

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION
WATER PROTECTION BUREAU
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM**

Fact Sheet

General Permit for Domestic Sewage Treatment Lagoons– BATCH DISCHARGERS

FACILITY: Minor Publicly- and Privately- Owned Treatment Works

PERMIT NUMBER: MTG580000

LOCATION: Statewide, except for *Indian Country*

CONTACT: Applicant

RECEIVING WATER: Statewide

I. Status of Permit

This permitting action is the renewal of the Montana Pollutant Discharge Elimination System (MPDES) *General Permit for Domestic Sewage Treatment Lagoons*. This GP has been renewed four times since it was first issued in March 1983. The most recent renewal of this GP became effective on January 1, 2013, and will expire on December 31, 2017 (“2013-issued GP”).

DEQ proposes the following changes with this renewal:

1. The Domestic Lagoon GP will be divided into two General Permits:
 - *Batch Dischargers*. MTG580000 will encompass any control and release dischargers that discharge for *all or part of nine months per year or less*. This fact sheet outlines the methods, facts, and conclusions to support the 2017-issued GP for batch dischargers.
 - *Continuous Dischargers*. DEQ will develop a separate fact sheet and general permit for Domestic Sewage Treatment Lagoons that discharge continuously.
2. DEQ modified the Technology-based Effluent Limits (TBELs). The 2017-issued GP includes the option for Treatment Equivalent to Secondary (TES) limits for 5-Day Biochemical Oxygen Demand (BOD₅) for qualifying facilities. In addition, mass-based Total Suspended Solids (TSS) limits will be allowed to substitute for TSS percent removal for qualifying batch facilities.
3. DEQ updated the units associated with *Escherichia coli* (*E. coli*) effluent limits from colony-forming units (cfu) to number of organisms per 100 mL based on changes in Montana’s Water Quality Standards.

4. Batch dischargers will be prohibited from discharging during the summer period when numeric nutrient criteria apply to their receiving waterbody (typically July 1st to September 30th) (Montana Department Circular DEQ-12A).

II. Description of Discharge and Discharging Facilities

Montana facilities eligible for coverage under the general permit for domestic sewage treatment lagoons have historically been minor facilities with an average daily design flow less than one million gallons per day (mgd). The facilities can be either facultative or aerated lagoon systems. **Attachment A** contains design criteria and receiving water information for the 25 facilities currently authorized under the 2013-issued GP as of April 2017 (all batch and continuous discharging facilities currently permitted under MTG580000, excluding Town of Columbus which has requested individual coverage). In addition, there may be additional lagoon facilities with individual MPDES permits eligible for coverage under the 2017-issued GP.

This permitting action is for the renewal of the Domestic Sewage Treatment Lagoons GP for only **batch dischargers**. A “batch” is a controlled, hold and release periodic discharge strategy that is often seasonal in nature. The 2017-issued GP for batch dischargers will be available for those facilities discharging part or all of nine months per year or less.

A. *Description of Facilities*

All lagoon systems have different engineering designs based on requirements in existence at the time of construction and/or modification:

- *Pre-1995*: the September 1, 1981, Memorandum *Wastewater Treatment Pond Design Guidelines*, from Donald G. Willems, Administrator, Environmental Sciences Division of the Department of Health and Human Services contained requirements for facilities to meet specific design criteria listed in the 1978 Ten States Standards.
- *After 1995*: design criteria contained in the *Circular WQB-2, Montana Department of Environmental Quality, Design Standards for Wastewater Facilities* which was replaced by *Circular DEQ-2, Montana Department of Environmental Quality, Design Standards for Wastewater Facilities* in 1999 and updated several times. The most recent version was issued in 2016.

Facultative Lagoon Systems

A facultative lagoon treatment system consists of treatment ponds, usually constructed of earthen materials. Facultative lagoons are not mechanically mixed or aerated and are designed to provide long detention times. Montana has required 180 days detention for discharging facultative lagoons as part of the design requirements since the early 1980s. According to the *Principles of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers*, EPA/600/R-11/088, August 2011, facultative lagoons provide significant pollutant reductions through passive aerobic/anaerobic treatment, as follows:

- Five-day biochemical oxygen demand (BOD₅): effluent concentrations may range from 20 – 60 mg/L although < 30 mg/L ‘can usually be achieved.’
- Total suspended solids (TSS): effluent concentration range from less than 30 mg/L to greater than 150 mg/L depending on algal concentrations and design parameters.
- Ammonia removal: up to 90% removal is achievable; however this removal rate is not sustainable during colder months.
- Phosphorus removal: approximately 50% removal can be expected under high pH conditions.

