies to promote, facilitate, and create reductions in NPS pollution from agricultural sources:

- Strategy 1: Improve communication on NPS pollution issues among Montana’s agricultural community.
- Strategy 2: Connect agricultural producers with the technical and financial resources necessary to reduce nonpoint source pollution from farming and livestock operations.
- Strategy 3: Evaluation and adaptive management.
- Strategy 4: Maintain existing programs that address contamination of groundwater from improper application of pesticides.

3.3.1.2 Forestry

Forest lands cover 19.8 million acres in Montana, nearly a quarter of the state’s total lands. In 2018, the forest products industry contributed \$364 million in labor earnings and \$553 million in sales to the state’s economy.⁷ For forestry and forestry-related activities, the NPS Program relies on a combination of regulatory and voluntary approaches. Pollution from forestry and silviculture operations can include nutrients, sediment, and temperature (pollutants), or streamside (riparian) habitat alterations and flow alterations (non-pollutants). Riparian functions threatened by indiscriminate streamside harvesting include shading (affecting water temperature), large woody debris recruitment, nutrient cycling, streambank stability, sediment filtration, and flood-flow attenuation.

DEQ’s NPS Program is focusing on three strategies to promote, facilitate, and create reductions in NPS pollution from forestry sources:

- Strategy 1: Maintain and improve Montana’s Forestry Best Management Practices program;
- Strategy 2: Support implementation of best management practices and actions to restore and maintain water quality conditions;
- Strategy 3: Improve collaboration to implement and monitor BMPs.

3.3.1.3 Hydrologic Modification

Dams, reservoirs, stock ponds, diversions, etc. are vital and integral to Montana’s economy and way of life. This infrastructure provides water for hydroelectric power, crops and livestock, domestic water supplies, industrial applications, recreational opportunities, and flood protection. Activities leading to hydrologic modification include water storage, water withdrawal, water transfer, and physical alterations in floodplain, riparian, wetland and channel structure. Some of the negative water quality impacts from hydrologic modification include:

- Reduction in riparian vegetation along streams that can lead to increased bank erosion, increased channel migration, increased water temperature and habitat loss
- Increased water temperature from reduced streamflow
- Increased bank erosion rates from water transfers that result in unnaturally high stream flows
- Increased sediment deposition from a lack of stream flushing flows
- Reduction in pollutant dilution capacity

DEQ is addressing the negative water quality impacts of hydrologic modifications through a combination of the following strategies:

- Strategy 1: Support efforts to minimize or avoid development within floodplains, along streambanks, within wetlands and adjacent to lakes.

- Strategy 2: Support efforts to restore natural hydrologic conditions
- Strategy 3: Promote practices and activities that help minimize the impacts of hydrologic modifications
- Strategy 4: Mitigate hydrologic modifications where possible

3.3.1.4 Mining and Industry

Mining activities in Montana involve the removal of hard rock minerals, ore, coal, sand and gravel. Industry includes activities associated with the manufacturing of tangible products, and extraction and refinement of oil and gas. Frequently, state and federal regulatory programs that address pollution from mining also address pollution from industrial sources. Examples of these programs include:

- State Superfund (CECRA)
- Federal Superfund (CERCLA and SARA)
- Montana Hazardous Waste Act

3.3.1.4.1 Contribution to Nonpoint Source Pollution from Mining

NPS pollution from mining is typically the result of one or more of the following processes:

- stormwater runoff (sediment, metals, salts, petrochemicals)
- acid mine drainage (acid, lead, copper, zinc, cadmium, other heavy metals)
- direct additions of waste rock, spoil piles, or placer piles (riparian and wetland habitat loss, sediment, metals)

Discharges from active mine sites are considered point-source discharges and are controlled by the permit conditions issued under the Montana Pollutant Discharge Elimination System (MPDES).

Abandoned mines often include point sources and nonpoint sources of pollution. Discharges from abandoned mines are not typically covered under MPDES permits, leaving their control and abatement up to non-regulatory programs and the efforts of various agencies, private organizations, and individuals often in collaboration with DEQ. DEQ's strategy for addressing discharges from abandoned mines includes improving collaboration between the DEQ Watershed Protection Section (WPS) and the DEQ Abandoned Mine Lands (AML) program to address non-permitted pollution from mining-related pollutant sources.

As funding for mine reclamation becomes increasingly scarce, agencies and organizations face an ever-increasing need to pool technical and financial resources in order to complete mine reclamation projects. DEQ may use Section 319 funds to pay for abandoned mine site reclamation projects designed to protect water quality if those activities meet both of the following conditions: (1) the activities are not specifically required by a draft or final NPDES/MPDES permit and (2) the activities do not directly implement a draft or final NPDES/MPDES permit. DEQ will:

- Strategy 1: Design, fund, implement, and monitor on-the-ground projects to remediate water pollution from abandoned mines or portions of abandoned mines
- Strategy 2: Educate landowners, land managers, conservation districts, watershed groups, and others seeking to address pollution from abandoned mines

3.3.1.4.2 Contribution to Nonpoint Source Pollution from Industry

Pollution from industrial sources (manufacturing, oil refining, chemical production) is typically the result of direct discharge, stormwater runoff, seepage of chemicals into groundwater (which may come into contact with surface water), or erosion of contaminated sediments. Pollution from active, industrial facilities is typically regulated under a point source discharge permit. Pollution from inactive facilities, and in rare cases pollution from some active facilities, is addressed through application of the site remediation programs.

Montana will use the following regulatory and voluntary methods to address nonpoint source pollution from industrial sources:

- Strategy 1: Using the authorities described above, DEQ's Waste Management and Remediation Division investigates and remediates NPS pollution from industrial sources.
- Strategy 2: DEQ's Waste Management and Remediation Division collaborates, where appropriate, with EPA to investigate and remediate pollution from federal Superfund sites.
- Strategy 3: DEQ collaborates with other state and federal agencies and stakeholder groups to address pollution from industry-related sources.

3.3.1.5 Recreation

Outdoor recreation is an important and growing industry in Montana, generating over \$1.6 billion in wages and salaries annually and employing over 30,000 people.⁸ Over 620,000 outdoor recreators come to Montana each year, and this sector of the economy comprises 4.6% of the state's gross domestic product. . Many recreational activities in Montana are directly related to surface water, and those activities can contribute to nonpoint source pollution and negatively affect water quality. There is a high potential for water quality degradation associated with boating activities from aquatic invasive species, contaminated bilge water, petroleum products, trash, and solvents being released into state waters. In addition, boat wakes can increase bank erosion. If improperly designed, marinas can cause water quality problems by destroying habitat and restricting water flows. In addition to water-based recreational activities, activities on upland areas can also contribute to NPS pollution. Repeated and unauthorized travel off designated roads by vehicles, ATVs, motorcycles, and mountain bikes contribute to riparian damage and excess sediment runoff into nearby streams and lakes.

DEQ's NPS Program employs the following strategies to increase implementation of BMPs for recreational activities:

- Strategy 1: Coordinate with other agencies to educate and engage Montana's recreation community to promote stewardship and sustainability
- Strategy 2: Promote and support responsible water-based recreation.
- Strategy 3: Support off-highway travel planning and promote responsible off highway vehicle use.

3.3.1.6 Transportation

Many of the transportation routes in Montana are located in floodplains adjacent to lakes, wetlands, rivers, and streams and can be a significant source of NPS pollution. Litter from vehicles, oils and gasoline, and traction sand and road salt all accumulate in transportation corridors, potentially ending up in surface waters. Transportation routes that travel directly along streams and rivers can further limit lateral migration and floodplain function, affecting sediment transport and bank erosion.

There are a variety of programs and practices that limit the potential effects of NPS pollution from transportation sources, including stormwater permitting and construction BMPs, the MS4 Program, wetland and stream mitigation procedures, corridor planning, and the Adopt-A-Highway program. The Montana NPS Program works to increase collaborative efforts to manage NPS pollution from transportation sources and to educate road maintenance personnel about nonpoint source pollution.

3.3.1.7 Urban and Suburban Development

NPS pollution from urban and suburban sources is generated by a broad range of activities associated with domestic, municipal, industrial, and commercial land development and uses. Stormwater runoff, residential waste disposal, and alterations of riparian areas are major sources of nonpoint source pollution in Montana's urban and suburban areas.

3.3.1.7.1 Stormwater

Urban stormwater pollutants include nutrients (e.g., fertilizers), sediment, increased water temperature, oil and grease, PCBs, metals, bacteria, and viruses. Suspended sediments tend to be the largest pollutant loads to receiving waters in urban and suburban areas.

DEQ issues a Montana Pollutant Discharge Elimination System (MPDES) general permit for stormwater discharges associated with small municipal separate storm sewer systems (small MS4s), construction activity, and industrial activity. MS4 permits apply to Montana's seven largest cities - Billings, Missoula, Great Falls, Bozeman, Helena, Butte, and Kalispell. Montana also addresses stormwater through the state's subdivision permitting process and local government development regulations. Stormwater that is not addressed by an MPDES or subdivision permit can be managed through voluntary BMPs.

3.3.1.7.2 Waste Disposal

Residential and commercial waste disposal includes a variety of pollutant sources, such as septic systems, pet wastes, solid waste disposed in landfills, and hazardous chemicals and materials. Sources are addressed mainly through DEQ's solid waste program. The subdivision program oversees septic systems. DEQ strives to maintain and improve programs that address residential septic systems, solid waste disposal, land-applied bio-solids, and hazardous household wastes by implementing the following strategies:

- Strategy 1: Continue to assess contributions of septic systems to surface water-quality impairments, develop TMDLs that address pollutant loading from septic systems, and provide technical and financial assistance for projects that focus on specific septic system issues
- Strategy 2: Increase monitoring at closed landfills to detect groundwater contamination
- Strategy 3: Continue to provide technical assistance to solid waste professionals

3.3.1.7.3 Alteration of Urban and Suburban Riparian and Wetland Areas

Three types of alteration to urban and suburban riparian areas are currently of greatest concern to the NPS Program:

- The alteration of native vegetation, soils, and/or hydrology of riparian areas
- Residential and commercial development within riparian areas, floodplains, and/or channel migration zones
- The cumulative effects on watersheds by heavy riparian area usage from domesticated animals on suburban small acreages. Encourage the adoption of local regulations that protect the functions of floodplains, riparian, and wetland areas to address the cumulative effects of NPS pollution from urban and suburban development on water quality

3.3.1.8 Atmospheric Contributions

Five lakes and six rivers are listed in Montana for probable causes associated with potential atmospheric deposition (mercury and other metals). Information regarding mercury and PCBs in Montana fish populations can be found in the [Montana Sport Fish Consumption Guidelines](#) published by the Montana Department of Fish, Wildlife and Parks.

Given the resource constraints of DEQ's NPS Program, and the large-scale, often remote and/or diffuse nature of the sources of atmospheric contributions, DEQ has not yet prioritized actions from this source.

Montana's NPS pollution control strategy for atmospheric deposition is to:

- Assess sources of water quality pollution in the state
- Collaborate with DEQ's Air Quality Bureau (AQB) to identify atmospheric sources of NPS pollution in Montana and recommend actions to reduce sources where possible
- Support EPA's nation-wide air quality monitoring efforts, which include long-term monitoring sites in Montana
- Increase public awareness of atmospheric deposition on water quality using educational and outreach activities through work with DEQ's AQB

3.3.1.9 Climate Change Contributions

Cold water temperatures are critical to aquatic ecosystems in western Montana. Changing water temperatures affect cold water fish and aquatic insect communities directly by influencing metabolism. Increased water temperatures may degrade the aesthetic quality of waters by encouraging the growth of undesirable and toxic algae which harms recreation and swimming uses. In addition, a rise in water temperature correlates with higher growth and persistence of pathogens that pose risks to human health and aquatic species.⁹ Water temperature also affects the solubility of gases in water, especially dissolved oxygen, which is critical to aquatic organisms. In recent decades, stream temperature records have become more readily available due to advancements in technologies that can monitor hourly, daily, annual and seasonal fluctuations in stream temperatures.

Since the 1950's western Montana has seen a decline in its annual winter snowpack, and most of the state's glaciers are receding.¹⁰ This is the result of fewer days below freezing, which has led to less snow at mid to lower elevations and more precipitation. Warmer air temperatures, increased precipitation, and decreased snowpack creates earlier and more rapid peak runoff events from rivers and streams. Reduced snowpack and increased air temperatures in Northern Rocky Mountain streams have resulted in earlier onset ($\approx$ 1-3 weeks) of spring warming and peak runoff events with declining summer baseflows.¹¹ Lower summer flows contribute to increases in summer stream temperatures. Temperatures in Pacific Northwest streams and rivers are increasing by 0.31-0.40 °F per decade.¹²

Increases in summer air and water temperatures will continue to impact aquatic ecosystems. As Montana stream temperatures rise, cool water aquatic habitat will become more restricted. Ways to limit the effects of climate change on these streams include maintaining or restoring instream flows, enhancing riparian habitat to increase shading, and removal of instream barriers to increase fish access to more habitat. Continued temperature monitoring of streams in Western Montana is important to inform future land and water conservation decisions.

4.0 WATER QUALITY STANDARDS

Water quality standards are foundational to maintaining and protecting water quality in Montana. Water quality standards are provisions of state law which define the water quality goals of state waters and contribute to a clean and healthful environment. They consist of three core components:

1. Designated uses – present and future beneficial uses that waters are expected to support;
2. Criteria to protect the designated uses; and
3. Nondegradation requirements to protect water quality that has already been achieved.

Water quality standards and use classification systems for surface water and groundwater are defined in the Administrative Rules of Montana, Title 17, Chapter 30, and in Department Circular DEQ-7. Additional information about water quality standards can be found on the [Standards Program page](#) on the Montana DEQ website.

4.1 BENEFICIAL USE CLASSIFICATION

Montana classifies its waterbodies according to present and future beneficial uses they are expected to support (75-5-301, MCA). Montana's use classification systems for state surface waters and ground waters specify the uses that waters are to be maintained suitable for and the water quality standards that must be met by waters within each class.

Beneficial uses for state surface waters may include growth and propagation of fish (salmonid or non-salmonid) of fish and associated aquatic life, waterfowl and furbearers; drinking, culinary, and food processing; bathing, swimming, and recreation; agricultural water supply; and industrial water supply.

Beneficial uses for state ground waters may include public and private water supplies; culinary and food processing purposes; irrigation; drinking water for livestock and wildlife; and commercial and industrial purposes.

4.1.1 Use Classes for Surface Waters

Montana's beneficial use classification system for surface waters is alphanumeric; state surface waters are classified as A, B, C, or I, and use classes are further divided using numbers 1, 2, and 3 (**Table 2**).

Use classifications are designated for state waters within each major river drainage in Montana (ARM 17.30.607 through 613) and for certain types of waterbodies (ARM 17.30.614 through 617).

Table 2. Designated Beneficial Uses by Waterbody Class

Beneficial Use	Water Use Classification								
	A-Closed	A-1	B-1	B-2	B-3	C-1	C-2	C-3	I
Aquatic Life/Fishes (salmonid)		X	X	M		X	M		
Aquatic Life/Fishes (non-salmonid)					X			X	
Aquatic Life/Fishes	X								X
Drinking Water (human health)	Xsd	Xcni	Xc	Xc	Xc			M	
Recreation	X	X	X	X	X	X	X	X	X
Agriculture		X	X	X	X	X	X	M	X
Industry		X	X	X	X	X	X	M	X

X = designated use to be fully supported; M = designated use to be marginally supported; Xsd = designated use to be fully supported after simple disinfection; Xcni = designated use to be fully supported after conventional treatment for removal of naturally present impurities; Xc = designated use to be fully supported after conventional treatment

4.1.2 Use Classes for Groundwater

State ground waters are classified into four classes (I through IV) based on natural specific conductance (SC; **Table 3**).

Table 3. Groundwater Classifications

Beneficial Uses	Water Use Classification			
	Class I	Class II	Class III	Class IV
	SC ≤ 1,000 μS/cm*	SC >1,000 μS/cm and ≤ 2,500 μS/cm*	SC >2,500 μS/cm and ≤ 15,000 μS/cm*	SC >15,000 μS/cm*
Public & Private Water Supply	X	M	M, SC<7,000 μS/cm*	
Culinary & Food Processing	X	M	M, SC<7,000 μS/cm*	
Irrigation	X	X	M	
Stock Water	X	X	M	

Beneficial Uses	Water Use Classification			
	Class I	Class II	Class III	Class IV
	SC ≤ 1,000 μS/cm*	SC >1,000 μS/cm and ≤ 2,500 μS/cm*	SC >2,500 μS/cm and ≤ 15,000 μS/cm*	SC >15,000 μS/cm*
Commercial & Industrial Use	X	X	M	M

X = designated use to be fully supported; M=designated use to be at least marginally supported

* Specific Conductance @ 25°C

4.2 WATER QUALITY CRITERIA

Water quality criteria are established based on best available science to protect beneficial uses. Once adopted in Montana, criteria are called standards. Criteria, or standards, can be expressed as numeric pollutant concentrations or narrative statements. When standards are attained in a water body, the associated beneficial uses are considered to be supported by the parameter.

4.2.1 Numeric Standards

Numeric criteria reflect maximum pollutant concentrations that are allowed in a waterbody to still support the beneficial uses they are set to protect. Numeric criteria account for the magnitude (i.e., maximum allowable concentration), duration (i.e., length of exposure to the pollutant), and the frequency (i.e., how often the standard is exceeded). EPA develops national recommended water quality criteria (i.e., 304(a) criteria) which states may use as guidance when adopting water quality standards. States may also develop state- or site-specific standards. Once adopted, state water quality standards must be used for assessment of waterbodies or waterbody segments.

Montana has established numeric standards for:

- Five categories of pollutants affecting aquatic life, human health, or both: toxic, carcinogenic, radioactive, nutrients, and harmful (DEQ-7)
- Human health risks from *Escherichia coli* levels (ARM 17.30.620-629)
- Recreational impacts from excess algal biomass and nutrient levels in the Clark Fork River (ARM 17.30.631)
- Risks to agriculture and soils from excessive dissolved salts and types of salts—expressed as electrical conductivity and sodium absorption ratio—in the Powder, Tongue, Rosebud, and Little Powder rivers (ARM 17.30.670)

Pollutants with numeric standards may have acute aquatic life values, chronic aquatic life values, and/or human health values. Acute aquatic life standards are based on a one-hour exposure event and can only be exceeded once, on average, in a three-year period. Chronic aquatic life criteria are based on a 96-hour exposure and can only be exceeded, on average, once in a three-year period. Human health standards in DEQ-7 have a frequency and duration of zero and are expressed as “may not exceed.” For human health standards, two routes of exposure are considered: water consumption and fish consumption. Human health standards applicable to ground water generally only account for water consumption.

4.2.2 Narrative Standards

Narrative standards are statements (instead of specific quantities) that describe the desired conditions of a waterbody.¹³ Narrative criteria are adopted when a pollutant is not suited to adopting a numeric standard or if there is insufficient information to do so. Some narrative standards specify that waters must be “free from substances” that will create objectionable or nuisance conditions. Some narrative standards restrict allowable change from natural conditions, and other narrative standards specify acceptable ranges or degrees of change.

4.3 NONDEGRADATION POLICY

Montana’s nondegradation policy¹⁴ establishes that existing uses of state waters and the level of water quality necessary to protect those uses must be maintained and protected and, unless authorized, the quality of high-quality waters must be maintained. The requirements for what constitutes non-significant degradation and the conditions under which authorizations to degrade are allowed are described in ARM 17.30.701 through 718. Montana’s nondegradation policy provides three tiers of protection for surface waters (**Figure 3**).

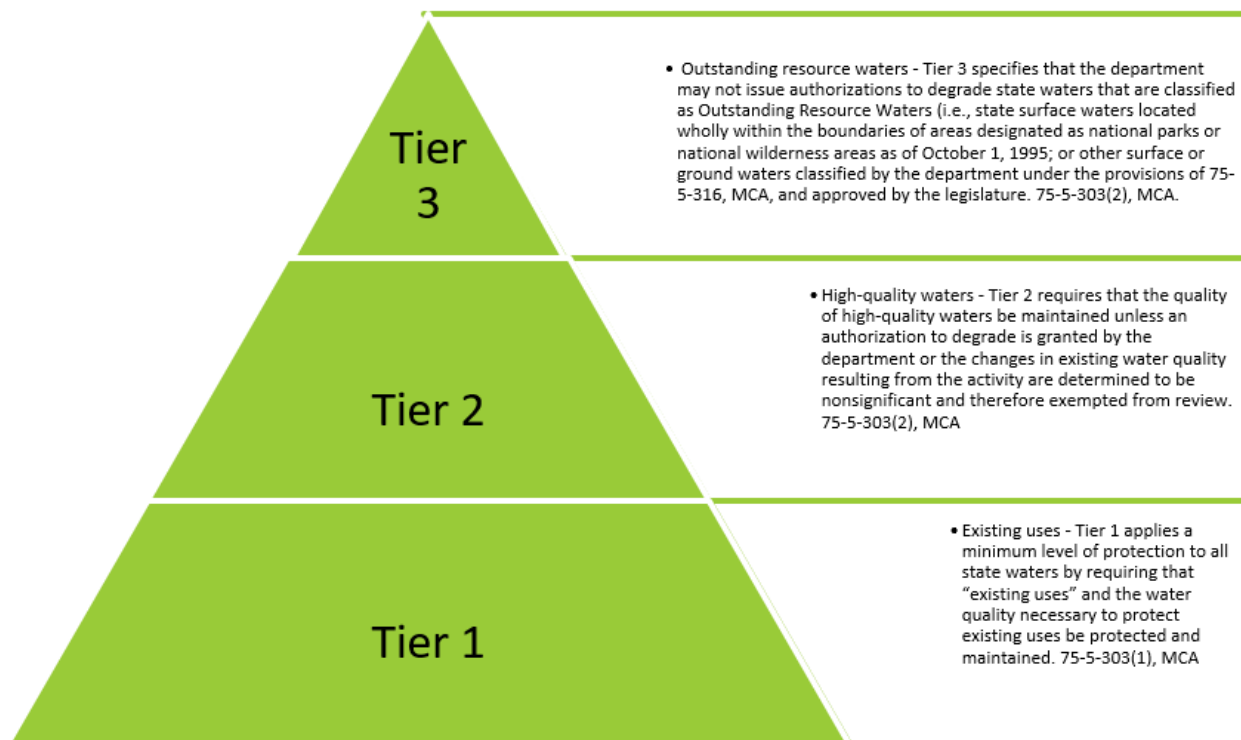


Figure 3. Montana’s Nondegradation Policy

5.0 SURFACE WATER MONITORING

DEQ conducts and supports monitoring across the state to develop appropriate standards, identify impairments, find and quantify sources for TMDLs, track change when improvements are made or new sources are developed, and report successful restoration of water quality conditions. DEQ's Monitoring and Assessment, Standards and Modelling, TMDL, Nonpoint Source and other programs, as well as many partners, collect data.

5.1 MONITORING TO SUPPORT WATERSHED PLANNING

DEQ conducts and supports water quality monitoring activities to achieve various objectives with the goal of protecting and improving water quality. Surface water quality data collected or funded by DEQ is managed in DEQ's water quality data system (MT-eWQX) and submitted to the [National Water Quality Portal](#) where it is publicly accessible. When DEQ funds projects via partnerships we ensure that data can be used for multiple purposes. DEQ will also use available data from other sources if it meets certain data quality objectives.

DEQ selects 303(d) assessment, TMDL, and success story projects via input from other DEQ programs, the Statewide TMDL Advisory Group, the biennial call for data and assessment, and through solicitation of external partners. Considerations for prioritizing many of the projects that need water quality data are provided in MCA 75-5-702(7).

Surface water monitoring projects undertaken by DEQ from 2019 - 2022 include:

- **Armells Creek:** track conditions in salinity, metal and nutrients
- **Canyon Ferry Reservoir:** determine nutrient conditions that would prevent nuisance and harmful algal blooms and to assess beneficial uses associated with nutrients
- **Clark Canyon Reservoir:** evaluate influence on internal turbidity production and effects to the Beaverhead River downstream
- **Clark Fork River:** analyze long-term nutrient trends
- **French Creek Watershed:** assess beneficial uses associated with sediment and habitat following restoration work
- **Kennedy Creek:** assess beneficial uses associated with metals, sediment, and habitat following restoration work
- **Lake Koocanusa tributaries:** evaluate selenium concentrations in tributaries to Lake Koocanusa
- **Lower Bitterroot River:** source assessment of lead
- **Manganese in Montana's Public Water Supplies:** understand the prevalence of manganese in public water supplies in high-risk areas, provide education to the public water systems and their customers about the health risks of manganese and what can be done to treat the water, and determine the best approach to keeping the public safe from the harmful effects of ingesting excess manganese
- **Middle Fork Judith River:** determine if water quality standards are met for sediment and to assess instream or riparian habitat conditions prior to any restoration actions
- **O'Brien Creek:** sediment and habitat beneficial use assessment
- **Reference sites on minimally disturbed streams:** expand data used to define reference conditions used, for example, when interpreting narrative water quality standards

- **Smith River:** investigate nuisance algae conditions, assess uses associated with nutrients and metals, and identify tributary loading
- **Statewide Metals Project:** collect Total Recoverable Aluminum and associated parameters as well as selenium to characterize concentrations across the state
- **Statewide Per- and Polyfluoroalkyl Substances (PFAS):** monitoring throughout the state to address the goals and objectives stated in Montana’s PFAS Action Plan and the Water Quality Planning Bureau’s PFAS Monitoring Project Quality Assurance Project Plan (QAPP)
- **Taylor Fork of the Gallatin River:** assess beneficial uses associated with sediment following restoration work
- **Upper Goat Creek:** assess beneficial uses associated with Total Suspended Solids (TSS) following improvement work
- **Upper Lolo watershed and Reimel Creek:** assess beneficial uses associated with sediment, fish passage, and streamside habitat following restoration work
- **Upper Missouri River:** assess beneficial uses associated with nutrient and metals conditions
- **Vandenberg Drain Ditch:** identify the appropriate uses of the waterbody
- **Yellowstone River:** assess beneficial uses associated with nutrient and metals conditions
- **Yellowstone River and Missouri River:** evaluate sources and concentrations of arsenic

5.1.1 Monitoring Partnerships

Monitoring partnerships increase the amount of high-quality data available for making informed decisions. Partnerships can also heighten efficiency, help leverage technical and financial resources, and enable stakeholders to engage directly in water resource management. For example, when assessing beneficial use support and making impairment decisions, DEQ considers data submitted from secondary sources if the data meets DEQ’s data quality requirements. **Table 4** shows examples of recent, successful monitoring partnerships.

Table 4. Monitoring Partnership Examples

Watershed	Objective	Partner(s)
Bitterroot River	Nutrient trends	Clark Fork Coalition and Bitterroot River Protection Association
Camas Creek	Study of post-fire effects on sediment-bound bioavailable phosphorus (Bio-P), turbidity, total phosphorus (TP), soluble reactive phosphorus (SRP), TSS, and suspended sediment (SS)	U.S. Geological Survey Wyoming-Montana Water Science Center
Clark Canyon Reservoir	Turbidity study	U.S. Bureau of Reclamation, Montana Fish, Wildlife & Parks
Clark Fork River	Nutrient trends	Clark Fork Coalition, University of Montana, and AVISTA
Clarks Fork of the Yellowstone River	Monitoring assistance and stakeholder engagement	Clarks Fork of the Yellowstone Partnership
Cow Creek	Riparian restoration and monitoring	Whitefish Lake Institute, Flathead Conservation District, Montana Fish Wildlife and Parks, the City of Whitefish, and Whitefish High School Project FREEFLOW
Deep Creek	National Water Quality Initiative	Natural Resources Conservation Service and Broadwater Conservation District
East Fork Armells Creek	Salinity, metals and nutrient trends	DEQ Coal Program
French Creek Watershed	Sediment monitoring	Big Hole Watershed Committee
Goat Creek	TSS and turbidity monitoring	DNRC
Lake Koocanusa	Selenium studies	U.S. Army Corps of Engineers, U.S. EPA, U.S. Geological Survey, and Montana Fish, Wildlife & Parks
Lower Gallatin River Watershed	Nutrient, TSS, macroinvertebrate, and E. coli trends	Gallatin Local Water Quality District
Prickly Pear Creek	Nutrients, metals, and E. coli monitoring	Lewis & Clark County Water Quality Protection District
Red Rock watershed	Beneficial use assessment relating to nutrient, E. coli, sediment and metals conditions	The Nature Conservancy
Reference Stream Project	Reference conditions	University of Montana, Bureau of Land Management
Smith River	Nutrient and algae study	U.S. Geological Survey, Montana Fish, Wildlife & Parks
Statewide	Selenium and PFAS monitoring	Montana Fish, Wildlife & Parks
Taylor Fork	Aquatic life use sediment assessment	Gallatin River Task Force
Upper Gallatin River	Nutrient and algae study	Gallatin River Task Force

5.1.2 Volunteer Monitoring Support

DEQ values volunteer monitoring efforts because they provide hands-on opportunities for people to learn about water quality and can produce high quality data. DEQ supports volunteer monitoring efforts across Montana by providing trainings, technical support, financial support for lab analyses, guidance resources, and lending monitoring equipment. **Tables 5 and 6**, as well as **Figure 4** shows volunteer monitoring programs that DEQ has supported in the past ten years through the Volunteer Monitoring Lab Analysis Support Program.

Forming partnerships with other entities in the state that also support volunteer monitoring is an important component to DEQ's volunteer monitoring support. DEQ works with Montana State University Extension Water Quality and Monitoring Montana Waters to support organizations across the state reach their water quality monitoring goals.

Table 5. Organizations who received funding from the Volunteer Monitoring Lab Analysis Support Program between 2015 and 2025.

Number in Figure 4	Organization	Watershed	County
1	Gallatin Watershed Council	East & Lower Gallatin	Gallatin
2	Teton River Watershed Group	Teton	Teton and Chouteau
3	Gallatin River Task Force	Upper Gallatin	Gallatin
4	Little Bitterroot Lake Association	Little Bitterroot Lake	Flathead
5	Madison Conservation District	Madison	Madison
6	Lake Helena Watershed Group	Lake Helena	Lewis & Clark
7	Smith River Habitat Project	Smith	Meagher
8	Sun River Watershed Group	Sun	Lewis & Clark, Teton, and Cascade
9	Upper Missouri Watershed Association	Upper Missouri	Broadwater, Lewis & Clark, and Cascade
10	Bitterroot River Protection Association	Bitterroot	Ravalli and Missoula
11	Carbon County Conservation District	Clarks Fork of the Yellowstone	Carbon and Yellowstone
12	Friends of Lake Mary Ronan	Lake Mary Ronan	Lake
13	Missoula Valley Water Quality District	Bitterroot and Middle Clark Fork	Missoula
14	Trout Unlimited	North Burnt Fork Creek	Ravalli
15	Yellowstone Ecological Research Center	Upper Yellowstone	Park
16	Big Hole River Foundation	Big Hole	Beaverhead
17	Big Hole Watershed Committee	Elkhorn Creek and Wise River	Beaverhead
18	Stillwater Valley Watershed Council	Stillwater	Stillwater
19	Clearwater Resource Council	Clearwater	Missoula
20	Gallatin Local Water Quality District	East & Lower Gallatin	Gallatin
21	Clarks Fork Yellowstone Partnership	Clarks Fork of the Yellowstone	Carbon and Yellowstone

Table 6. Organizations who received technical assistance outside of the Volunteer Monitoring Lab Analysis Support Program between 2020 and 2025.

Number in Figure 4	Organization	Watershed(s)	County
22	Adventure Scientist	Wild and Scenic Rivers	Multiple
23	Baker High School	Baker Lake	Fallon
24	Hill County Conservation District	Beaver and Big Sandy	Hill
25	Broadwater Conservation District	Deep Creek	Broadwater
26	Central Montana Resource Council	Ross Fork Creek	Fergus and Judith Basin
27	Carbon County Resource Council	Rock Creek	Carbon
28	The Salmonfly Project	Multiple	Multiple
29	Flathead Lakers	Flathead Lake	Flathead and Lake
30	Flathead Basin Commission	Flathead	Flathead and Lake
31	Flathead River Alliance	Flathead River	Flathead
32	Gallatin Conservation District	Gallatin	Gallatin
33	Gallatin Valley Land Trust	Gallatin	Gallatin
34	Lewis & Clark Water Quality District	Multiple	Lewis & Clark
35	The Blackfoot Challenge	Blackfoot	Lewis & Clark, Powell, and Missoula
36	Whitefish Lake Institute	Multiple	Flathead, Lake, and Lincoln
37	Bitterroot Water Partnership	Bitterroot	Ravalli
38	Watershed Education Network	Clark Fork	Missoula
39	Granite Headwaters Watershed Group	Flint-Rock	Granite

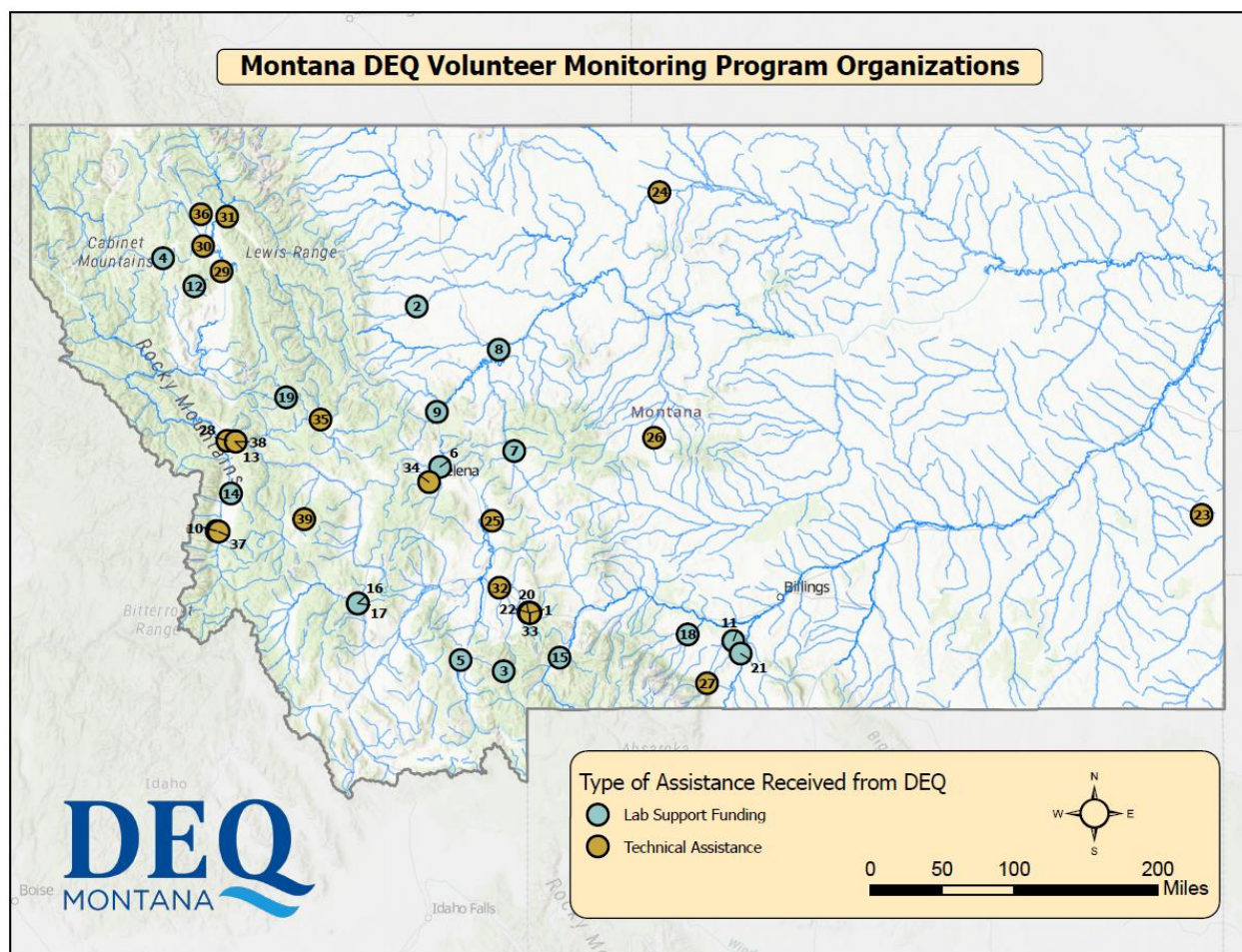


Figure 4. Volunteer Monitoring Program Organizations

5.2 NATIONAL AQUATIC RESOURCE SURVEYS

The EPA develops and manages the National Aquatic Resource Surveys (NARS) to assess the conditions of lakes and reservoirs, rivers and streams, and wetlands across the nation. Survey sample design provides a snapshot of the nation's waters and can compare results between states and from year to year. During each assessment EPA contracts with an environmental consultant to complete the monitoring in MT and provides MT DEQ the location of monitoring sites and monitoring procedures. MT DEQ completes analysis and uploads findings to the EPA's Assessment, Total Maximum Daily Load Tracking and Implementation System (ATTAINS). Assessment findings national wide and within MT can be found on <https://rconnect-public.epa.gov/armada/> and <https://mywaterway.epa.gov/>.

6.0 BENEFICIAL USE ASSESSMENT AND IMPAIRMENT LISTING

Water quality assessment evaluates whether water quality standards are met and determines if waters are fully supporting their designated beneficial uses (see **Section 4.1** for a description of beneficial uses).

A waterbody with sufficient credible data to show it is failing to achieve compliance with one or more applicable water quality standard is considered “impaired”.¹⁵ If a waterbody is deemed impaired it means one or more of its beneficial uses are limited or harmed to some extent. Based on the impairment listing outcome, each designated use for a waterbody is considered either:

- **Fully Supporting:** the waterbody meets all water quality standards and supports all assessed beneficial uses
- **Not Supporting:** one or more water quality standard is exceeded, limiting the assessed beneficial use to some extent
- **Threatened:** the waterbody currently meets water quality standards but will likely exceed a standard if current trends continue

For each impaired waterbody, DEQ identifies the probable pollutant or non-pollutant cause(s) of impairment as well as the probable sources contributing to the impairment of a specific use. Impairment listings may be changed when new sufficient credible data become available to support the modification.¹⁶ DEQ develops TMDLs for each waterbody-pollutant impairment and recommends pollution reduction strategies (see **Section 7.0** for more information on TMDLs).

Probable sources are identified in the Integrated Report to help assist the TMDL program during TMDL development and are not always verified as providing loads to the assessment unit. Additionally, not all sources are always identified in the Integrated Report because groundwater source pathways may not be apparent. As the next step in the water quality planning process, TMDLs identify all significant sources, quantify them, and provide allocations to reduce pollutant levels. A full and quantified source assessment will be completed during TMDL development.

6.1 ASSESSMENT PROCESS

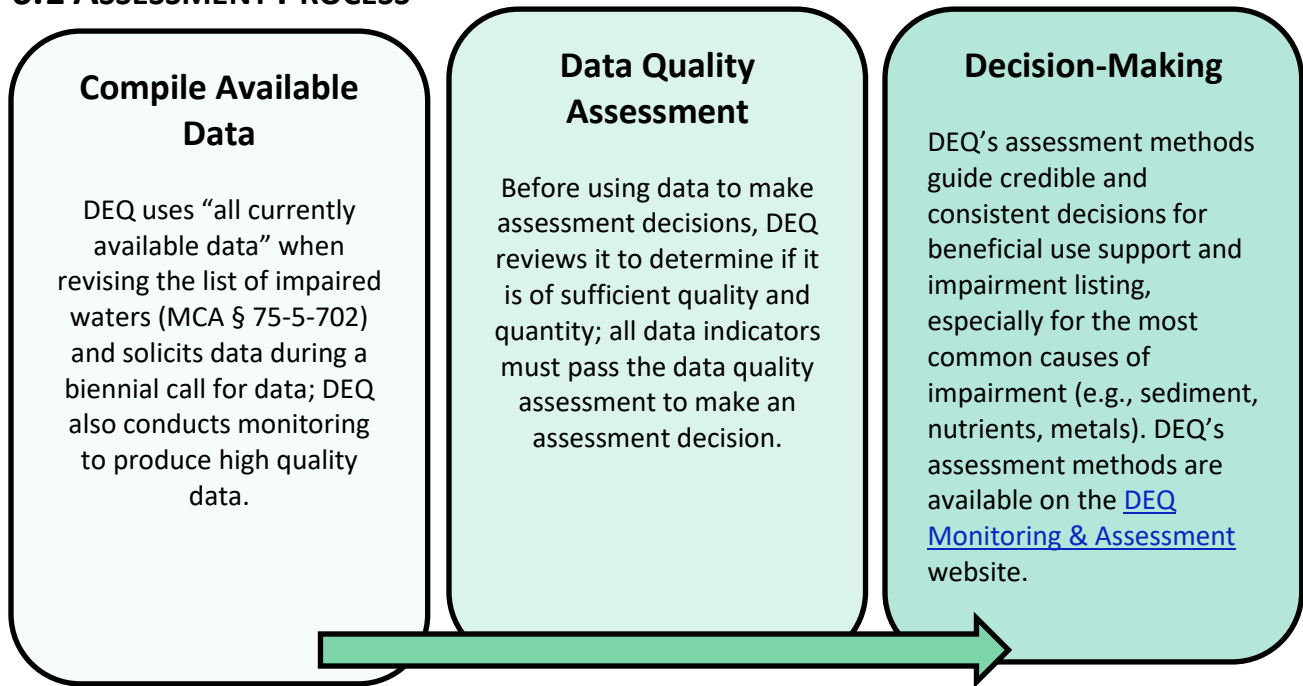


Figure 5. The Assessment Process

6.1.1 Assessment Priorities

DEQ prioritizes beneficial use assessment monitoring projects based on TMDL development priorities.¹⁷ After monitoring projects are selected DEQ may use a targeted risk-based watershed approach to systematically prioritize waterbodies for data collection within a project area. Targeted monitoring is used to reduce overall program costs and focus on watersheds that have the highest potential to benefit from restoration plans and TMDLs. Because the monitoring is targeted, overall statistical results about this program do not represent the average conditions across Montana. Additional areas may have readily available data from other programs. Requests for assessment of other data sources occurs during the biennial call for data in preparation for this report.