Aerated Lagoon Systems and Partial Mix Systems

Aeration is provided by either mechanical surface aerators or submerged diffused aeration systems. Aerated lagoons typically are classified by the amount of mixing provided. A partial mix system provides only enough aeration to satisfy the oxygen requirements of the system and does not provide energy to keep all TSS in suspension. Complete mix systems use approximately ten times the amount of energy as partial mix systems.

According to the 2011 *Principles of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers*, aerated lagoons provide significant pollutant reductions, as follows:

- BOD₅: the EPA literature claims that effluent concentration of < 30 mg/L is typical with up to 95% removal expected.
- TSS: effluent concentrations typically range from 20 – 60 mg/L.
- Significant nitrification occurs during the summer if there is adequate Dissolved Oxygen.
- Phosphorus removal: 15 – 25% expected.

Other Lagoon System Operations – Land Application

A Montana Pollutant Discharge Elimination System (MPDES) permit is not required for facilities that land-apply treated effluent *unless* the facility discharges any treated effluent to state surface water. MPDES permitting is not required for land application alone since DEQ does not consider the use of treated effluent by a properly designed and operated land application system (i.e., in accordance with Circular DEQ-2) to be a discharge.

Facilities must reduce the risk of runoff to surface water or infiltration to ground water by managing the quantity and quality of the land-applied effluent. Applying at agronomic rates in this manner will optimize plant nutrient uptake. To ensure optimal land application conditions, facilities that are otherwise required to have a MPDES permit must also comply with the land application requirements under the Special Conditions section in the 2017-issued GP, as discussed in Part VII.B.2 of this Fact Sheet.

B. Effluent limits

The 2013-issued GP included the following numeric limits on effluent quality (**Table 1**):

Table 1: Numeric Effluent Limits Contained in the “2013-Issued GP”					
Technology-Based Effluent Limits					
Parameter	Units	Monthly Average	Weekly Average	% Removal ⁽¹⁾	
5-day Biochemical Oxygen Demand ⁽²⁾	mg/L	30	45	85%	
	lb/day	<i>Equation 1</i>	<i>Equation 1</i>	--	
Total suspended solids ⁽³⁾	mg/L	<i>a. NSS</i>	30	45	85%
		<i>b. TES</i>	45	65	65%
		<i>c. ASR</i>	100	135	65%
	lb/day	<i>Equation 1</i>	<i>Equation 1</i>	--	
pH	s.u.	6.0 – 9.0		--	
Water Quality-Based Effluent Limits					
Parameter	Units	Monthly Average	Weekly Average	Maximum Daily	
<i>E. coli</i> bacteria – summer ^(4,5)	cfu/100 mL	126	252	--	
<i>E. coli</i> bacteria – winter ^(5,6)	cfu/100 mL	630	1,260	--	
Total Residual Chlorine	µg/L	11	--	19	
Other Parameters (WLA and other previous permit limits)	(7)	(7)	(7)	(7)	
Footnotes:					
(1) Monitoring for % removal was required beginning January 1, 2017.					
(2) Carbonaceous biochemical oxygen demand (CBOD ₅) in lieu of 5-day Biochemical Oxygen Demand (BOD ₅) was permitted upon request of the permittee.					
(3) Facilities’ TSS limits were classified under one of the following categories: (a) National Secondary Standards (NSS), (b) Treatment Equivalent to Secondary (TES), or (c) Alternate State Requirements (ASR).					
(4) After January 1, 2017, all facilities were required to comply with these <i>E.coli</i> limits from April 1 st through October 31 st on an annual basis.					
(5) Facilities required to report geometric mean if more than one sample collected during the reporting period.					
(6) After January 1, 2017, all facilities were required to comply with these <i>E.coli</i> limit from November 1 st to March 31 st on an annual basis.					
(7) Any facility with an existing Wasteload Allocation or effluent limit was required to continue to meet those limits.					