6.1.2 Assessment Units

Assessment units (AUs) are delineations of surface waters used to track water quality assessment results. AUs are the smallest unit of a waterbody for which a determination of water quality impairment is made. AUs may be an entire waterbody or a segment of a waterbody (e.g., a stream may be split into two or more segments such as headwaters to a tributary confluence and tributary confluence to mouth). One thousand two hundred seven AUs exist in the 2022-2024 cycle, including 1,135 river and stream AUs and 72 lake and reservoir AUs.

6.1.3 Water Quality Reporting Categories

Montana uses a system of reporting categories to summarize each assessment unit's impairment status:

Table 7. Water Quality Reporting Categories

Category	Description
1	All designated uses are supported, and no use is threatened.
1P	All designated uses are supported, no use is threatened, and a Protection Plan is in place.
2	Available data and/or information indicate that some, but not all, of the designated uses are supported.
3	There is insufficient available data/information to make a use support determination.
4A	Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL has been completed for the water-pollutant combination.
4C	Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed because the impairment or threat is not caused by a pollutant
5	One or more applicable beneficial uses are impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat.
5N	Natural conditions may be higher than the water quality standards but further source assessment is needed to fully determine this condition. The TMDL program completes more thorough source assessments for all pollutants identified as limiting a beneficial use. If natural sources are determined to be a sole cause of water quality standards exceedance during TMDL development, a natural conditions analysis may be pursued.

6.1.4 Assessment Records

For each waterbody assessment unit, DEQ maintains an electronic assessment record which summarizes data and information as well as beneficial use support and impairment listing decisions. Assessment records, online mapping tools, and Montana's Water Quality Integrated Report documents can be accessed on the [Clean Water Act Information Center \(CWAIC\) website](#). Here, queries can be run of the state's water quality assessment records. Water quality data may also be found at the EPA's [How's My Waterway webpage](#).

6.2 SUMMARY OF 2022-2024 WATER QUALITY ASSESSMENTS

Montana selects watersheds and large river systems across the state to implement beneficial use assessment projects and to help frame and inform TMDLs (**Section 7.0**). In addition to TMDL-based project areas, projects are implemented in specific waterbodies where water quality threats or improvements are occurring. Other waters are assessed on a case-by-case basis depending on known availability of data and responses during the biennial call for data.

As of the 2022-2024 cycle, Montana DEQ has assessed the water quality of 23,111 miles of rivers and streams and 521,088 acres of lakes, which account for 49% of the total length of Montana's perennial rivers and streams (excluding streams on tribal lands and ORWs) and 74% of lake acreage (excluding lakes on tribal lands and ORWs). See **Figure 6**, below, for a map of assessment units and the Integrated Reporting cycle they were last assessed. It is important to remember that monitoring is targeted and overall statistical results about this program do not represent the average conditions across Montana.

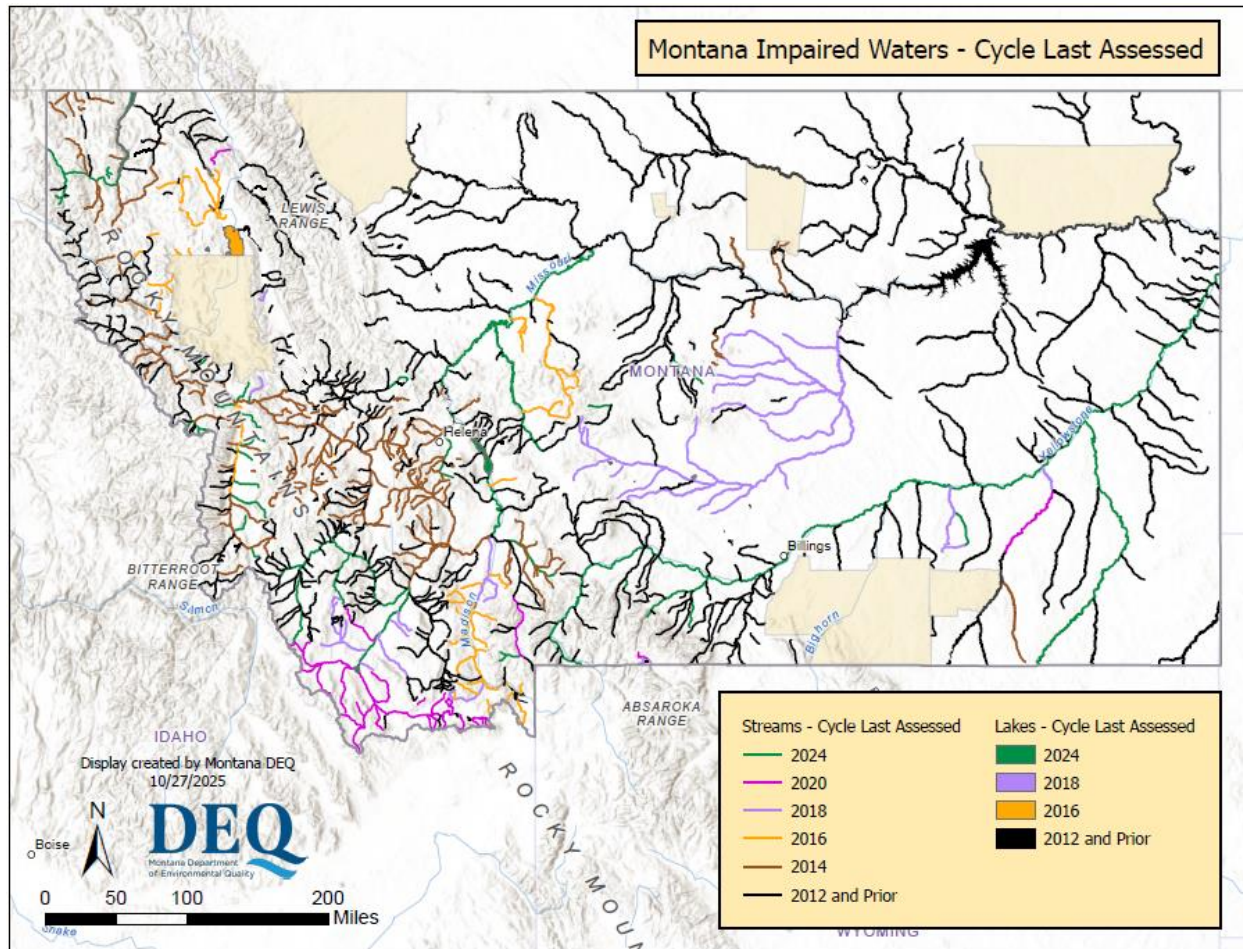


Figure 6. Integrated Reporting Cycle that Assessment Units were Last Assessed

6.2.1 Overview of Cause Groups and AU-Cause Listings

Sediment, habitat, metals, and nutrients are the most common cause groups impacting rivers (**Table 8**). Impaired lakes are overwhelmingly impacted by metals, particularly mercury.

Table 8. Common Causes and Cause Groups

Cause or Cause Group	Total River Mileage Impaired by Cause	% of Assessed River Miles that are Listed as Impaired by Cause	% of Total Perennial Rivers and Streams in Montana that are Impaired by Cause*	Total Lake Acreage Impaired by Cause	% of Assessed Lake Acres that are Listed as Impaired by Cause	% of Total Named Lakes 5 Acres or Larger in Montana that are Listed as Impaired by Cause*
Habitat (4C)	10,214	44%	22%	9,446	2%	1%
Sediment	8,309	36%	18%	10,948	2%	2%
Metals	8,126	35%	17%	392,131	75%	56%
Nutrients	7,625	33%	16%	115,155	22%	16%
Salinity	2,921	13%	6%	16,191	3%	2%
Temperature	2,717	12%	6%	0	0%	0%
Mercury	1,650	7%	4%	311,192	60%	44%
PCBs	75	0.32%	0.16%	60,622	12%	9%

* Excludes ORW and Tribal Waters

An AU-cause combination is a specific waterbody segment and its associated impairment cause listing. A total of 3,475 AU-cause combinations have been identified as impairing Montana's surface waters (**Appendix A**) as of the 2022-2024 cycle. This total includes both pollutants and non-pollutants. TMDLs have been completed for 1479 of the AU-pollutant combinations. A waterbody may have multiple causes harming its uses and not all causes require a TMDL. Montana's waters are impacted by 82 unique causes and 94 unique sources.

6.2.2 AU Categories

Of the 23,111 miles of assessed streams and rivers with use support determinations, 50% of miles or 386 AUs are listed as impaired (Category 5 or Category 5,5N), 21% of miles or 378 AUs are listed as impaired but with a completed TMDL (Category 4A), 4% of miles or 53 AUs are fully supporting assessed uses (some uses not assessed; category 2) and 9% of miles or 119 AUs are fully supporting all beneficial uses (Category 1). (See **Section 6.1.3** for category definitions; see **Figure 7** for details regarding all categories for assessed rivers and streams).

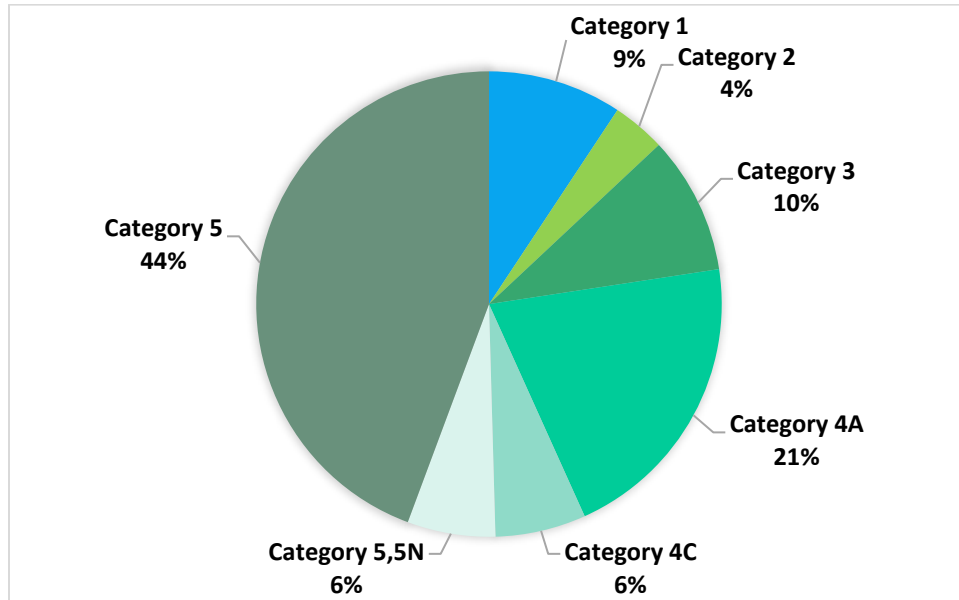


Figure 7. Percentage of AU Categories for Assessed Rivers

Of the 521,088 acres of lakes with use support determinations, 72% of acres or 20 AUs are listed as impaired (Category 5 or Category 5,5N), 1% of acres or 4 AUs are listed as impaired – TMDL completed (Category 4A), and 12% of acres or 15 AUs are fully supporting all beneficial uses (Category 1). (See **Section 6.1.3** for category definitions; see **Figure 8** for details regarding assessed lake categories.)

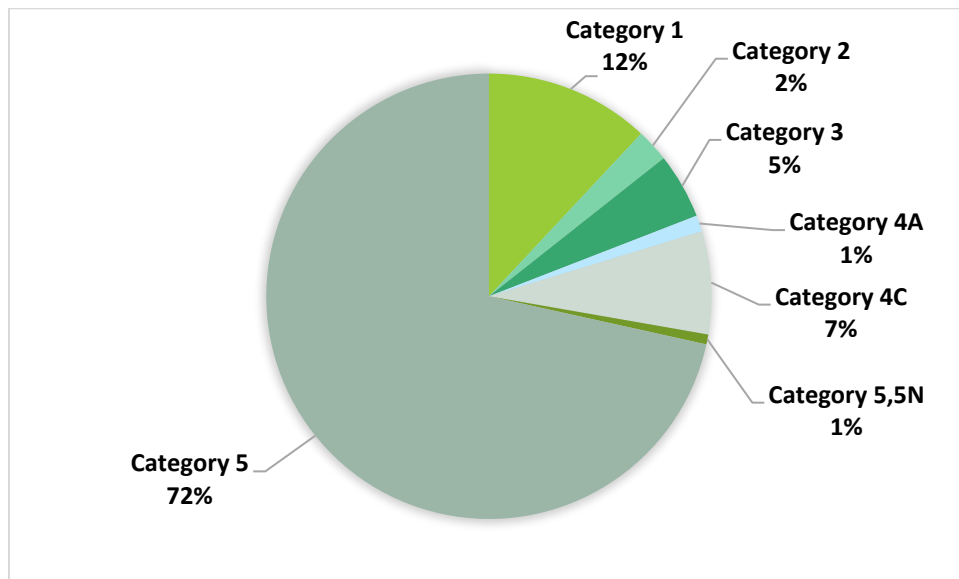


Figure 8. Percentage of AU Categories for Assessed Lakes

6.2.3 River and Stream Water Quality Assessment

Overall statistical results about this program do not represent the average conditions across Montana because monitoring is targeted. Targeted monitoring is used to reduce overall program costs and focus

on watersheds that have the highest potential to benefit from restoration plans and TMDLs. As stated in **Section 2.3**, above, there are 46,837 miles of perennial rivers and streams within the State’s jurisdiction and not in ORW areas meaning that 49% of the State’s river and stream miles have been assessed. Nevertheless, the following summary provides useful information about Montana’s waters.

Many of the common impairments in Montana affect aquatic life. DEQ has assessed 1,135 river and stream AUs, for a total of 23,111 miles. One hundred nineteen assessed river and stream AUs, or 2,152 miles, support all their uses. The most common causes impacting stream beneficial uses are alteration in stream-side or littoral vegetative cover, sedimentation/siltation, and flow regime modification (see **Table 9** for a list of the 10 most common causes impacting rivers and streams based on mileage). Agriculture (mainly irrigated crop production and grazing in riparian or shoreline zones), silviculture, and mining are the leading sources for these three causes.

Table 9. Ten Most Common Causes for Perennial Rivers and Streams Based on Mileage

Cause	# of Impacted AUs	Total Miles of Impacted Rivers and Streams	% of Assessed River and Stream Miles	% of Total Perennial Rivers and Streams in Montana*
Alteration in stream-side or littoral vegetative covers	413	8,774	38%	19%
Sedimentation/Siltation	453	7,208	31%	15%
Flow Regime Modification	298	6,397	28%	14%
Phosphorus, Total	247	5,349	23%	11%
Nitrogen, Total	213	5,066	22%	11%
Iron	141	4,487	19%	10%
Lead	173	3,731	16%	8%
Physical substrate habitat alterations	148	2,992	13%	6%
Copper	145	2,721	12%	6%
Temperature	104	2,717	12%	6%

* Excludes ORW and Tribal Waters

6.2.4 Lake Water Quality Assessment

To date, of the 699,458 acres of lakes and reservoirs under state jurisdiction (i.e., excluding waters located on tribal lands and ORWs), DEQ has defined 72 assessment units consisting of 521,088 acres. Fifteen assessed lakes fully support all uses, for a total of 62,380 acres. The five largest lakes (Fort Peck Reservoir, the portion of Flathead Lake under state jurisdiction, Canyon Ferry Reservoir, the portion of Lake Koocanusa located in the U.S., and Hungry Horse Reservoir) account for 72% of the assessed lakes acreage in Montana. Montana’s lakes are generally in good condition, with the lakes in the western mountainous region generally less disturbed than those in the northern plains. The overall water quality of the state’s lakes is better than the national average.¹⁸

As of 2024, 32 identified causes and 36 identified sources impact Montana's lakes and reservoirs. Mercury, lead and phosphorus are the most common causes by number of acres impacted. (See **Table 10** for a list of the 10 most common causes impacting lakes.) Of the 311,192 acres listed for mercury, Fort Peck Reservoir accounts for 233,296 acres, or 75% of acres. Although lead is the second most common cause, it only impacts three known lakes: Lake Helena, Medicine Lake, and Fort Peck Reservoir. Historic mining is a major source of lead contamination in these three lakes. The third most common pollutant is total phosphorus, which impacts 73,324 acres of assessed lakes. Agriculture and municipal point source discharges are the most common sources of total phosphorus in Montana's lakes. Excess phosphorus can cause filamentous algae growth and harmful algal blooms. DEQ's harmful algal bloom program is discussed in **Section 14.6**.

Table 10. Ten Most Common Causes for Lakes Based on Acreage

Cause	# of Impacted AUs	Total Acres of Impacted Lakes	% of Assessed Lake Acres	% of Total Named Lakes 5 Acres or Larger in Montana*
Mercury	6	311,192	60%	44%
Lead	3	245,101	47%	35%
Phosphorus, Total	7	73,324	14%	10%
Nitrogen, Total	5	68,354	13%	10%
Polychlorinated Biphenyls (PCBs)	2	60,622	12%	9%
Flow Regime Modification	8	51,859	10%	7%
Selenium	6	42,271	8%	6%
Arsenic	5	41,858	8%	6%
Excess Algal Growth	4	41,831	8%	6%
Ammonia, Un-ionized	1	32,810	6%	5%

* Excludes ORW and Tribal Waters

6.2.4.1 Trophic Status

Trophic status is used to classify the biological productivity in lakes.¹⁹ Although DEQ has limited data to evaluate the trophic status of lakes in the state, 57 lakes (505,750 acres) have been evaluated. See **Figure 9** for details. Oligotrophic lakes have low rates of biological productivity and low nutrient concentrations. Eutrophic lakes have high nutrient levels and high biological productivity. Mesotrophic lakes fall in between oligotrophic and eutrophic. Hypereutrophic lakes have very high concentrations of nutrients and high primary productivity but low species diversity. Lakes with high organic matter and low productivity and low nutrients are called dystrophic lakes.²⁰

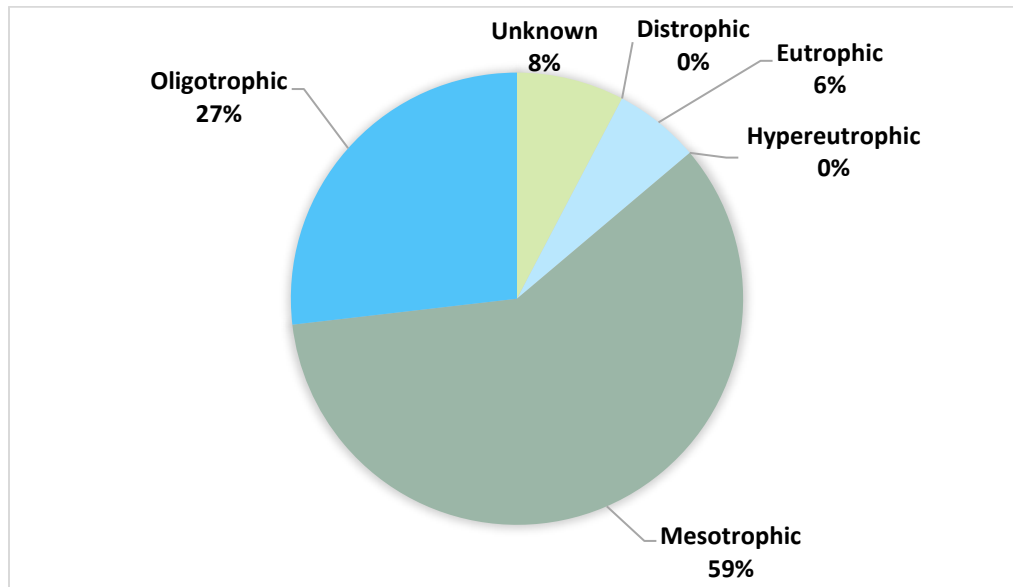


Figure 9. Trophic Status of Lakes by Percentage of Total AU Acres

6.2.5 2022-2024 Monitoring and Assessment Results

The 2022-2024 IR provides an update to the 2020 IR. Not all waters are reassessed every reporting cycle. DEQ assessed 78 river and stream segments and four lakes during the 2022-2024 cycle. A summary of the assessed waters is listed in **Table 11**.

Table 11. Summary of Assessed AUs during the 2022-2024 Cycle

TMDL Planning Area	Watershed	# of AUs Assessed
Beaverhead	Beaverhead	2
Lower Big Hole	Big Hole	1
Middle Big Hole	Big Hole	4
North Fork Big Hole	Big Hole	1
Upper Big Hole	Big Hole	1
Bitterroot	Bitterroot	8
Bitterroot Headwaters	Bitterroot	1
Upper Lolo	Bitterroot	3
Blackfoot Headwaters	Blackfoot	3
Flathead Lake	Flathead Lake	1
Lower Gallatin	Gallatin	4

TMDL Planning Area	Watershed	# of AUs Assessed
Upper Gallatin	Gallatin	2
Big Springs	Judith	2
Judith - Arrow	Judith	1
Middle Yellowstone Tributaries	Lower Yellowstone-Sunday	1
Middle Clark Fork Tributaries	Middle Clark Fork	1
Ninemile	Middle Clark Fork	1
Kootenai	Middle Kootenai	8
Powder	Powder	3
Red Rock	Red Rock	1
Lake Helena	Upper Missouri	5
Missouri River	Upper Missouri	10
Smith	Upper Missouri	2
Boulder - Big Timber	Upper Yellowstone	2
Stillwater - Columbus	Upper Yellowstone	3
Yellowstone River	Yellowstone	11

6.2.5.1 Category 5 Pollutant Delistings and Listings

During the 2022-2024 cycle, 115 pollutant causes on 72 waterbodies were delisted (i.e., removed) from the 2020 303(d) List (**Table 12**). For the complete list, see **Appendix D**. Of the delisted pollutant causes 80 were delisted due to an approved TMDL (4A), 34 were delisted for achieving water quality standards, and one cause was delisted due to data and/or information lacking to determine WQ status; original basis for listing was incorrect. See **Section 8.1** for success story details.

Table 12. Number of Pollutant Causes Delisted from 2020 303(d) List (Category 5)

2022-2024 Delisting Category	Delisting Reason	# of Delistings
Category 1	Applicable WQS attained due to restoration activities	12
Category 1	Applicable WQS attained; based on new data	22
Category 1	Data and/or information lacking to determine WQ status; original basis for listing was incorrect	1
Category 4A	TMDL approved or established by EPA (4A)	80
Total Delisted Pollutant Causes		115

Seventy-seven new causes were listed on 42 rivers and streams and one lake during the 2022-2024 cycle (**Table 13**). Sixty-one excess algal growth listings are replacements for algae and chlorophyll-a listings on 57 rivers and streams and four lakes due to refinement of listing cause terminology.

Table 13. Pollutant Causes Listed During the 2022-2024 Cycle

Cause	# of AUs with Cause*
Aluminum	3

Cause	# of AUs with Cause*
Ammonia	1
Arsenic (As)	8
Asbestos	3
Copper (Cu)	4
Iron (Fe)	19
Lead (Pb)	10
Manganese (Mn)	2
pH	25
Sedimentation/Siltation	1
Zinc	1
Excess Algal Growth	61
Total Causes Listed During the 2022-2024 Cycle	138

* These causes are listed on 104 AUs

7.0 TOTAL MAXIMUM DAILY LOADS (TMDLs)

The [DEQ TMDL website](#) contains a list of Montana’s TMDL priority areas and houses Montana’s completed TMDL documents and TMDL implementation evaluations.

7.1 WHAT ARE TMDLS

DEQ develops TMDLs for impaired and threatened waterbodies. A total maximum daily load (TMDL) is a calculation of the maximum amount of a pollutant a waterbody can receive from all sources combined and still meet its water quality standards (i.e., support its beneficial uses). TMDLs allocate the allowable load of the pollutant among both point and nonpoint sources, while also accounting for naturally-occurring conditions that can diminish water quality. In addition, TMDLs must consider the uncertainty in predicting how well reducing a pollutant will result in meeting water quality standards. The TMDL calculation also considers seasonal variations, such as water temperature and water flow, which can affect how waterbodies respond to certain pollutants. In addition to containing TMDL calculations, a TMDL document contains a plan to restore and protect water quality. TMDLs are not required for non-pollutant causes of impairment (e.g., habitat alterations).

7.2 TMDL DEVELOPMENT

Developing a TMDL for an impaired waterbody is a problem-solving exercise. The problem is excess pollutants entering a waterbody and impairing or threatening beneficial uses. The solution is to identify three factors:

- the total acceptable pollutant loading (the TMDL or allowable amount of loading)
- all the significant pollutant-contributing sources (where the pollutant comes from)
- where pollutant-loadings can be reduced to achieve an acceptable load (reductions to achieve the water quality goals)

TMDLs are completed for each waterbody-pollutant combination. A single waterbody can be impaired or threatened from multiple pollutants, which means it may require multiple TMDLs. For example, if one stream segment is impaired by sediment, copper, and iron, that segment has three waterbody-pollutant combinations that must be addressed by three separate TMDLs. DEQ generally uses a watershed approach to develop TMDLs so that rivers, streams, and lakes within a watershed can be efficiently addressed in a single TMDL document containing multiple TMDLs. TMDLs set water quality targets for watersheds and therefore provide both a way to measure water quality and a plan for improving it.

DEQ works with watershed stakeholders during TMDL development so that local watershed groups and/or other interested parties can use completed TMDLs as tools to help guide local activities for improving water quality.

Benefits of a “watershed approach” for TMDLs:

- An integrated approach involving watershed stakeholders and experts
- Allows multiple pollutant groups and waterbodies to be addressed at once
- A cumulative look at watershed health taking the full watershed into account for source assessment

Developing a TMDL document generally takes 2 to 3 years for each project area, depending on the complexity of the watershed and available data and resources. DEQ has several project areas in TMDL development simultaneously (see [Montana's Watershed Plan Viewer](#)). After local stakeholders and the public have the opportunity to provide comment, TMDL documents are submitted to the U.S. EPA for approval.

7.3 TMDL PRIORITIES

To determine a watershed's TMDL development priority, DEQ applies factors defined in state law (75-5-702(7), Montana Code Annotated) and consults with the Statewide TMDL Advisory Group. TMDL priority levels:

- **High Priority:** TMDL completion anticipated within the next two years
- **Medium Priority:** TMDL completion anticipated within 2 to 6 years
- **Low Priority:** TMDL completion anticipated beyond 6 years or waters that have a TMDL advance restoration plan in place

Factors that most influence prioritization:

- Is a TMDL needed to support a new, individual discharge permit application?
- How great is the potential for implementation?
- Is there a great ability to improve coordination among water quality programs?
- Do the waters have a high resource value?
- Do the pollutants have high potential to harm a beneficial use or uses?

Montana's TMDL Prioritization Framework and rationale for Montana's current TMDL priority areas can be found on the [TMDL Program](#) page on the DEQ website. Because of the large number of existing TMDL documents, in addition to working on new TMDL development in priority areas, it is anticipated that a significant amount of future work will address updates and improvements to these documents, with regard to local stakeholder implementation.

7.4 TMDL IMPLEMENTATION

TMDLs are implemented by people, and TMDL documents often function as information tools. Individual pollutant allocations for point sources (referred to as wasteload allocations) are managed using discharge permits, which DEQ issues through the Montana Pollutant Discharge Elimination System (MPDES). Pollutant allocations for nonpoint sources (referred to as load allocations) are primarily managed voluntarily by land management agencies, watershed groups, conservation districts, landowners, and interested citizens. DEQ assists locally led restoration and protection efforts with funding and technical assistance to improve water quality through the Nonpoint Source Program (see **Section 8.0**). DEQ will revisit areas with completed TMDLs to document progress made toward meeting TMDL objectives, also known as a TMDL implementation evaluations (TIEs). The purpose of a TIE is to:

- Recognize and document implementation of reasonable land, soil, and water conservation practices
- Assist in determining the effectiveness of those practices on water quality improvement
- Evaluate progress towards meeting water quality standards
- Provide recommendations for changes in implementation activities, monitoring, or address changes in the watershed that are likely to impact water quality
- Promote TMDL implementation and beneficial use support

Please view [Montana's Watershed Plan Viewer](#) for a map of completed TMDL implementation evaluations.

8.0 WATERSHED PROTECTION AND RESTORATION (NONPOINT SOURCE AND WETLANDS SECTION)

The Nonpoint Source and Wetlands Section focuses on protecting and restoring water quality from nonpoint sources of pollution throughout the state by implementing the Nonpoint Source Management Plan. Montana submitted an updated plan in December of 2017, which EPA Region 8 approved in February 2018. This plan discusses the development of a 20-year strategic vision that articulates a process for identifying and supporting Focus Watersheds. In conjunction with DEQ's closely aligned Monitoring and Assessment and Total Maximum Daily Load programs, the Water Quality Division finalized strategic visions for these three programs in August 2019.

The Nonpoint Source and Wetlands Section Strategic Plan to Improve Water Quality identifies four objectives:

1. Implement a tiered approach to tailor technical and financial support to the needs and capacities of watersheds
2. Demonstrate water quality improvements;
3. Build local capacity and partnerships
4. Improve stewardship and highlight achievements. The tiered approach recognizes three priority levels: Focus watersheds; Watersheds with Watershed Restoration Plans (WRPs); and Watersheds without WRPs. Focus watershed (1-2 active at any point in time) attributes include:
 - Locally-developed Watershed Restoration Plans (WRPs) in place
 - Stakeholder interest
 - Opportunities to track changes in water quality and other indicators
 - Cost-effective BMPs can remedy most NPS pollution
 - Existing partnership with DEQ and ability to increase momentum
 - Potential to reduce a community's point source treatment costs
 - Coinciding priorities with programs internal and external to DEQ

The [Montana Watershed Plan Viewer](#) is an interactive system that can be used to find WRP project areas.

The NPS Program's objective is to build capacity in those watersheds with Watershed Restoration Plans, such that they will at some point become a focus watershed, and, to support those watersheds without WRPs in meeting their NPS interests through assistance with WRP development, identifying other agency funding opportunities, and support for education and outreach including mini-grant opportunities, etc.

DEQ selected the Bitterroot and Lower Gallatin as the focus watersheds for 2019-2022 and 2023-2025 respectively. In January 2025, DEQ announced the Shields as the Nonpoint Source and Wetland's Section focus watershed for 2026-2028. The Camp and Godfrey and lower Shields watersheds are current Natural Resources Conservation Service National Water Quality Initiative watersheds. As such, those watersheds remain eligible for Nonpoint Source and Wetlands Section focus watershed technical resources and funding. The Nonpoint Source and Wetlands Section's focus watersheds have the potential to receive up to half the program's technical and financial resources.²¹

8.1 SUCCESSES: POLLUTION RESTORATION

DEQ works in coordination with local groups in planning and completing restoration work. Pollutant causes delisted during the 2022-2024 cycle due to restoration activity are listed in **Table 14**.

As one example, during the 2022-2024 cycle, DEQ confirmed restored water quality due to restoration activities on East Fork Lolo, Lost Park, and Granite Creek—tributaries in the Upper Lolo Watershed. Project partners including the Clark Fork Coalition and the Lolo National Forest successfully delisted these waterbodies for their fish passage barrier and streamside habitat impairments. While more restoration and time is needed to address the remaining sediment impairments, this success story represents decades of work and over \$1,000,000 in §319 funding alone.

Table 14. Causes Delisted Due to Restoration Activity

AUID	Waterbody Name	Delisted Cause Name
MT76F002_040	BEARTRAP CREEK, Mike Horse Creek to Mouth	Cadmium
MT76F002_040	BEARTRAP CREEK, Mike Horse Creek to Mouth	Copper
MT76F002_040	BEARTRAP CREEK, Mike Horse Creek to Mouth	Iron
MT76F002_040	BEARTRAP CREEK, Mike Horse Creek to Mouth	Lead
MT76F002_040	BEARTRAP CREEK, Mike Horse Creek to Mouth	Manganese
MT76F001_010	BLACKFOOT RIVER, Headwaters to Landers Fork	Cadmium
MT76F001_010	BLACKFOOT RIVER, Headwaters to Landers Fork	Iron
MT41H005_030	CACHE CREEK, headwaters to mouth (Taylor Fork)	Alteration in stream-side or littoral vegetative covers
MT76H005_040	EAST FORK LOLO CREEK, headwaters to mouth (Confluence with Lolo Creek)	Fish Passage Barrier
MT41D003_220	ELKHORN CREEK, headwaters to mouth (Jacobson Creek)	Arsenic
MT41D003_220	ELKHORN CREEK, headwaters to mouth (Jacobson Creek)	Lead
MT76H005_030	GRANITE CREEK, headwaters to mouth (Lolo Creek)	Fish Passage Barrier
MT76M004_070	KENNEDY CREEK, headwaters to mouth (Ninemile Creek)	Mercury
MT76H005_060	LOST PARK CREEK, headwaters to mouth (Confluence with East Fork Lolo Creek)	Fish Passage Barrier
MT76F003_010	MIKE HORSE CREEK, Headwaters to Mouth	Dissolved Aluminum
MT76F003_010	MIKE HORSE CREEK, Headwaters to Mouth	Iron
MT76F003_010	MIKE HORSE CREEK, Headwaters to Mouth	Lead
MT76F003_010	MIKE HORSE CREEK, Headwaters to Mouth	Manganese
MT41I006_060	PRICKLY PEAR CREEK, headwaters to Spring Creek	Lead
MT41H005_020	TAYLOR FORK, Lee Metcalf Wilderness boundary to mouth (Gallatin River)	Physical substrate habitat alterations
MT41H005_020	TAYLOR FORK, Lee Metcalf Wilderness boundary to mouth (Gallatin River)	Sedimentation/Siltation

9.0 WETLANDS

Montana’s overarching wetland goal is no net loss of the state’s remaining wetland resource base (as of 1989) and an overall increase in the quality and quantity of wetlands. To assist in that goal, DEQ’s Wetland Program provides state leadership to the Montana Wetland Council whose participants work to conserve wetlands and riparian areas for the benefits they provide, including improving water quality by filtering pollutants, maintaining water quantity, providing important habitat, and reducing the detrimental effects of flooding. The Wetland Program is dedicated to integrating wetlands into the water quality planning process, understanding wetland losses and gains in both quantity and quality, increasing the protections afforded wetlands and riparian areas, and evaluating the effectiveness of ongoing restoration and management.

The details of DEQ’s Wetland Program can be found in the [2020-2030 Montana DEQ Wetland Program Plan](#).

9.1 WHAT THE WETLAND PROGRAM DOES FOR MONTANA

- Organizes and chairs the Montana Wetland Council
- Works to integrate wetlands into the water quality planning process
- Participates in state working group to ensure compensatory mitigation for impacts to aquatic resources
- Conducts assessments to understand the affect land-use/water practices have on the benefits wetlands provide

9.2 PRIORITIES

- Engaging current and new Montana Wetland Council members
- Analysis and reporting on the Red Rock Watershed Wetland Assessments
- Incorporating wetland program goals and objectives into the 20-year strategic plans for NPS, Water Quality Monitoring and Assessment (WQMAS) and TMDL programs
- Increasing the capacity of the Department to better protect wetlands

9.3 ACHIEVEMENTS

- Planning and implementation of 319 funded Smith Sage Springs restoration project in partnership with the Big Hole Watershed Committee.
- Developed and implemented wetland restoration effectiveness monitoring to better understand the ability of wetland restoration to reduce pollutant loading to receiving waters.
- Provided training opportunities to tribal partners on wetland delineations. Published the Montana Wetland Council’s Strategic Framework for 2020 – 2030.
- Continue to lead the Montana Wetland Council

10.0 GROUNDWATER

Montana's population relies heavily on groundwater. About 60% of the state's drinking water withdrawals (million gallons per day, mgpd) come from groundwater.²² In addition to DEQ, other state and federal agencies that monitor and assess Montana's groundwater include:

- Montana Bureau of Mines and Geology (MBMG)
- Montana Department of Agriculture (MDA)
- Montana Department of Natural Resources & Conservation (DNRC)
- United States Geological Survey (USGS)

10.1 GROUNDWATER USES

Montanans withdraw approximately 205 mgpd of groundwater.²³ The groundwater withdrawals by category are:

- public supply – 83.3 mgpd
- irrigation – 59.6 mgpd
- domestic – 22.6 mgpd
- mining – 17.36 mgpd
- livestock – 12.3 mgpd
- industrial – 5.22 mgpd
- aquaculture – 3.49 mgpd
- thermoelectric – 0.80 mgpd

Groundwater use is highest in western Montana, where the predominant uses are domestic and irrigation supported by high-yield aquifers. Use for livestock is common throughout Montana but is most prevalent in eastern counties, where ranching is an important industry.

Between July 1, 2020, and June 30, 2022, 7,123 domestic wells, 911 livestock wells and 294 irrigation wells were drilled.²⁴ Since 1975, Montanans have constructed more than 126,843 domestic wells, 15,775 livestock wells, and about 7,250 irrigation wells.²⁵

10.2 GROUNDWATER MONITORING & ASSESSMENT

The 1991 Montana Legislature established the Montana Groundwater Assessment Program (GWAP),²⁶ directing the Montana Bureau of Mines and Geology (MBMG) to characterize Montana's hydrogeology and to monitor long-term water level conditions and water chemistry. In 2009, the Montana Legislature established the Groundwater Investigation Program (GWIP) within MBMG to conduct detailed groundwater investigations in areas with the most serious concerns.²⁷ The Groundwater Information Center (GWIC) <http://mbmggwic.mtech.edu> maintains and distributes data generated by the assessment, investigations, and monitoring programs as well as data generated by many other groundwater projects.

10.3 CONTAMINANTS & SOURCES

The water chemistry data evaluated for this report were collected by the groundwater monitoring, assessment, and investigation program and other MBMG programs within specific study areas (121 samples).²⁸ Of the 121 samples evaluated for this report, 40 % came from unconsolidated aquifers (Figure 10).

Data included in this report are from 2017-2019. To be included in the dataset for this report, the water quality sample must:

- have been collected between July 1, 2017, and June 30, 2019
- have an identifiable geologic source and represent “ambient” water quality (i.e., not collected as part of an effort to determine the extent of contamination by the evaluated parameter)
- have come from a well or spring

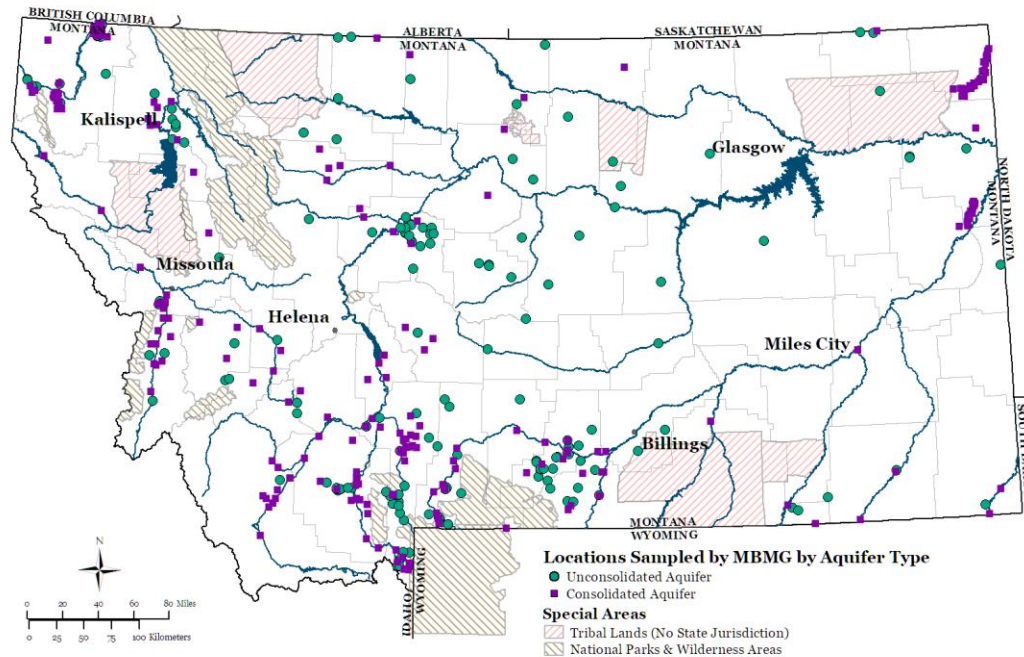


Figure 10. MBMG Sampling Locations by Aquifer Type

Montana Bureau of Mines and Geology evaluates groundwater quality for various parameters using established maximum contaminant levels (MCLs), secondary maximum contaminant levels (SMCLs), or DEQ adopted standards (Circular DEQ-7). Groundwater is tested by aquifer type for the contaminants listed in **Table 15**.