C. Summary of Facility Discharges and Compliance

Table 2, below, summarizes the monthly average BOD₅ and TSS effluent concentrations for the 25 currently permitted under the 2013-Domestic Sewage Lagoon General Permit:

Table 2: Summary of Monthly Average Effluent Concentrations January 2013 – December 2016						
Facility Type	# Facilities	Units	BOD ₅		TSS	
			Range	95 th	Range	95 th
GP Authorizations	19					
Batch Discharge	12	mg/L	7 - 40	40	30 - 95	92
No Discharge	7 ⁽¹⁾	mg/L	ND	ND	ND	ND
Footnote: ND = no data.						
(1) Two of the 'no discharge' facilities had one or more discharges in 2013 but have since ceased: one had a discharge in January 2013; the other discharged three times in 2013.						

The 95th percentile of the monthly average BOD₅ concentration was 40 mg/L for batch dischargers. The calculated 95th percentile for five of the 12 batch discharging facilities could not meet the BOD₅ limit of 30 mg/L for the Period of Record (POR). See Part IV.A.1 of this Fact Sheet for further discussion on BOD₅.

The 95th percentile of the monthly average TSS concentration was 92 mg/L for batch dischargers. See Part IV.A.2 of this Fact Sheet for further discussion on TSS.

The monthly DMRs show an effluent pH range of 5.0 – 10.8 s.u. (the 95th percentile pH range was 5.4 – 9.5 s.u.) Two facilities had a total of three excursions below 6.0 s.u. There were a total of 10 facilities with a total of 34 excursions above 9.0 s.u.

III. Permit Coverage

A. *Coverage Area*

This GP for batch domestic sewage treatment lagoons applies to all areas of the State of Montana, except for within the boundaries of Indian Lands, National Parks, and excluded waterbodies listed in III.D.

B. *Regulatory Authority*

Montana prohibits the discharge of sewage, industrial wastes or other wastes into and state waters without a current permit from DEQ. The authority for DEQ to issue MPDES permits is contained in 75-5-101, Montana Code Annotated (MCA) et seq., with implementing regulations in Administrative Rules of Montana (ARM) 17.30 Subchapter 13.

C. *Sources Eligible for Coverage*

To be eligible for authorization under this 2017-issued GP the domestic sewage treatment lagoon must:

- Be classified as a minor with no pretreatment program and no categorical industrial users (CIU) or significant industrial users (SIU);
- Be designed with an average daily flow less than 1.0 million gallons per day (mgd);
- Discharge effluent as batch or with a periodic discharge strategy; and
- Discharge nine months each year or less.

D. *Sources Ineligible for Coverage*

1. DEQ may deny a general permit application for discharge for any of the following:
 - a. The specific source applying for authorization appears unable to comply with:
 - effluent limitations or other terms and conditions of the permit;
 - water quality standards; or
 - prohibition of any discharges to which the EPA regional administrator has objected in writing.
 - b. The discharge is different in degree or nature from discharges reasonably expected from sources or activities within the category described in the General Permit.
 - c. An MPDES permit or authorization for the same operation has previously been denied or revoked.
 - d. The discharge to be authorized under a general MPDES permit is also included within an application or is subject to review under the Major Facility Siting Act.
 - e. The point source will be located in an area of unique ecological or recreational significance. Such determination must be based upon considerations of Montana stream classifications, impacts on fishery resources, local conditions at proposed discharge sites, and designations of wilderness areas under 16 USC 1132 or of wild and scenic rivers under 16 USC 1274.

2. In addition, the following sources are excluded from coverage from this GP:
 - a. Discharges to Outstanding Resource Waters or to those waterbodies classified as A-1 or A-Closed waters [ARM 17.30.601 *et seq.*].
 - b. The facility is a “new or increased source” that discharges to “high quality water,” as defined in the Nondegradation of Water Quality Subchapter 7 [ARM 17.30.701 *et seq.*].
 - c. The facility is required to have a pretreatment program (see 40 CFR 403.3), or accepts discharge from users that are CIU or SIU.
 - d. Any facility covered under an individual MPDES permit with site-specific WQBELs cannot request coverage under this GP.