Table 15. Groundwater Contaminants

Pollutant	Number of Samples	Standard	Source	% of Samples over Standard	% Unconsolidated Aquifer	% Consolidated Aquifer
TDS	491	500 mg/L	SMCL	32%	28%	38%
Nitrate	491	10 mg/L	MCL	2%	2%	3%
Fluoride	491	4 mg/L	MCL	3%	1%	6%
Sulfate	491	250 mg/L	SMCL	15%	13%	20%
Chloride	491	250 mg/L	SMCL	1%	0%	2%
Aluminum	491	50 ug/L	SMCL	1%	1%	2%
Antimony	491	6 ug/L	MCL	0%	0%	0%
Arsenic	491	10 ug/L	MCL	8%	8%	9%
Barium	491	1000 ug/L	DEQ-7	1%	0%	3%
Beryllium	491	4 ug/L	MCL	0%	0%	0%
Cadmium	491	5 ug/L	MCL	0%	0%	0%
Chromium	491	100 ug/L	MCL	0%	0%	0%
Cooper	491	1300 ug/L	MCL	0%	0%	0%
Lead	491	15 ug/L	MCL	0%	0%	0%
Nickel	491	100 ug/L	DEQ-7	0%	0%	1%
Selenium	491	50 ug/L	MCL	1%	0%	1%
Silver	491	100 ug/L	DEQ-7	0%	0%	0%
Strontium	491	4000 ug/L	DEQ-7	2%	1%	4%
Thallium	491	2 ug/L	MCL	0%	0%	0%
Uranium	491	30 ug/L	MCL	1%	1%	2%
Zinc	491	2000 ug/L	DEQ-7	0%	0%	0%
Iron	491	0.3 mg/L	SMCL	12%	14%	10%
Manganese	491	0.05 mg/L	SMCL	22%	26%	15%

10.4 GROUNDWATER MANAGEMENT STRATEGY

DEQ educates the public and raises awareness about groundwater protection. Groundwater supplies the drinking water for most public and private users in Montana. Contaminated groundwater is difficult to remediate. The rate and scale of groundwater degradation is increasing due to increased septic system use and increased agricultural groundwater use. Irrigation can potentially reduce groundwater recharge, while causing fertilizers, pesticides, and animal wastes to leach into the groundwater.

10.4.1 Protection

As part of their daily business, several DEQ bureaus and other state agencies address many of the protection strategies laid out in the Montana Groundwater Plan.²⁹ Multiple agencies are responsible for implementing various groundwater protection strategies.

The 1989 Montana Agricultural Chemical Groundwater Protection Act³⁰ identifies the Montana Department of Agriculture (MDA) as responsible for the preparation, implementation, and enforcement of agricultural chemical groundwater management plans, providing public education, and conducting groundwater monitoring. Under the Montana Agricultural Chemical Groundwater Protection Act (MACGWPA), the MDA and DEQ have a Memorandum of Understanding (MOU). The MOU establishes the procedures each department will follow in the administration of the MACGWPA, 80-15-101, et seq., MCA. MDA and DEQ will cooperate in the development, implementation, and management of the MACGWPA.³¹

10.4.2 Groundwater Monitoring & Education

MDA conducts ambient groundwater monitoring for agricultural chemicals through a state-wide permanent monitoring network. If agricultural chemicals are found in groundwater, they will verify, investigate, and determine an appropriate response. Their education program offers initial and re-certification training for applicators of commercial and government pesticides. They also provide or assist in training and educating the public about pesticides.

10.4.3 Statewide Groundwater Pesticide Projects

MDA's Groundwater Protection Program conducts both statewide monitoring and regional-scaled special projects. Statewide monitoring is conducted at established permanent monitoring well locations while special projects sites are selected based on agricultural setting, soil type, groundwater table, and sampling access of the wells. These projects provide a snapshot of pesticide and nitrate levels in groundwater and are used to correlate land use patterns with groundwater pesticide and nitrate concentrations.

10.4.4 Groundwater Enforcement Program

MDA is responsible for primary enforcement of the Montana Agriculture Chemical Groundwater Protection Act while DEQ is responsible for adopting water quality standards for agricultural chemicals (pesticides and fertilizers). MDA ensures compliance by conducting statewide comprehensive inspections of agricultural chemical users, dealers, and manufacturers; by collecting groundwater and soil samples, and by investigating and monitoring incidents and spills that could harm groundwater. When necessary, MDA implements compliance actions and orders to prevent or remediate problems in groundwater associated with agricultural chemicals.

10.4.5 Remediation

In order to protect human health and the environment; prevent exposure to hazardous or harmful substances released into soil, sediment, surface water, or groundwater; and to ensure compliance with applicable state and federal regulations, DEQ's Remediation Program oversees:

- Investigation and cleanup of groundwater at state and federal Superfund sites
- Implementation of corrective actions for leaking underground storage tanks
- Reclamation of abandoned mines
- Remediation of groundwater contaminated by agricultural and industrial chemicals

Currently, the Groundwater Remediation Program is actively working on 72 sites, coordinating pesticide remediation activities with the Montana Department of Agriculture. The number of active sites varies between 70-90.³²

11.0 PUBLIC WATER SUPPLY

DEQ regulates approximately 2,315 public water systems in Montana. Public water systems can be community (e.g., towns), non-transient non-community (e.g., schools, camps, or other businesses), or transient non-community systems (e.g., rest stops or parks). The total population served by Community and Non-Transient Non-Community systems is 886,034. Collectively all public water supplies serve a population of 1,098,544.³³

Most water systems comply with regulations. Typically, violations are a result of facility owners being late to report required water sampling or failing to conduct required sampling. During 2019 and 2022, such incidences accounted for most significant public water system violations, along with occurrences of coliform bacteria, disinfectant and disinfection by-products, and nitrate contamination.³⁴ Ninety-seven percent of Montana's population is served compliant water. Only 3% of systems in violation of regulations required enforcement action. This number has remained relatively low over the past years. Overall, there has been a decrease in monitoring and reporting violations partly due to the implementation of an automated phone and email reminder services, stakeholder automated reports and public facing PWSB monitoring dashboards. Public health concerns and contamination are addressed through technical assistance and, if needed, formal enforcement actions. Compliance assistance is provided through on-site visits, phone and/or email. Information on sampling requirements and many other guidance is available to systems and the public on the DEQ website. An annual compliance report lists and explains the number of Safe Drinking Water Act requirement violations according to drinking water standards, water treatment requirements, or a water quality monitoring/reporting requirement and is available on the [DEQ Drinking Water Program website](#).

11.1 SURFACE WATER SYSTEMS

Montana has 257 public water systems that use surface water as a primary or secondary source (**Figure 11**). Of these systems, 192 are purchased; that is, they rely on other water systems for their primary or supplemental supply of water. For regulatory purposes, groundwater under direct influence of surface water (GWUDISW) systems are considered surface waters. Montana has seven such systems. Two of Montana's large public water systems use surface water as a source.³⁵ Montana has seven such systems. Two of Montana's large public water systems use surface water as a source.

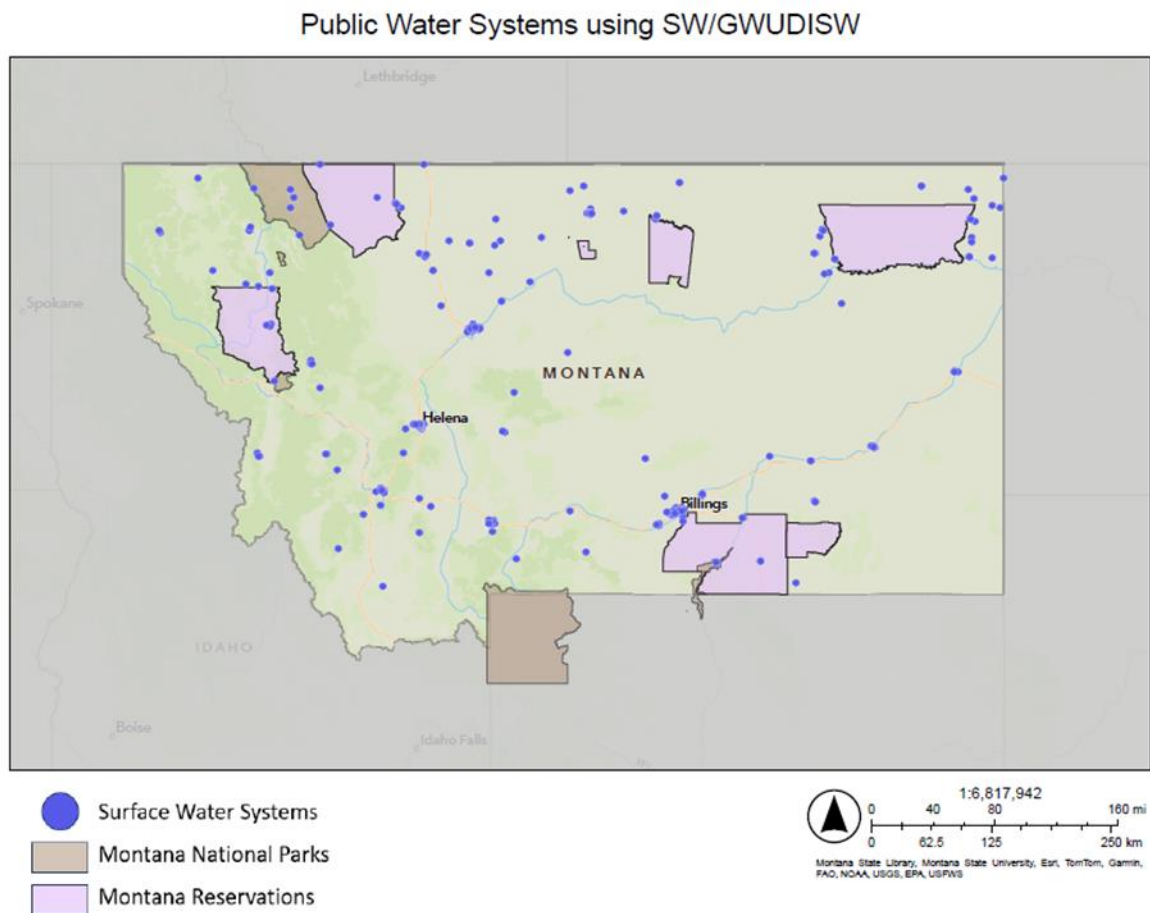


Figure 11. Public Water Systems using Surface Water/Groundwater under the Direct Influence of Surface Water

11.2 GROUNDWATER SYSTEMS

Groundwater is a primary or secondary source for 2057 public water systems, serving 531,057 people daily (Figure 12).

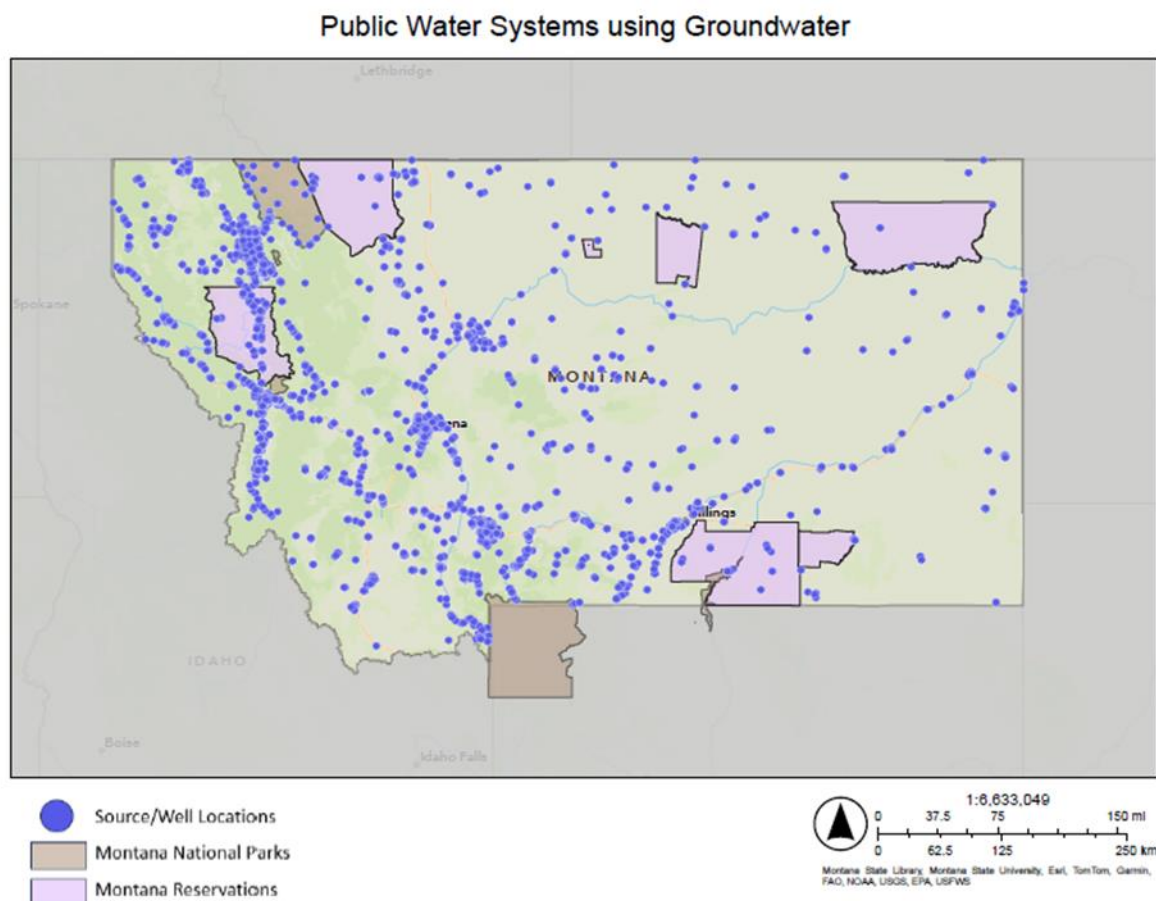


Figure 12. Public Water Systems using Groundwater

12.0 COMMUNITY SUPPORT PROGRAMS

The Water Quality Division supports numerous community support programs designed to help rural Montana communities maintain and/or restore the quality of their waters for future generations. Communities with effective programs to prevent drinking water contamination may enjoy substantial savings in the costs of complying with the federal Safe Drinking Water Act or similar state regulations. For example, water purveyors that prevent pollutants from entering water supply reservoirs will have lower costs for treating the water. Further, they may also be eligible for waivers from some monitoring requirements, thereby reducing costs.

12.1 SOURCE WATER PROTECTION PROGRAM

Under the 1996 federal Safe Drinking Water Act, the state is required to implement a source water assessment program. The aim is to delineate areas that provide a source for public drinking water, which applies to both existing and new supply sources. There is no state or federal regulatory protection assigned to these identified source water protection areas. However, the delineation and assessment identify significant threats to drinking water supplies and provide suppliers of public water with the information they need to protect their water sources. Source Water Assessment Reports are available within the [Source Water Protection GIS viewer](#).

Identify areas that provide a source for public drinking water and delineate those areas according to time-of-travel calculations based on local geologic and hydrologic conditions.

Inventory businesses, activities, or land uses that generate, use, store, transport, or dispose of certain contaminants in identified source water protection areas.

Estimate the susceptibility to contamination from these sources.

Figure 13. Steps for Completing a Source Water Delineation and Assessment Report (SWDAR)

Montana considers public water supplies with no susceptibility ratings higher than “moderate” to be substantially implementing source water protection. There are 587 community water systems in Montana meeting this criterion, providing drinking water to 48% of community water system users.³⁶ DEQ reviewed over 200 source water assessments for new public water sources between 2019-2022. Thoughtful site selection and review by DEQ’s Source Water Protection Program can help communities avoid costs related to contamination, which may include:

- Treating and/or remediating water supplies
- Finding and developing new water supplies and/or providing emergency replacement water
- Abandoning a drinking water supply due to contamination
- Paying for consulting services and staff time
- Conducting public information campaigns when incidents arouse public and media interest in source water pollution

12.2 DRINKING WATER AND WATER POLLUTION CONTROL STATE REVOLVING FUND

Details of Montana’s drinking water and water pollution control revolving funds may be found on the DEQ [Engineering Infrastructure & Subdivision Program website](#).

The Montana Legislature established two State Revolving Fund (SRF) Loan Programs - one for wastewater and nonpoint source projects and the other for drinking water projects. Both programs provide at or below market interest rate direct loans or refinancing of existing debt to eligible Montana entities. The yearly Intended Use Plan and Project Priorities List for each of the SRF loan programs is available on the website. DEQ oversees the program by providing technical expertise and preparing an annual plan for intended use for each capitalization grant application, while DNRC administers the financial aspect, including overseeing loans and the sale of state general obligation bonds.

12.2.1 Water Pollution Control State Revolving Fund

The Water Pollution Control State Revolving Fund (WPCSRF) Program was established for wastewater and nonpoint source pollution control projects. The long-term goal of WPCSRF is to maintain, restore, and enhance the chemical, physical, and biological integrity of Montana’s waters for the benefit of the overall environment and to protect public health, while maintaining a long-term, self-sustaining program. Examples of eligible water quality projects includes wastewater treatment plant improvements, agricultural BMPs, urban storm water/construction runoff, wetlands/stream bank restoration, underground storage tanks, and septic system removal or upgrade.

12.2.2 Drinking Water State Revolving Fund

The Drinking Water State Revolving Fund (DWSRF) program is a federal-state partnership to help ensure safe drinking water. The program provides financial support to water systems and to state safe water programs and is designed to provide a perpetual source of financial assistance to Montana communities. Funds may be used to improve the infrastructure of public drinking water facilities or support other activities related to public health and compliance under the federal Safe Drinking Water Act. Examples of projects include acquisition of land that is integral to the project, engineering, new sources, treatment, source water protection, storage, and distribution.

13.0 COST-BENEFIT ASSESSMENT

Section 305(b) of the federal CWA requires states to “report on the economic and social benefits of actions necessary to achieve the objective of the CWA” (U.S. Environmental Protection Agency, 1997). The following provides a summary of the state-level program costs and benefits associated primarily with DEQ’s point-source and nonpoint source (NPS) efforts to achieve CWA objectives. Costs are estimated for state fiscal years 2019 (July 1, 2018 – June 30, 2019), 2020 (July 1, 2019 – June 30, 2020), 2021 (July 1, 2020 – June 30, 2021), and 2022 (July 1, 2021 – June 30, 2022). Note that some costs reported here include federal funds (as indicated). Costs are averaged annually for FY 2019 and FY2020 as well as for FY2021 and 2022. Because of how DEQ collects data, benefits are estimated for calendar years 2019, 2020, 2021 and 2022, rather than the fiscal years. Furthermore, most benefits are non-monetary and are, thus, hard to calculate quantitatively.

13.1 POINT SOURCE PROGRAM COSTS

In fiscal years 2019 and 2020, approximately \$165 million total was spent in Montana to address point-source pollution, which averages about \$78.5 million per year. Of this total annual amount, \$44 million was funded annually from the Water Pollution Control State Revolving Fund (WPCSRF), and \$34.5 million was funded annually from other state and federal wastewater infrastructure. WPCSRF funding historically makes up one-half to three-quarters of the total public funding for addressing point-source issues in Montana, although within the last few years, the USDA Rural Development program has been able to acquire additional funds from the USDA Rural Development program national pool to increase their loan and grant funds for Montana communities. The other major portion of point-source expenditures consists of the DEQ discharge permitting and compliance program. The Water Protection Bureau supports 30 full-time employees fully staffed. On average, implementing programs costs about \$4.1 million per year (for all four fiscal years) and includes MPDES, MGWPCS, CWA’s Section 401 certification program, and other state authority permitting.³⁷ This brings the FY2019 and FY 2020 total cost per year to \$82.6 million.³⁸

Most of the \$82.6 million per year was spent on capital improvements of municipal wastewater treatment and collection systems; the remainder was spent on permitting and compliance. This estimate includes money spent by all funding agencies in the state and all major federal programs. Capitalization grants from EPA (CWA Title VI Federal funds) for the WPCSRF, along with state matching funds and recycled loan payments, provide financial assistance for water pollution control projects that target mostly point sources. In addition, WPCSRF provides training for wastewater operators and technical assistance (using CWA Section 106 funds and CWSRF non-program fee funds) to operators, engineers, and the public in wastewater treatment.

In fiscal years 2021 and 2022, approximately \$174 million total was spent in Montana to address point-source pollution, which averages about \$87 million per year. Of this total annual amount, \$36.5 million was funded annually from the Water Pollution Control State Revolving Fund (WPCSRF), \$46.5 million was funded annually from other state and federal wastewater infrastructure. Also included in the amounts above is federal assistance from the American Rescue Plan Act of 2021 which provided recovery funds in fiscal year 2022 to the State of Montana for necessary investments in sewer infrastructure. The \$4.1 million per year brings the FY2021 and FY2022 total cost per year to \$87 million.

Most of the \$87 million per year was spent on capital improvements of municipal wastewater treatment and collection systems; the remainder was spent on permitting and compliance. This estimate includes money spent by all funding agencies in the state and all major federal programs. Capitalization grants from EPA (CWA Title VI Federal funds) for the WPCSRF, along with state matching funds and recycled loan payments, provide financial assistance for water pollution control projects that target mostly point sources. In addition, WPCSRF provides training for wastewater operators and technical assistance (using CWA Section 106 funds and CWSRF non-program fee funds) to operators, engineers, and the public in wastewater treatment.

13.2 NONPOINT SOURCE AND WETLANDS SECTION COSTS

Most of DEQ's Nonpoint Source and Wetlands Section budget comes from EPA under CWA Section 319 grant funds and general funds appropriated by the state legislature. This annual budget pays for nonpoint source pollution reduction projects in Montana as well as DEQ's NPS-related internal activities including standards development, water quality monitoring and assessment, quality assurance and quality control, water quality and watershed modeling, water quality planning and TMDL development, NPS program development and support.³⁹

EPA requires a non-federal match of 40% for the grants. The Section 319 grants come in two awards: Project funding and Program funding (staffing and support). Match for the state program is met with state general funds. Match for project activities (implementation of watershed-based plans) is met by project sponsors through in-kind services, project property owner contributions, and other state agency grant awards (usually through Department of Natural Resources and Conservation and Fish, Wildlife & Parks).

The 319 funding amounts over the past four fiscal years are shown on **Tables 16 and 17**.⁴⁰

Table 16. Section 319 Project Grant Funding Amounts

Year	\$319 Grant	Non-federal match	Total
2019	\$1,041,000	\$694,000	\$1,735,000
2020	\$1,053,500	\$702,333	\$1,755,833
2021	\$1,114,500	\$743,000	\$1,857,500
2022	\$1,500,000	\$1,000,000	\$2,500,000

Table 17. Section 319 Staffing and Support Grant Funding Amounts

Year	\$319 Grant	Non-federal match	Total
2019	\$1,051,500	\$701,000	\$1,752,500
2020	\$1,041,000	\$694,000	\$1,735,000
2021	\$1,053,500	\$702,333	\$1,755,833
2022	\$1,114,500	\$743,000	\$1,857,500

In addition to NPS monies so far discussed, since 1996, WPCSRF has also funded NPS projects, including agricultural best management practices, landfills, and stormwater projects. WPCSRF funds for NPS projects averaged \$1.0 million per year from FY 2019 through FY 2022. This amount is beyond the WPCSRF-funded point-source control projects during the same time period. This, along with the \$3.6 million per year from EPA and matching funds, leads to a total of about \$4.4 million spent per year in Montana on nonpoint source pollution for FY2019 and FY2020 and about \$5.0 million per year for FY2021 and FY2022 (**Table 18**).

For SFY 2019 and 2020, Montana's NPS Program project costs, including EPA funding and committed local matches, averaged \$4.4 million per year. For SFY 2021 and 2022, Montana's NPS Program project costs, including EPA funding and committed local matches, averaged \$5.0 million per year (see **Table 18**). Of this, about half supports internal activities and half goes to competitively funded activities through contracts to address nonpoint source pollution.

The DEQ Wetland Program, which supports one full-time employee, costs approximately \$140,000 per year: federal contributions of \$105,000 with a state match of \$35,000 (SRF). This supported one full time FTE. There is approximately \$40,000 yearly contracting in this grant.⁴¹

13.3 OTHER COSTS OF PROTECTING WATER QUALITY IN MONTANA

The federal Safe Drinking Water Act requires the state to conduct source water assessments for new drinking water sources at public water systems. The assessments, conducted by DEQ's Source Water Protection Program, identify point and nonpoint sources of contamination to groundwater. DEQ decides whether to approve proposed development sites based, in part, on these assessments. While this effort helps keep drinking water sources free of contaminants, it does not eliminate contaminant sources. DEQ reviews between 50 and 60 new public drinking water sources per year and requires 2 FTE from the Source Water Protection Program at a cost of about \$299,000 per year.⁴²

13.4 SUMMARY OF MONTANA'S CLEAN WATER COSTS

The average annual cost for Montana's point- and nonpoint source pollution programs from all funding sources, plus wetland and drinking water protection, was approximately \$87.4 in FY 2019 and FY2020 and was \$92.5 million in FY 2021 and FY 2022 (**Table 18**).

Table 18. Summary of Average Annual Costs for CWA Programs in Montana (FY 2019 through FY 2022)

Activity	Total FY2019 and FY2020 (millions of dollars)	Total FY2021 and FY2022(millions of dollars)
NPS Control Programs	\$4.4	\$5.0
NPS staffing and support	\$1.7	\$1.8
NPS projects grant	\$1.7	\$2.2
WPCSRF NPS funds	\$1.0	\$1.0
Point Source Control Programs (including discharge and permitting/compliance)	\$82.6	\$87.1
WPCSRF funds	\$44	\$36.5
Other state and federal funding programs	\$34.5	\$46.5
Permitting and compliance	\$4.1	\$ 4.1
Other Costs	\$0.44	\$0.44

Activity	Total FY2019 and FY2020 (millions of dollars)	Total FY2021 and FY2022(millions of dollars)
Wetlands	\$0.14	\$ 0.14
Safe Drinking Water Act	\$0.3	\$ 0.3
TOTAL	\$87.44	\$92.55

13.5 BENEFITS OF COMPLYING WITH CWA IN MONTANA

While the benefits of clean water and a healthy environment may be challenging to quantify in pure economic numbers, their derived benefits and importance to all plants and animals (including humans) cannot be understated. Indeed, several aspects of water quality programs are simply designed to prevent the deterioration of current conditions (e.g., by preserving water quality standards and controlling point sources of pollutants). Without water quality management, the benefits of aesthetics, recreational activities (fishing/swimming), and drinking water supplies, to name a few, would be diminished or lost in Montana and downriver states.

Though DEQ can quantify the many dollars that are spent to maintain the status quo (i.e., existing water quality benefits), putting a dollar amount on aesthetics, recreational opportunities, and benefits to plants and animals is more difficult. Further, many benefits of maintaining water quality indirectly benefit people in ways that are hard to see, such as sustaining natural nutrient cycles, which can benefit ecosystems, sustain wildlife, and reduce drinking water treatment costs.

In general, the benefits of maintaining and improving the quality of Montana's waters and wetlands include the following:

- Preserving or improving the quality and monetary value of Montana's water-related recreational activities, such as fishing, commercial and non-commercial boating, swimming, whitewater rafting and kayaking, river floating, and birding/wildlife viewing. This applies to both in-state and out-of-state recreationists (i.e. those who enjoy higher levels of water quality downstream from Montana such as on the Missouri River).
- Protecting industrial, commercial, and municipal uses, thereby reducing or eliminating the cost of treatment for protecting human health.
- Protecting agriculture, including keeping irrigation ditches free from excessive algae and keeping range animals healthy.
- Maintaining property values for homes, businesses, and land where clean water is a major attribute of that value.
- Protecting aquatic wildlife and its associated ecological value, including riparian and wetland species. Several fish species are federally listed as endangered or threatened, or as state species of concern.
- Protecting aquatic and terrestrial habitats (including natural functions such as nutrient cycling) that require high-quality waters; this may include riparian vegetation.
- Protecting water for downstream states. As a headwater state (for the Missouri River), Montana plays a crucial role in preserving or improving the quality of water for states downstream of Montana.
- Maintaining jobs and incomes from water quality efforts beyond what would otherwise exist without these efforts, including consultants, contractors, field crews, and retailers of recreational equipment and supplies.

13.5.1 Point Source Program Benefits⁴³

The long-term goal of the Water Pollution Control State Revolving Fund (WPCSRF) is to maintain, restore, and enhance the chemical, physical, and biological integrity of the state's waters for the benefit of the overall environment and the protection of public health, while maintaining a long-term, self-sustaining program. The WPCSRF program also provides technical assistance to municipal wastewater treatment facilities in Montana. This assistance includes training, troubleshooting, operation and maintenance inspections, and comprehensive performance evaluations to optimize the treatment performance of these facilities. The beneficial economic effects of Montana's WPCSRF program on water quality and public health in calendar years 2019 - 2022 were:

- Improved quality of various state waters by providing loans to ten (10) communities for upgrading, expanding, or replacing inadequate secondary treatment systems that empty into state waters.
- Improved water quality and reduced operating expenses by providing loans to five (5) communities for municipal wastewater projects for reducing infiltration and inflow in the collection systems and replacing leaky pipes to prevent stormwater runoff or groundwater from entering the system.
- Reduced nutrient and other pollutant loading to state waters by providing funding to eleven (11) communities for projects involving advanced treatment processes, such as nutrient removal and disinfection.

13.5.2 Montana Pollutant Discharge Elimination System (MPDES)

Nitrogen

Prior to the first optimization training class in mid-2012, the concentration of nitrogen discharged from treatment plants not designed for nutrient removal averaged 17 mg/L in discharges. After nearly 10 years of consistent messaging and support from DEQ, the facilities – without facility upgrades – are discharging a yearly average of 12 mg/L of total-nitrogen (**Figure 14**).

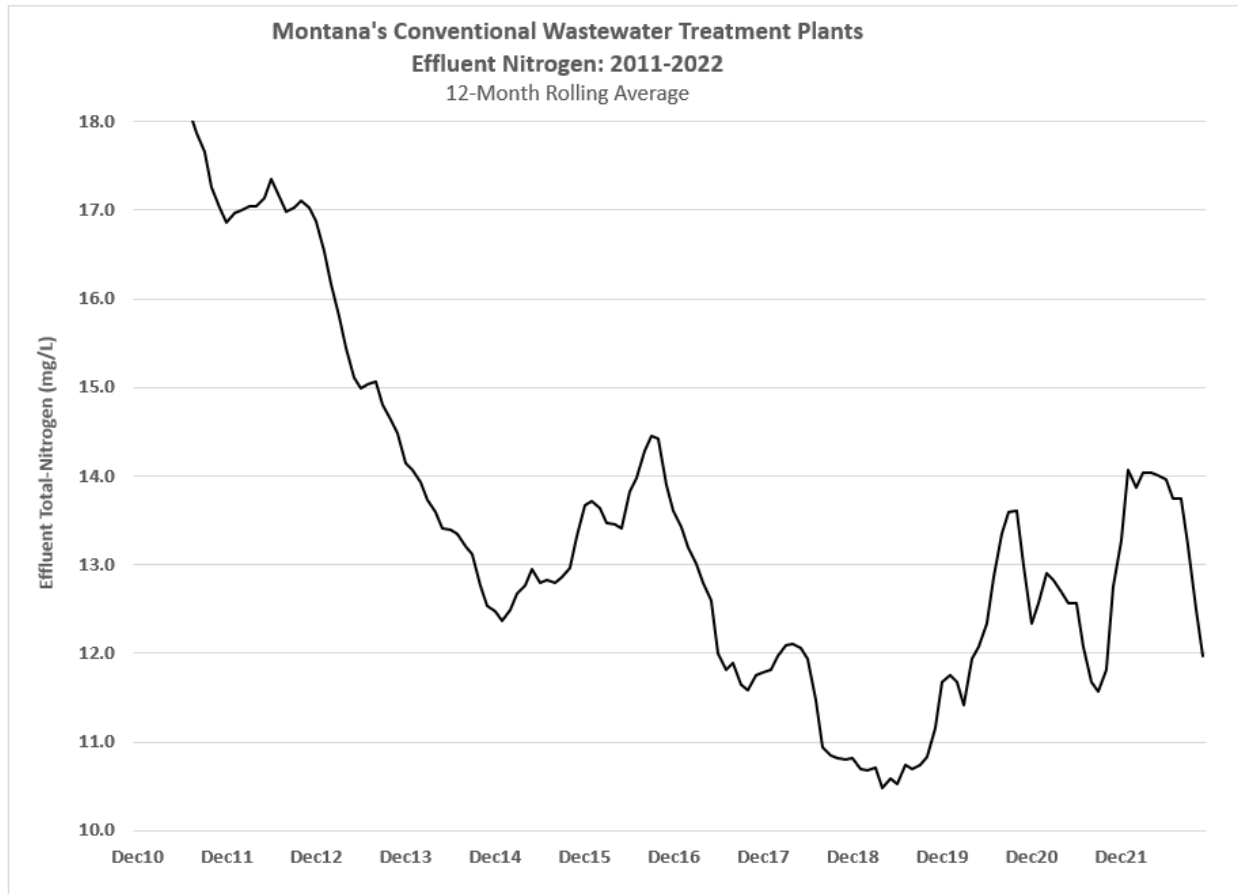


Figure 14. Conventional Wastewater Treatment Plants Average Effluent Nitrogen: 2011 – 2022

Note: The graph is a 12-month rolling averages using data from December 2010 through December 2022.

Phosphorus

Prior to the first optimization training class in mid-2012, the concentration of phosphorus discharged from treatment plants not designed for nutrient removal averaged over 2.5 mg/L. After nearly 10 years of consistent messaging and technical support from DEQ, the facilities – without facility upgrades – are discharging a yearly average of 1.7 mg/L of total-phosphorus (**Figure 15**).

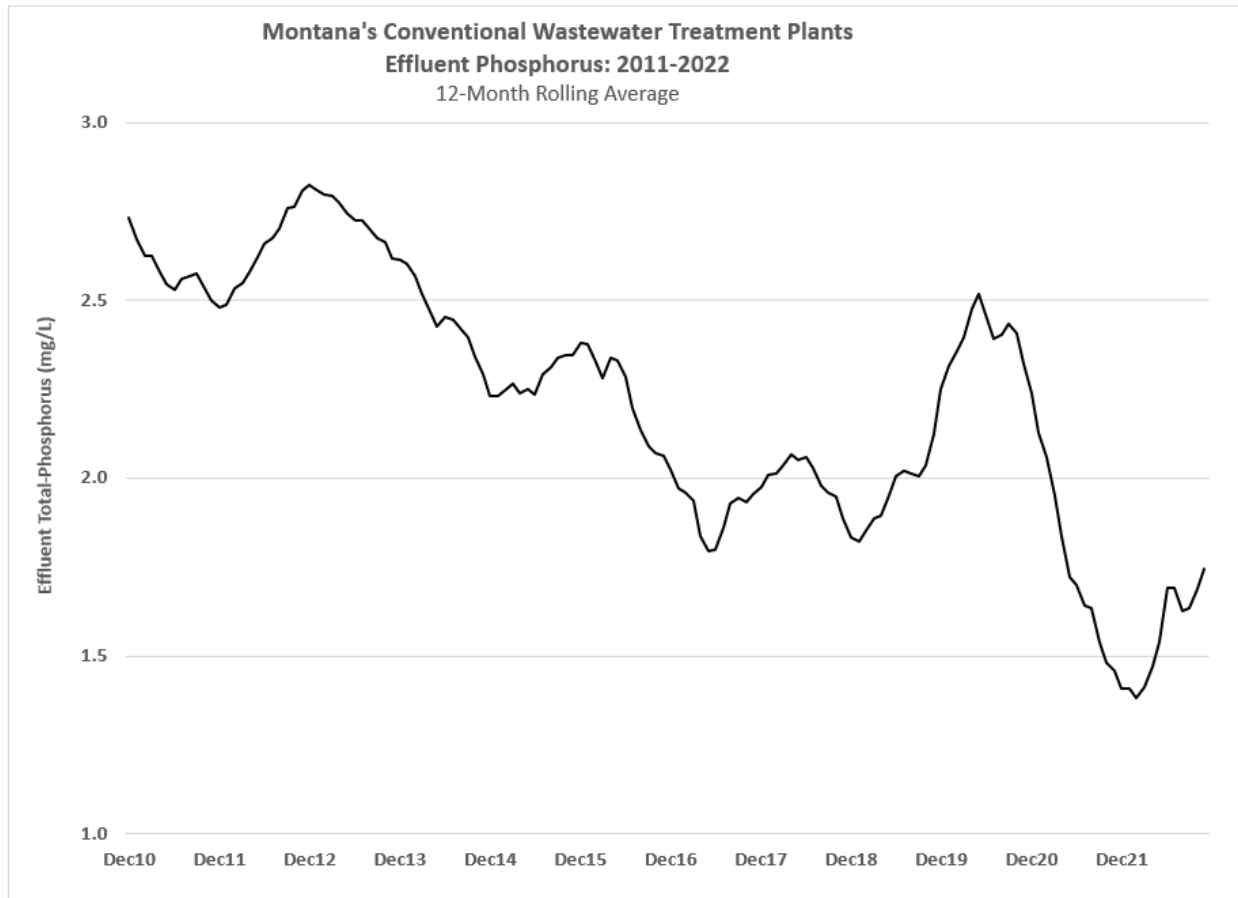


Figure 15. Conventional Wastewater Treatment Plants Average Effluent Phosphorous: 2011 - 2022

Note: The graph is a 12-month rolling averages using data from December 2010 through December 2022.

13.5.3 Montana Groundwater Pollution Control System (MGWPCS)

MGWPCS-permitted facilities removed an average of over 3,000 lbs. of total nitrogen each year during this period, a reduction of nearly 50% compared to conventional treatment systems.

13.5.4 Nonpoint Source Program Benefits

The goal (or benefit) of the state's NPS Program is to manage and reduce nonpoint source pollutants so that waterbodies support their designated beneficial uses. The goal of DEQ's NPS Management Program is to provide a clean and healthy environment by protecting and restoring water quality from the harmful effects of NPS pollution.⁴⁴ When waterbodies are impaired, the goal is to reduce NPS pollution to a level that allows full support of beneficial uses. DEQ's NPS Management Program supports watershed groups, conservation districts, water quality districts and nonprofits around the state to

actively engage local landowners and partners to address nonpoint source pollution in socially acceptable and economically beneficial projects and programs. **Table 19** outlines the funding awarded to these such projects.⁴⁵

Table 19. Nonpoint Source Program Funding Awards

Year	Funding Awarded	# of Projects Awarded	Match Provided (\$)	Match Provided (%) Beyond Required 40%	Active Contracts Managed	Contracts Closed
2019	\$1,232,240	13	\$1,328,192	12%	35	6
2020	\$998,944	9	\$731,068	2%	35	13
2021	\$1,050,640	8	\$748,295	2%	32	9
2022	\$1,363,900	13	\$1,225,763	7%	36	9

2019⁴⁶

- Kicked off the Focus Watershed effort in the Bitterroot watershed.
- Visited 12 past §319 project sites during 2018 and 2019 to evaluate their effectiveness at continued achievement of intended goals. Overall, projects are continuing to achieve their goals 4-13 years after implementation.
- Published TMDL Implementation Evaluations for:
 - Big Spring Creek
 - Cramer Creek
 - the Clark Fork River
 - Lake Helena
- Supported local watershed group development of new or updated Watershed Restoration Plans in the Bitterroot, Lower Clark Fork watersheds. WRP development continues in watersheds around the state.
- Published the Madison Nutrient, E. coli, and Metals TMDLs.
- Sampled 53 reference sites in 2018 and 2019.
- Monitored water quality throughout the Clark Canyon Reservoir and the Beaverhead River, Clark Fork River, Lake Koocanusa, Lake Mary Ronan, Missouri River, Red Rock River watershed, Smith River, Taylor Fork of the Gallatin River, streams near Cooke City, and the Yellowstone River.
- Conducted assessments for 45 waterbody segments, including 400 waterbody-pollutant combinations, in the Cooke City area and Armells, Beaverhead, Musselshell, Madison, Tongue, and Kootenai watersheds.
- Responded to 110 citizen reports of Harmful Algal Blooms during 2018 and 2019, which included advising and coordinating beach closures where necessary.
- Coordinated a workgroup of local, state, and federal agencies to update the Montana Stream Permitting Guide for the first time since 2001.
- Renewed a memorandum of agreement with the US Forest Service.
- Developed the Riparian Evaluation Method, which will be used to track improvements in riparian vegetation density and identify potential project locations for local watershed groups.
- Supported volunteer monitoring efforts around the state by providing training and funding for laboratory analysis, and lending field equipment. \$34,753 was awarded to 15 programs to cover the costs of laboratory analysis.

- Supported the Montana Watershed Coordination Council's (MWCC) capacity-building and educational efforts. MWCC efforts included:
- Funded 22 initiatives through the Watershed Fund during 2018 and 2019.
- Provided \$114,000 in capacity and professional development for 17 local organizations in 2019.
- Highlighted eight watersheds through the Watershed Stories Campaign (mtwatersheds.org/app/watershed-stories/).
- Hosted the 2019 biennial MWCC Symposium in Whitefish, MT and the 2019 Watershed Tour of the Missouri headwaters.
- Helped fund 38 Big Sky Watershed Corp members in 2018 and 2019.
- Managed 22 §319 project contracts. 16 of these were newly selected during the FY 2018 and FY2019 Call for Applications. New projects included:
- Bitter Root Water Forum's Three Stevensville Projects
- Soil and Water Conservation Districts of Montana's Incentive-based Strategy to Reduce Nonpoint Source Pollution from Septic Systems in the Flathead Basin.
- Green Mountain Conservation District's Simms Meander Project.
- Closed eight §319 Projects contracts. These projects reduced pollution by 198 tons sediment/year, 109 lbs nitrogen/year and 18 lbs phosphorus/year.
- Helped identify potential watersheds for implementation of the NRCS National Water Quality Initiative, and participated in NRCS State Technical Advisory Committee meetings.