E. Requirements for Continuing Authorization under the GP

All authorizations under the 2013-issued GP expire on December 31, 2017, along with the expiration of the GP. For coverage under the 2017-issued General Permit permittees must submit a complete renewal application package. A complete renewal application package must include:

- A complete Notice of Intent application form (NOI-580) provided by DEQ,
- A copy of the consultation letter from the Montana Sage Grouse Habitat Conservation Program (if applicable), and
- Renewal application fee of \$800 per outfall

DEQ must receive the complete application package on or before **December 31, 2017** at the following address:

Department of Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, MT 59620-0901

A facility’s coverage under the 2017-issued GP is effective January 1, 2017, or later, upon receiving an Authorization Letter from DEQ.

F. Requirements for New Authorizations under the General Permit

Existing facilities with coverage under an Individual MPDES permit may obtain first-time coverage under the 2017-issued GP by submitting a complete application package. The application package must include:

- A complete application form Notice of Intent (NOI-580) provided by DEQ,
- A copy of the consultation letter from the Montana Sage Grouse Habitat Conservation Program (if applicable), and
- The appropriate application fee.

A facility’s coverage under the 2017-issued GP is effective January 1, 2017, or later, upon receiving an Authorization Letter from DEQ.

G. Termination of General Permit Coverage

Permittees under the 2017-issued GP may terminate coverage. The permittee must submit a Notice of Termination (NOT) form to DEQ indicating the reason why permit coverage is no longer

required. The permittee remains responsible for all applicable fees including annual fees until DEQ processes and notifies the permittee that permit coverage is terminated. Failure to submit a termination request shall result in accrual of annual fees.

Replace General Permit coverage with an Individual MPDES permit

Permittees under the 2017-issued GP may apply for coverage under an Individual MPDES permit. A facility remains covered under the General Permit until the effective date of the Individual MPDES Permit. Authorization under the General Permit will terminate on the effective date of the Individual MPDES permit.

H. Transfer of Coverage

To transfer permit coverage under the General Permit to a different entity, the owner or operator must submit a complete Permit Transfer Notification form provided by DEQ and a \$500 permit transfer fee. The original owner or operator is responsible for all terms and conditions of the permit until DEQ notifies the new owner.

IV. Technology-based Effluent Limitations

A. *Concentration and Mass-based Limits*

Technology-based Effluent Limits (TBELs) for POTWs are set forth in 40 CFR 133 -- minimum treatment requirements for secondary treatment or equivalent. Secondary treatment is defined in terms of effluent quality as typically measured by BOD₅, TSS, percent removal of BOD₅ and TSS, and pH. Domestic sewage treatment lagoons may be regulated by one of three levels of treatment contained in 40 CFR 133, which DEQ identifies as follows:

- National Secondary Standards (NSS) – default minimum level of effluent quality attainable by secondary treatment [40 CFR 133.102];
- Treatment Equivalent-to-Secondary (TES) – minimum level of effluent quality attainable by *facilities eligible for treatment equivalent to secondary treatment* (a waste stabilization pond that achieves a 30-day average of at least 65% removal of BOD₅ and the facility’s discharge has been shown to meet the *effluent concentration consistently achievable through proper operation and maintenance (O&M)* [40 CFR 133.105]; or
- Alternative State Requirements (ASR) – further adjusted minimum level of TSS for wastewater treatment *that may be allowed when* the principal process for secondary treatment is a waste stabilization pond system that achieves a 30-day average concentration of 45 mg/L BOD₅ or less [40 CFR 133.103(c)].

“Waste stabilization ponds” as referenced in the Secondary Treatment Regulations are now commonly referred to as “wastewater treatment lagoons” which includes both facultative and aerated lagoons.

When EPA has not promulgated a standard for a specific industry, permit limits may be based on best professional judgment (BPJ). Privately-owned sewage treatment works provide the same function and would not have any unique factors or significant technical differences from POTWs that would affect the information published in 49 Federal Register (FR) 37006, September 20, 1984. DEQ determined that BPJ for privately-owned treatment works is the 40 CFR 133 requirements for POTWs.

1. 5-day Biochemical Oxygen Demand concentration-based limits

All of the general permits renewals issued since the original *General Discharge Permit for Facultative Sewage Lagoons* issued in 1983 have required National Secondary Standards (NSS) for 5-day biochemical oxygen demand (BOD₅). Based on literature review, both facultative and aerated lagoons *should* be able to achieve NSS (monthly average of less than 30 mg/L) for effluent BOD₅ concentrations with good design and proper O&M (see Part II.A). However, review of effluent quality between January 2013 and December 2016 shows that the 95th percentile for five of the 12 batch dischargers could not meet NSS for BOD₅ (see **Table 2**).