2020⁴⁷

- Continued with year 2 of 3 of the Focus Watershed effort in the Bitterroot watershed.
- Established a Project Effectiveness Review system for field data collection during project tours and reporting on the efficacy of different BMPs and overall long-term project success.
- Published TMDL Implementation Evaluations for:
 - [Bitterroot Headwaters](#)
 - [Ruby River Watershed](#)
 - [Big Spring Creek](#)
- Supported local watershed group development of new or updated Watershed Restoration Plans in the Beaverhead, Central Clark Fork tributaries, Clarks Fork of the Yellowstone, Clearwater, Madison, Big Hole, Middle Fork Judith, and Sun River watersheds.
- Published the Madison watershed sediment and temperature TMDLs, Beaverhead metals TMDLs, and Sheep Creek aluminum TMDLs.
- Sampled 23 reference sites in 2019.
- Approved site-specific selenium standards for Lake Koocanusa and selenium standards for the Kootenai River.
- For the 2020 Integrated Reporting cycle, Monitoring and Assessment Section completed 303(d)/305(b) assessments for 45 waterbody segments, including approximately 400 individual waterbody-pollutant combinations in the following project areas: Red Rock Creek Watershed, Beaverhead Watershed, Cooke City area, and a few other scattered watersheds and waterbodies.
- Monitored water quality for trend analysis, impairment assessment, or documenting success stories Responded to 111 citizen reports of Harmful Algal Blooms during 2019 and 2020, which included advising and coordinating beach closures where necessary.

- Conducted a Riparian Evaluation for the Bitterroot watershed, and the data will be used to track improvements in riparian vegetation density and identify potential project locations for local watershed groups.
- Supported volunteer monitoring efforts around the state by providing training and funding for laboratory analysis, and lending field equipment. \$49,615 was awarded to 15 groups to cover the costs of laboratory analysis.
- Supported the Montana Watershed Coordination Council's (MWCC) capacity-building and educational efforts. MWCC efforts included:
 - Distributed \$270,370 in project support funding from NRCS and DEQ to implement conservation and restoration activities during 2018 and 2019.
 - Provided \$193,400 in capacity and professional development for dozens of local organizations in 2019 and 2020.
 - Created a series of [audio watershed stories](#) highlighting the impact of individuals restoring and protecting water resources in the Beaverhead, Bitterroot, Deep Creek and Granite Headwaters watersheds.
 - Hosted the 2019 biennial MWCC Symposium in Whitefish, MT, the 2019 Watershed Tour of the Missouri headwaters, and the 2020 Summit to Stream virtual symposium.
 - Helped fund 46 Big Sky Watershed Corp members in 2019 and 2020.
- Managed 30 §319 project contracts. 17 of these were newly selected during the FY 2019 and FY2020 Call for Applications. New projects included:
 - Clark Fork Coalition's lower Bitterroot tributaries projects: decommissioning 11 miles of forest roads and remove 25 culverts in the Upper Lolo, designing one sediment reduction project along O'Brien Creek, and restoring 2,800 feet of Miller Creek.
 - Soil and Water Conservation Districts of Montana's Incentive-based Strategy to Reduce Nonpoint Source Pollution from Septic Systems in the Flathead Basin.
 - Upper Clark Fork Program of Trout Unlimited's restoration of 1,200 feet of Flint Creek.
- Closed 11 §319 Projects contracts. These projects reduced pollution by 3,690 tons sediment/year, 61 lbs nitrogen/year and 80 lbs phosphorus/year.
- Regularly input §319 project information into GRTS.
- Helped identify potential watersheds for implementation of the NRCS National Water Quality Initiative and participated in NRCS State Technical Advisory Committee meetings.

2021

- In 2021, the Clark Fork Coalition received \$287,300 to decommission 4.4 miles of unused forest roads, upgrade at least 19 culverts, and install large woody debris jams along 19.1 miles of streams in the Upper Lolo watershed. This phase of work builds on similar projects implemented in the Upper Lolo beginning in 2006.
- Abandoned placer mines throughout the Ninemile Creek drainage have caused channel confinement and substrate alterations that result in dewatering, fish passing barriers, and sediment pollution. Trout Unlimited received \$400,000 and restored 5,700 feet of Ninemile Creek, created 26 acres of floodplain and riparian habitat, and prevented 1,387 tons/year of sediment pollution. In 2021, Trout Unlimited received \$200,000 to continue remedying placer mining impacted reaches of Ninemile Creek. This phase will accomplish removal of 245,000

cubic yards of placer processed material and reestablishment of 6,500 feet of naturally functioning stream channel and 45 acres of floodplain and wetlands.

- In 2021, The Lincoln Conservation District received \$404,996 and restored 4,200 feet of the Tobacco River and prevented 207 tons/year of sediment pollution. Past gravel mining operations, removal of vegetation, and overgrazing had caused channelization and severe streambank erosion. The project re-established riffle-pool stream habitat features, wetlands and riparian areas, stable streambanks and a reconnected floodplain.
- Ranching for Rivers is a cost-share program that funds ranchers operating on DEQ-identified impaired waterbodies and tributaries. Montana Association of Conservation Districts received \$90,245 to administer the program and worked with landowners to install 44,571 feet of fencing installed along 6 miles of impaired stream, providing four grazing management plans, and preventing 45 tons/year sediment, 284 pounds/year nitrogen, and 332 pounds/year phosphorus pollution.
- Lewis & Clark Water Quality Protection District received \$198,046 and completed bank stabilization and revegetation along 2,100 feet of Prickly Pear Creek, reducing sediment pollution by 286 tons/year
- As the name implies, Cow Creek has a long history of use by livestock. Much of the stream is overwide, entrenched from its floodplain, and lined by unstable streambanks and disturbed soil. The Flathead Conservation District received \$67,619 and worked with two different landowners to revegetate and install livestock fencing and two water gaps, restoring a total of 5.7 acres of riparian area at the two properties. The project reduced 38 pounds/year nitrogen and 9 pounds/year phosphorus pollution.
- Montana Watershed Coordination Council received \$74,650 to administer the Big Sky Watershed Corp program. Under this contract, the seven local watershed organizations received funding to host AmeriCorp members who reduced nonpoint source pollution by conducting education and outreach and organizing volunteer events to restore native streamside vegetation and pollinator habitat, organize stream clean ups, and improve stormwater management. In total, the program reduced 52 tons/year sediment pollution under this contract.
- Clark Fork Coalition received \$98,400 and prevented 346 tons/year of sediment pollution along 1 mile of Miller Creek. They created 753 feet of new and side channel habitat and improved 0.06 acres of wetland by lowering the floodplain, stabilizing streambanks with woody debris matrixes, and revegetating
- The Montana DEQ Standards & modeling Section continued developing an upper Yellowstone nutrient model, Canyon Ferry nutrient model, a Tongue River salinity model, and a Flathead Lake revised watershed model. Standards also worked closely with the Nutrient Work Group preparing to implement narrative nutrient criteria.
- DEQ continues to provide training and technical and financial resources for volunteer monitoring programs. These programs heighten awareness of water resource issues and solutions, and help increase the amount of credible data. In 2021, the DEQ Monitoring and Assessment Section awarded \$33,928 to nine volunteer monitoring programs through the Lab Analysis Support Program.
- New Water Quality Improvement Plans, also known as Total Maximum Daily Loads, in 2021 include Musselshell E. coli and Red Rock metals, sediment, and E. coli.
- In 2021, The DEQ Nonpoint Source Program published the [Bitterroot Headwaters TMDL Implementation Evaluation](#)

2022

- In 2022, A total of 36 restoration, education, and planning projects were active in 2022, 13 of those were newly initiated and 7 were completed. Projects completed in 2022 reduced pollution by 169 tons/year of sediment, 802 pounds/year of nitrogen, and 718 pounds/year of phosphorus.
- In 2022, Abandoned mine sites from the historic Elliston Mining District have resulted in heavy metal impacts to the Little Blackfoot River. Trout Unlimited received \$240,000 to remove and safely dispose of 30,000 cubic yards of mine waste rock scattered throughout the Tramway Creek and Upper Little Blackfoot River watersheds. Removal of the mine waste rock, reconstruction of a portion of the Little Blackfoot River, and revegetation of disturbed areas have reduced the amount of aluminum, arsenic, cadmium, copper and lead leaching into the Little Blackfoot River.
- In 2022, Swan Valley Connections received \$67,958 to reduce sediment delivery to streams and to Swan Lake from roads in the Lower Swan Valley watershed. The project involved removing buried and non-working culverts, installing new culverts, removing aging log abutments from an abandoned bridge, reshaping roadbeds and recontouring and revegetating slopes to prevent 0.5 tons/year of sediment pollution from entering Goat Creek and Squeezer Creek, tributaries to the Swan River.
- The Big Blackfoot Chapter of Trout Unlimited (BBCTU) received \$289,000 to reduce sediment erosion and improve riparian in-stream habitat along 7,100 feet of Nevada Creek, upstream of Nevada Lake. Project components included restoration of natural stream channels, installation of fencing and water gaps for livestock, and riparian vegetation plantings. Previous project phases have been successfully implemented on other sections of Nevada Creek. This project resulted in reducing sediment pollution to Nevada Creek by 168 tons/year.
- In 2022, Montana Watershed Coordination Council received \$81,230 to administer the Big Sky Watershed Corps program. Under this contract, six local watershed organizations received funding to host AmeriCorps members to help implement watershed restoration plans and reduce nonpoint source pollution. Members coordinated education and outreach events and organized volunteer activities to implement conservation practices. In total, the program reduced nonpoint source pollution by 0.5 tons/year of sediment, 4.4 lbs/year of nitrogen, and 5.8 lbs/year of phosphorus.
- The Sun River Watershed Group received \$49,500 for the Muddy Creek Crossing and Habitat Project. This project restored natural stream function to Muddy Creek, a tributary to the Sun River, by replacing a failing stream crossing with a permanent crossing to lessen erosion, installing fencing to reduce grazing pressure on the riparian areas and planting additional native vegetation. The project reduced nutrient loading by 37 pounds/year of nitrogen pollution and 49 pounds/year of phosphorus pollution.
- The Montana DEQ Standards & Modeling Section successfully completed 20 consecutive years of monitoring for DEQ stream reference sites. In 2022, 15 sites were visited to collect chemical, biological, and physical data that are useful for describing water quality reference conditions in Montana's ecoregions. Efforts are underway for trend analysis and reporting.
- During 2022, the Monitoring and Assessment Section continued monitoring for nutrients and metals on the Upper Missouri River and started nutrient and metals monitoring on Canyon Ferry tributaries and in the Clarks Fork Yellowstone watershed. Sediment monitoring and pre-construction Bank Erosion Hazard Index (BEHI) monitoring was conducted on O'Brien Creek, a tributary to the Bitterroot River. DEQ staff and local partners also completed field work to assess a potential success story on Goat Creek.

- In 2022, DEQ drafted a Nutrient Protection Plan for the Bitterroot River, which provides information that, with local support, can keep the river from becoming impaired.

13.5.5 Wetland Program Benefits

2019

- The Wetland Program led a year long strategic planning process for the Montana Wetland Council. The strategic planning process was undertaken to explore and implement a new committee structure and to develop a 10-year Strategic Framework with actionable items Council partners could undertake to help meet the Councils goals and objectives.⁴⁸

2020

- The Wetland Program wrote and was awarded a \$323,750 Wetland Program Development Grant to continue the development a wetland monitoring and assessment and voluntary restoration components of the program, better understand the regulatory framework that impacts wetland at the Department, and to develop a Small Project Assistance Program that helps fund the development of Montana Wetland Council Strategic Planning Actions. In 2020 the Wetland Program also led the writing and publishing Montana Wetland Council's 2020-2030 Strategic Framework.⁴⁹

2021

- The Wetland Program continues to develop maps and disturbance indices that will identify areas where the greatest potential negative impact on wetland function could occur. Tools like this, along with incorporating wetland assessments into TMDL documents and quantifying load reductions from wetland restoration projects, should increase implementation of wetland restoration projects around the state.⁵⁰

2022

- In 2022, the Wetland Program initiated wetland effectiveness monitoring to quantify site-specific nutrient and sediment load reductions associated with wetland restoration. A Wetland Effectiveness Restoration Dashboard was created and pre-restoration monitoring was conducted at two project sites in the East Gallatin and Bitterroot River watersheds. The wetland program continues to develop maps and disturbance indices that will identify areas where the greatest potential negative impact on wetland function could occur. Tools like this, along with incorporating wetland assessments into TMDL documents and quantifying load reductions from wetland restoration projects, should increase implementation of wetland restoration projects around the state.⁵¹

13.5.6 Source Water Protection Benefits

Source water protection can help communities avoid costs related to contamination, including the costs of:

- Treating and/or remediating
- Finding and developing new water supplies and/or providing emergency replacement water
- Abandoning a drinking water supply because of contamination
- Paying for consulting services and staff time
- Litigating against responsible parties
- Conducting public information campaigns when incidents arouse public and media interest in source water pollution
- Meeting the regulations of the Safe Drinking Water Act, impairing health

Communities with effective programs to prevent drinking water contamination may enjoy substantial savings in the costs of complying with the federal Safe Drinking Water Act or similar state regulations. For example, water purveyors that minimize algae growth by preventing nutrients from entering water supply reservoirs will have lower costs for treating the water to remove total organic carbon (in compliance with the Disinfection Byproducts Rule). Finally, water suppliers with programs to prevent contamination of drinking water may also be eligible for waivers from some monitoring requirements, thereby reducing monitoring costs.

14.0 PUBLIC HEALTH ISSUES

14.1 LEAD IN SCHOOL DRINKING WATER

DEQ and Montana Department of Public Health and Human Services (DPHHS) are collaborating to provide sampling and remediation technical assistance and guidance to schools for the Lead Reduction in Schools Drinking Water Rule. The Lead Reduction in Schools Drinking Water Rule was enacted to protect school children by minimizing lead levels in drinking water provided at Montana's schools. Sampling began in 2020 for all schools accredited by the Montana Board of Public Education at all drinking water fountains, kitchen fixtures that are used for human consumption, and any other fixture used for drinking or food preparation. Other considerations for this rule include creation of an inventory of plumbing materials, all fixtures, and those that are used for human consumption as well as implementation of a water flushing plan. Results then require follow-up activities and DEQ provides assistance and guidance documents to help schools with these requirements. All sample results are available to the public on DEQ's website. DEQ administers a reimbursement program to help schools cover the costs associated with lead mitigation.⁵²

14.2 SPILL REPORTS

During state fiscal years 2020 (July 1, 2019 – June 30, 2020), 2021 (July 1, 2020 – June 30, 2021), and 2022 (July 1, 2021 – June 30, 2022), a total of 63, 55, and 47 spills affecting surface water quality were reported to DEQ, respectively.⁵³ Most were regarding fuel or automotive fluids spilled in result of passenger vehicles entering the water from accidents. The year 2022 includes several spill reports as a result of flooding of the Yellowstone River in June of that year. All incidents were investigated, cleanup actions were required if necessary, and their reports are available from the DEQ Enforcement Program.

14.3 FISH KILLS

The following fish kills occurred in Montana between 2019 - 2022:

- In early April 2019, more than 2,000 fish died in Kremlin Pond and approximately 100 fish died in Reser Reservoir, both near Havre. The deaths were attributed to the harsh winter and the same process as described for the Lake Josephine fish kill.⁵⁴
- On September 8, 2019, more than 40 brown trout, mountain whitefish and suckerfish were killed in the Clark Fork River when significant rain events washed un-remediated slickens into the river.⁵⁵
- In late-August and early September of 2020, approximately 200 mountain whitefish died in the Yellowstone River. The cause of death is believed to be due to proliferative kidney disease (PKD).
- In mid-May of 2021, more than 5,000 fish died in the Madison River near Beartrap Canyon. The cause of death is unknown.⁵⁶
- In early July of 2021, more than 40 fish died on the Smith River near Fort Logan. The cause of death is unknown.⁵⁷
- In August of 2021, more than 2,000 fish died on Cottonwood Reservoir near Wilsall. The deaths were attributed to a low water, high temperatures, and low dissolved oxygen levels.^{58 59}

- In February of 2022, 12 rainbow trout died at a pond near Malmstrom Air Force Base in Great Falls. The cause of death is unknown.⁶⁰
- Over 100 yellow perch died on Dailey Lake in the latter half of March 2022. Low dissolved oxygen levels in the lake during the winter is suspected to be the likely cause of death.⁶¹
- In July of 2022, over 500 fish of many different species died on the Milk River and Rock Creek Valley County due to a heavy rain event that occurred after pesticide applications on uplands.⁶²

14.4 FISH CONSUMPTION ADVISORIES

Montana's Fish Consumption Advisory Board includes a representative from Montana Fish, Wildlife and Parks, Montana Department of Public Health and Human Services, and DEQ. More detailed information on fish consumption advisories issued for waterbodies covered for a portion the 2022-2024 Integrated Reporting timeframe (2019-2021) is available on the [2021 Montana Sport Fish Consumption Guidelines document](#). One additional advisory, Martinsdale Reservoir, had been issued since the finalization of the 2021 Montana Sport Fish Consumption Guidelines and covers a portion of the 2022-2024 Integrated Reporting timeframe (2022). Information on for this specific waterbody is available on the [Martinsdale Reservoir page](#) of the FWP website.

14.5 AQUATIC INVASIVE SPECIES

Aquatic Invasive Species (AIS) include non-native fish, mussels, clams, plants, and disease-causing pathogens. Several state agencies collectively implement the Montana Aquatic Invasive Species Management Plan. The goal of this plan is to minimize the harmful impacts of AIS by limiting or preventing the spread of AIS into, within, and out of Montana. This goal is achieved through coordination and collaboration between partner agencies and stakeholder groups; prevention of new AIS introductions; early detection and monitoring; control and eradication of new and established AIS populations; and outreach and education efforts. Montana developed the "[Montana Invasive Species Strategic Framework](#)" in January 2017.

14.6 HARMFUL ALGAL BLOOM PROGRAM

Harmful algae blooms (HABs), also known as "blue green algae" and "cyanobacteria", are native constituents of Montana's freshwater ecosystems. Under certain conditions, cyanobacteria can bloom into a large, nuisance algal mass. HABs can produce cyanotoxins that can cause illness in humans and illness or death in animals.

The State Harmful Algal Bloom Program (HAB Program) is the result of collaboration between the DEQ, Department of Public Health and Human Services, and Fish, Wildlife, and Parks. The HAB Program officially began in 2017 and provides guidance to local, state, federal, and private landowners to protect people, pets, and livestock from the effects of HABs in Montana. Citizens can visit [HAB.mt.gov](https://hab.mt.gov) to submit reports and photos of suspected cyanobacterial blooms to the HAB Program. The HAB Program uses photos to distinguish between green algae blooms or potentially harmful cyanobacteria blooms. If a HAB is suspected from this visual assessment, the HAB Program works with the local managing jurisdiction, such as county health officials or regional fisheries biologists, to distribute cyanotoxin monitoring resources, provide advice on issuing advisories, and draft a press release to alert the public.

Between 2019 and 2022, a total of 157 citizen reports of suspected HABs were submitted (visit [HAB.mt.gov](https://hab.mt.gov) to view a map of reports). Of these reports, 101 were confirmed to be HABs (see **Table 20**). Unconfirmed citizen reports were either reports of green algae, or insufficient information was provided. The State HAB Program wrote 12 press releases between 2019 and 2022 which helped issue recreation advisories at these locations. Other waterways with confirmed cyanobacteria blooms, though not necessarily with toxins present, from 2019 to 2022 include*:

- Clark Canyon Reservoir (Beaverhead County; 2019, 2020, 2021, 2022)
- Clark Fork River (Missoula/Granite; 2020, 2021)
- Cooney Reservoir (Carbon County; 2020, 2021)
- Cow Creek Reservoir (Hill; 2019)
- Dry Fork Reservoir (Blaine; 2020)
- Ennis Lake (Madison; 2020, 2022)
- Frenchman Reservoir (Phillips; 2021)
- Harrison Lake (Gallatin; 2019, 2020, 2021, 2022)
- Hauser Lake (Lewis & Clark; 2019, 2020, 2021, 2022)
- Hebgen Lake (Gallatin; 2019, 2020, 2021, 2022)
- Herrin Lake (Lewis and Clark; 2022)
- Holter Lake (Lewis & Clark; 2019, 2020, 2021, 2022)
- Homestead Pond (Madison; 2021)
- Hyalite Reservoir (Gallatin; 2019, 2020, 2020, 2022)
- Lake Elmo (Yellowstone; 2019, 2022)
- Lake Helena (Lewis & Clark; 2020, 2021, 2022)
- Lake Mary Ronan (Lake; 2021)
- Martinsdale Reservoir (Meagher; 2022)
- Medicine Lake (Sheridan; 2019)
- Mystic Pond (Gallatin; 2020)
- Nelson Reservoir (Phillips; 2019)
- Nevada Lake (Lincoln; 2022)
- Nevada Reservoir (Powell; 2019, 2020, 2021)
- Noxon Reservoir (Sanders; 2019, 2021)
- Placid Lake (Missoula; 2020, 2021)
- Ruby Reservoir (Madison; 2020, 2021)
- Salmon Lake (Missoula; 2020)
- Seeley Lake (Missoula; 2022)
- Unnamed Pond near Jones Lake (Powell; 2022)
- Unnamed Stockwater Pond (Blaine; 2021)
- Valley Grove and Rustler Trail Pond (Gallatin; 2020)
- Valley West Pond (Gallatin; 2020)
- Willow Creek (Lewis & Clark; 2019, 2020, 2021)
- Willow Creek Dam (Madison; 2021)

Table 20. Confirmed Cyanobacteria Reports

Year	Total Reports	Confirmed Cyanobacteria
2019	47	26
2020	64	42
2021	47	29
2022	52	39

*These figures represent citizen reports and are not a comprehensive list of all possible cyanotoxin blooms in Montana.

15.0 CHANGES IN RESPONSE TO PUBLIC COMMENTS

Will be updated upon document finalization.

GLOSSARY

303(d) List	A compilation of impaired and threatened waterbodies in need of water quality restoration, which is prepared by DEQ and submitted to EPA for approval. This list is commonly referred to as the “303(d) List” because it is prepared in accordance with the requirements of section 303(d) of the federal Clean Water Act of 1972. In the Integrated Reporting format Category 5 is considered the “303(d) list” by EPA. DEQ develops Water Quality Restoration Plans for all category 4C waters in addition to the TMDLs required for category 5 waters.
305(b) Report	A general overview report of state water quality conditions, which DEQ prepares and submits to EPA in accordance with the requirements of section 305(b) of the federal Clean Water Act of 1972. The Integrated Reporting format of this document encourages the combination of 305(b) requirements with 303(d) requirements in a single document.
Anthropogenic impacts Assessment	Human caused changes leading to reductions in water quality. A complete review of waterbody conditions using chemical, physical, or biological monitoring data alone or in combination with narrative information, that supports a finding as to whether a waterbody is achieving compliance with applicable water quality standard.
Basins	For water quality planning purposes, Montana is divided into four hydrologic basins or regions: the Columbia Basin (west slope waters draining to the Columbia River), the Upper Missouri Basin (all Missouri River drainages above the Marias River confluence), the Lower Missouri Basin (Missouri River drainages including and downstream of the Marias River, and a segment of the Saskatchewan drainage in Glacier National Park), and the Yellowstone Basin (waters draining into the Yellowstone and the Little Missouri rivers).
Beneficial uses	The uses that a waterbody is capable of supporting when all applicable WQS are met. What standards apply to a particular waterbody depend on its classification under the Montana Water-Use Classification System.
Beneficial Use Support Determination	A finding, based on sufficient credible data, that a state’s water is – or is not – achieving compliance with the WQS for its applicable beneficial uses.
Best Management Practices (BMPs)	Those activities, prohibitions, maintenance procedures, or other management practices used to protect and improve water quality. BMPs may or may not be sufficient to achieve WQS and protect beneficial uses.

Biological data	Chlorophyll a data, aquatic biology community information (including fish, macroinvertebrates, and algae), and wildlife community characteristics.
Chemistry and toxicity data	Includes bioassay, temperature and total suspended sediment data and information relating to such factors as toxicants, nutrients, and dissolved oxygen.
Communities	Organisms of a biologically related group (i.e., fish, wildlife, macroinvertebrates or algae).
Data categories	Chemistry/physical, habitat, and biological data used for assessing the availability of sufficient credible data for making aquatic life and fisheries beneficial use support determinations.
Data Quality Objectives	Data quality objectives are systematic planning tools based on the scientific method. They are used to develop data collection designs and to establish specific criteria for the quality of data to be collected. This process documents the criteria for defensible decision-making before an environmental data collection activity begins with consideration given to the implication of the decision, schedule for completion, and available resources.
Degradation	A change in water quality that lowers the quality of high quality waters for a parameter. The term does not include those changes in water quality determined to be non-significant pursuant to 75-5-301(5)(c). [75-5-103(5) MCA]
Full support	A beneficial use determination based on sufficient credible data, that a waterbody is achieving all the WQS for the use in question.
Habitat data	See physical and habitat data.
Hydrogeomorphology	The science relating to the geographical, geological, and hydrological aspects of waterbodies, and to changes to these aspects in response to flow variations and to natural and human-caused events, such a heavy rainfall or channel straightening.
Hydrologic Unit Code (HUC)	A standardized mapping system devised by the US Geologic Survey for the hydrology of the United States. The system employs four basic levels of designation or mapping: regions, sub-regions, accounting units, and cataloging units. Each level is assigned a two-digit code so that a cataloging unit has an eight-digit unique identifier, or code. In Montana, there are 100 “8-digit” or “4th code” HUCs.
Impaired waterbody	A waterbody or stream segment for which sufficient credible data shows that the waterbody or stream segment is failing to achieve

	compliance with applicable WQS (nonsupport or partial support of beneficial uses). [75-5-103(11) MCA]
Independent evidence	An approach used to make aquatic life use support determinations when a limited array of chemistry/physical, habitat or biological data provide clear evidence that is sufficient to make a beneficial use support determination.
Integrated Water Quality Report (or Integrated Report)	A report providing an overview of the status of state water quality monitoring and planning programs. It combines in one document the information previously submitted to the EPA in separate 303(d) List and 305(b) Report documents.
Macroinvertebrates	Animals without backbones that are visible to the human eye (insects, worms, clams, and snails).
Montana Water-Use Classification System	Montana State regulations [ARM 17.30.606 - 658] assigning state surface waters to one of nine use classes. The class to which a waterbody is assigned defines the beneficial uses that it should support.
Naturally occurring	Water conditions or material present from runoff or percolation over which humans have no control or from developed land where all reasonable land, soil, and water conservation practices have been applied. [75-5-306(2) MCA]
Nonpoint source	Source of pollution, which originates from diffuse runoff, seepage, drainage, or infiltration. [ARM 17.30.602(18)] NPS pollution is generally managed through BMPs or a water quality restoration plan.
Nonsupport	A beneficial use determination, based on sufficient credible data, that a waterbody is not achieving all the WQS for the use in question, and the degree of water quality impairment is relatively severe.
Overwhelming evidence	Information or data from only one data category that, by itself, constitutes sufficient credible data for making an aquatic life use support determination.
Parameter	A physical, biological, or chemical property of state water when a value of that property affects the quality of the state water. [75-5-103(22) MCA]
Partial support	A beneficial use determination, based on sufficient credible data, that a waterbody is not achieving all the WQS for the use in question, but the degree of impairment is not severe.
Pathogens	Bacteria or other disease causing agents that may be contained in water.

Physical and habitat data	Narrative and photo documentation of habitat conditions, habitat surveys and function rankings, direct measurements of riparian or aquatic vegetation communities, and other measures of hydrogeomorphic characteristics and function.
Point source	A discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, or vessel or other floating craft, from which pollutants are or may be discharged. [75-5-103(24) MCA]
Pollutant	As defined in the federal Clean Water Act, pollutant means dredged spoil; solid waste; incinerator residue; sewage; garbage; sewage sludge; munitions; chemical wastes; biological materials; radioactive materials; heat; wrecked or discarded equipment; rock; sand; cellar dirt; and industrial, municipal, and agricultural waste discharged into water (CWA Section 502(6)).
Pollution	Defined by Montana law [75-5-103(25) MCA] as: 1. Contamination or other alteration of the physical, chemical, or biological properties of state waters that exceed that permitted by Montana WQS, including but not limited to standards relating to changes in temperature, taste, color, turbidity or odor; or, 2. The discharge, seepage, drainage, infiltration, or flow of liquid, gaseous, solid, radioactive, or other substance into state water that will or is likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, or welfare, to livestock, or to wild animals, bird, fish or other wildlife, or 3. Discharge, seepage, drainage, infiltration, or flow that is authorized under the pollution discharge permit rules of the board is not pollution under this chapter. Activities conducted under the conditions imposed by the department in short-term authorizations pursuant to 75 5 308 MCA are not considered pollution under this chapter.
Prioritization	A ranking of impaired waterbodies conducted by DEQ in consultation with the statewide advisory group using established criteria to rank waterbodies as high, moderate, or low priority for preparing Water Quality Restoration Plans (specifically TMDL plans).
Reasonable land, soils, and water conservation practices	Methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include but are not limited to structural and nonstructural controls and operation, and maintenance procedures. Appropriate practices may be applied before, during, or after pollution producing activities. [ARM 17.30.602(21)]
Reference Condition	The condition of a waterbody capable of supporting its present and future beneficial uses when all reasonable land, soil, and water conservation practices have been applied. Reference conditions include

	natural variations in biological communities, water chemistry, soils, hydrology, and other natural physiochemical variations.
Region	See Basin.
Riparian area	Plant communities contiguous to and affected by surface and subsurface hydrologic features of natural waterbodies. Riparian areas are usually transitional between streams and upland.
Segment	A defined portion of a waterbody.
Slickens	A thin layer of extremely fine silt sometimes deposited by floodwaters of a stream.
State water	A body of water, irrigation system, or drainage system, either surface or underground (excludes water treatment lagoons or irrigation waters, which do not return to state waters).
Sub-major basin	The aggregation of several watersheds or HUCs into a larger drainage system. The US Geological Survey has defined 16 sub-major basins (sub-region) in Montana with at least two in each of the Montana basins (regions).
Sufficient credible data	Chemical, physical, or biological monitoring data, alone or in combination with narrative information that supports a finding as to whether a waterbody is achieving compliance with applicable WQS. [75-5-103(30) MCA]
Suspended solids	Materials such as silt that may be contained in water and do not dissolve.
Threatened waterbody	A waterbody for which sufficient credible data and calculated increases in loads show that the water body or stream segment is fully supporting its designated uses but threatened for a particular designated use because of: (a) proposed sources that are not subject to pollution prevention or control actions required by a discharge permit, the nondegradation provisions, or reasonable land, soil, and water conservation practices; or (b) documented adverse pollution trends. [75-5-103(31) MCA]
Total Maximum Daily Load (TMDL)	The sum of the individual waste load allocations for point sources and load allocations for both nonpoint sources and natural background sources established at a level necessary to achieve compliance with applicable WQS. [75-5-103(32) MCA] In practice, TMDLs are water quality restoration targets for both point and nonpoint sources that are contained in a water quality restoration plan or in a permit.

Toxicant	A toxic agent
Waterbody	A lake, reservoir, river, stream, creek, pond, marsh, wetland, or other body of water above the ground surface.
Water Quality Assessment Categories	A system defined by EPA guidance for classifying the water quality status based on the waters' assessment status. The five categories included in this system are: Category 1, Category 2 (2, 2A and 2B), Category 3, Category 4 (4A, 4B, and 4C), and Category 5. Category 1: Waters for which all applicable beneficial uses have been assessed and all uses have been determined to be fully supported. Category 2: Waters for which available data and/or information indicate that some, but not all of the beneficial uses are supported. Subcategory 2A: Available data and/or information indicate that some, but not all of the beneficial uses are supported. Subcategory 2B: Available data and/or information indicate that a water quality standard is exceeded due to an apparent natural source in the absence of any identified anthropogenic sources. Category 3: Waters for which there is insufficient data to assess the use support of any applicable beneficial use, so no use support determinations have been made. Category 4: Waters where one or more beneficial uses have been assessed as being impaired or threatened, however, either all necessary TMDLs have been completed or are not required: Subcategory 4A: All TMDLs needed to rectify all identified threats or impairments have been completed and approved. Subcategory 4B: Waterbodies are on lands where "other pollution control requirements required by local, State, or Federal authority" [see 40 CFR 130.7(b)(1)(iii)] are in place, are expected to address all waterbody-pollutant combinations, and attain all WQS in a reasonable period of time. These control requirements act "in lieu of" a TMDL, thus no actual TMDLs are required. Subcategory 4C: Identified threats or impairments result from pollution categories such as dewatering or habitat modification and, thus, the calculation of a Total Maximum Daily Load (TMDL) is not required. Category 5: Waters where one or more applicable beneficial uses have been assessed as being impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat.
Water quality limited segment (WQLS)	A body of water that is not fully supporting its beneficial uses (an impaired waterbody). If there is no water quality restoration plan with an approved TMDL for a waterbody, it is listed on the 303 (d) List of impaired waters.
Water quality restoration plan	A plan to improve water quality to achieve state WQS. Such a plan may also be referred to as a "TMDL plan" if it addresses the eight criteria used by the EPA to approve TMDL plans.

Water quality standards	the standards adopted in ARM 17.30.601 et seq. and Circular DEQ-7 to conserve water by protecting, maintaining, and improving suitability and usability of water for public water supplies, wildlife, fish and aquatic life, agriculture, industry, contact recreation, and other beneficial uses.
Weight of evidence	An approach used to make aquatic life use support determinations when there are high levels of information from all three data categories (chemistry/physical, habitat and biological), including two biological communities.

¹ ARM 17.30.617(1)

² Chris Kangas, personal communication, 2025

³ Crowley, J.J., LaFave, J.I., Bergantino, R.N., Carstarphen, C.A. and Patton, T.W., 2017, Principal aquifers of Montana: Montana Bureau of Mines and Geology Hydrogeologic Map 11, 1 sheet, scale 1:1,000,000.

⁴ 75-5-303, MCA

⁵ ARM 17.30.701 *et seq.*

⁶ Watershed Protection Section. 2017. Montana Nonpoint Source Management Plan. Helena, MT: Montana Dept. of Environmental Quality.

⁷ Hayes, Steven W.; Townsend, Lucas; Dillon, Thale; Morgan, Todd A.; Shaw, John D. 2021. Montana's forest products industry and timber harvest, 2018. Resour. Bull. RMRS-RB-35. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 54 p. <https://doi.org/10.2737/RMRS-RB-35>.

⁸ Bureau of Economic Analysis (2023). Report of the Outdoor Recreation Satellite Account (ORSA) for the State of Montana. Downloaded 2/20/2025 from: <https://www.bea.gov/data/special-topics/outdoor-recreation>

⁹ Adams A, Byron R, Maxwell B, Higgins S, Eggers M, Byron L, Whitlock C. 2021. Climate change and human health in Montana: a special report of the Montana Climate Assessment. Bozeman MT: Montana State University, Institute on Ecosystems, Center for American Indian and Rural Health Equity. 216 p. <https://doi.org/10.15788/c2h22021>.

¹⁰ U.S. Environmental Protection Agency (EPA). 2016. What Climate Change Means for Montana. EPA 430-F-16-028 <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-mt.pdf#:~:text=As%20the%20climate%20warms%2C%20less%20precipitation%20falls,the%20snowpack%20in%20Montana%20has%20been%20decreasing>

¹¹ Running, S. W. 2008. Impacts of climate change on forests of the Northern Rocky Mountains. University of Montana.

¹² Rood SB, Pan J, Gill KM, Franks CG, Samuelson GM, Shepherd A. 2008. Declining summer flows of Rocky Mountain rivers: changing seasonal hydrology and probably impacts on floodplain forests. J

Hydrol 349:397–410; Isaak, D. J., S. Wollrab, Dona Horan, and G. Chandler. 2012. "Climate change effects on stream and river temperatures across the northwest US from 1980–2009 and implications for salmonid fishes." Climatic change 113 (2012): 499–524.

¹³ ARM 17.30.620 through 17.30.670

¹⁴ MCA § 75-5-303

¹⁵ MCA 75-5-103(14)

¹⁶ MCA § 75-5-702

¹⁷ MCA 75-5-702(7)

¹⁸ Montana Dept. of Environmental Quality. 2018. Montana 2018 Final Water Quality Integrated Report. Helena, MT: Montana Dept. of Environmental Quality.

¹⁹ U.S. Environmental Protection Agency. 2024. *National Lakes Assessment: The fourth collaborative survey of lakes in the United States*. EPA 841-R-24-006. U.S. Environmental Protection Agency, Office of Water and Office of Research and Development. <https://nationallakesassessment.epa.gov/webreport>

²⁰ Year of Open Science. 2023. The Lake Trophic State – US Dataset. U.S. Geological Survey. [https://www.usgs.gov/special-topics/year-of-open-science/news/lake-trophic-state-us-dataset#:~:text=Brown%20lakes%20\(aka%20E2%80%9CDystrophic%20lakes,%2C%20chemical%2C%20and%20biological%20properties](https://www.usgs.gov/special-topics/year-of-open-science/news/lake-trophic-state-us-dataset#:~:text=Brown%20lakes%20(aka%20E2%80%9CDystrophic%20lakes,%2C%20chemical%2C%20and%20biological%20properties)

²¹ Hannah Riedl, Montana DEQ, personal communication, 2025

²² Dieter, C.A., Maupin, M.A., Caldwell, R.R., Harris, M.A., Ivahnenko, T.I., Lovelace, J.K., Barber, N.L., and Linsey, K.S., 2018, Estimated use of water in the United States in 2015: U.S. Geological Survey Circular 1441, 65 p., <https://pubs.usgs.gov/circ/1441/circ1441.pdf> Geological Survey.

²³ Dieter, C.A., Maupin, M.A., Caldwell, R.R., Harris, M.A., Ivahnenko, T.I., Lovelace, J.K., Barber, N.L., and Linsey, K.S., 2018, Estimated use of water in the United States in 2015: U.S. Geological Survey Circular 1441, 65 p., <https://pubs.usgs.gov/circ/1441/circ1441.pdf> Geological Survey.

²⁴ Alan English, MBMG, personal communication, 2025

²⁵ Alan English, MBMG, personal communication, 2025

²⁶ 85-2-901, MCA

²⁷ 85-2-525, MCA

²⁸ John LaFave, MBMG, Personal Communication 12/3/2019

²⁹ Montana Department of Agriculture. 1998. Montana Generic Management Plan: Managing Pesticides to Protect Groundwater. Helena, MT: Montana Department of Agriculture. <https://archive.org/details/montanagenericma1998hele>

³⁰ 80-15-104(3), MCA

- ³¹ Carolyn DeMartino, Montana DEQ, personal communication, 2025
- ³² Terri Dorrington, Montana DEQ, personal communication, 2025
- ³³ Greg Olsen, Montana DEQ, personal communication, 2025
- ³⁴ Greg Olsen, Montana DEQ, personal communication, 2025
- ³⁵ 40 CFR 141.2, ARM 17.38.209, ARM 17.38.219, and Public Water Supply Circular PWS-5
- ³⁶ Erik Englebert, Montana DEQ, personal communication, 2025
- ³⁷ Tatiana Davila and Megan Smith, DEQ, personal communication, 2023
- ³⁸ Michael Abrahamson, Montana DEQ, personal communication, 2023
- ³⁹ Hannah Riedl, Montana DEQ, personal communication, 2025
- ⁴⁰ Hannah Riedl, Montana DEQ, personal communication, 2025
- ⁴¹ Stephen Carpenedo, Montana DEQ, personal communication, 2025
- ⁴² Eric Sivers and Erik Englebert, Montana DEQ, personal communication, 2019 and 2025
- ⁴³ Mike Abrahamson, Montana DEQ, personal communication, 2025
- ⁴⁴ Montana Nonpoint Source Management Program, Montana DEQ, [2021 Annual Report](#) and [2022 Annual Report](#)
- ⁴⁵ Montana Nonpoint Source Management Program, Montana DEQ, [2021 Annual Report](#) and [2022 Annual Report](#)
- ⁴⁶ Montana DEQ, State Fiscal Year 2019 Montana §319 Program Report
- ⁴⁷ Montana DEQ, State Fiscal Year 2020 Montana §319 Program Report
- ⁴⁸ Montana Nonpoint Source Management Program, Montana DEQ, [2021 Annual Report](#) and [2022 Annual Report](#). FY2019 and FY2020, Stephen Carpenedo, DEQ, personal communication, 2025
- ⁴⁹ Montana Nonpoint Source Management Program, Montana DEQ, [2021 Annual Report](#) and [2022 Annual Report](#). FY2019 and FY2020, Stephen Carpenedo, DEQ, personal communication, 2025
- ⁵⁰ Montana Nonpoint Source Management Program, Montana DEQ, [2021 Annual Report](#) and [2022 Annual Report](#). FY2019 and FY2020, Stephen Carpenedo, DEQ, personal communication, 2025
- ⁵¹ Montana Nonpoint Source Management Program, Montana DEQ, [2021 Annual Report](#) and [2022 Annual Report](#). FY2019 and FY2020, Stephen Carpenedo, DEQ, personal communication, 2025
- ⁵² Gregory Montgomery, Montana DEQ, personal communication, 2025
- ⁵³ Camie Westfall, Montana DEQ, personal communication, 2025
- ⁵⁴ Trevor Selch. FWP. Personal Communication 12/19/2019
- ⁵⁵ Trevor Selch. FWP. Personal Communication 12/19/2019
- ⁵⁶ Trevor Selch. FWP. Personal Communication, 5/1/2025
- ⁵⁷ Trevor Selch. FWP. Personal Communication, 5/1/2025
- ⁵⁸ <https://fwp.mt.gov/binaries/content/assets/fwp/fish/regulations/2022-fishing-regulations-final-for-web.pdf>
- ⁵⁹ Trevor Selch. FWP. Personal communication 5/1/2025
- ⁶⁰ Trevor Selch. FWP. Personal communication 5/1/2025
- ⁶¹ Trevor Selch. FWP. Personal communication 5/1/2025
- ⁶² Trevor Selch. FWP. Personal communication 5/1/2025