There is no basis for excluding wastewater treatment lagoon facilities from the TES option. The data shows that the effluent concentration consistently achievable by over a third of the facilities covered under the GP cannot achieve NSS -- as long as proper O&M has been conducted, these facilities would be more appropriately permitted under TES.

Therefore, in order to provide the appropriate regulatory flexibility, DEQ will allow a facility using wastewater treatment lagoons as the primary treatment to comply with TES rather than NSS, provided it meets all of the following criteria as specified under 40 CFR 133.101(g):

- the facility certifies that they have applied good operation & maintenance (O&M),
- the monthly average 95th percentile for the last two to four years is greater than 30 mg/L BOD₅ (except for values attributable to upsets, bypasses, and operational errors or other unusual conditions) and/or the weekly average for the same period is greater than 45 mg/L, and
- the facility achieves a 30-day average of at least 65% removal of BOD₅. The 2013-issued GP included the requirement for all facilities to demonstrate compliance with the BOD₅ (or, if appropriate, CBOD₅) percent removal requirement of 85% no later than January 1, 2017. The removal efficiencies for the 25 authorized facilities were not available at the time of drafting this fact sheet. The equation for percent removal is shown in Part IV.E of this Fact Sheet.

Therefore, each facility covered under this GP will be assigned either NSS or TES for BOD₅, as appropriate. The BOD₅ effluent limits for both categories are listed below.

a. National Secondary Standards

Montana's domestic sewage lagoon general permit has required facilities to meet NSS for BOD₅ since 1983, and it will continue to be the baseline (default) requirement for BOD₅:

- 30 mg/L monthly average,
- 45 mg/L weekly average, and
- 85% removal (see Part IV.E for equation).

b. Treatment Equivalent to Secondary

Treatment Equivalent to Secondary (TES) requirements are contained in 40 CFR 133.105, and allow facilities to meet limits that are slightly relaxed from the NSS. Specifically, facilities subject to TES have the following BOD₅ effluent limits:

- 45 mg/L monthly average;
- 65 mg/L weekly average; and
- 65% removal (see Part IV.E for equation).

c. Carbonaceous Biochemical Oxygen Demand

The total biological oxygen demand of a wastewater is composed of two components – a carbonaceous oxygen demand and a nitrogenous oxygen demand. It has been reported that as much as 60 percent of the BOD₅ violations nationally may have been caused by nitrification in the BOD₅ test rather than by improper design or operation (Hall and Foxen 1983), *Aerated Lagoon Technology*, by Linvil G. Rich, Alumni Professor Emeritus, Dept of Environ. Eng. and Science, Clemson University <http://www.lagoononline.com/technote1.htm>

In lieu of BOD₅ limits, a permittee may request 5-day carbonaceous biochemical oxygen demand (CBOD₅) limits, as follows:

- NSS: 25 mg/L monthly average and 40 mg/L weekly average CBOD₅ [40 CFR 133.102(a)(4)].
- TES: 40 mg/L monthly average and 60 mg/L weekly average CBOD₅ [40 CFR 133.105(e)].

The permittee may make this request as part of the renewal process or a separate modification.

2. Total Suspended Solids concentration-based limits

Until 2013, all of the general permits renewals issued since the original General Discharge Permit for *Facultative Sewage Lagoons* (changed to *Domestic Sewage Treatment Lagoons* in 1999) required facilities to meet the Alternate State Requirements (ASR) effluent limits for Total Suspended Solids (TSS) monthly average of 100 mg/L and weekly average 135 mg/L TSS, without a TSS percent removal requirement. Subsequently, the 2013-issued GP required all applicable facilities, which included both batch and continuous dischargers, to meet NSS effluent limits, unless they demonstrate their eligibility to meet TES or ASR, and added monitoring to meet the TSS percent removal requirement beginning January 1, 2017.

Algal blooms and design problems can cause elevated TSS concentrations even with proper O&M. Based on a review of the DMR data for facilities authorized under the 2013-issued GP, none of the batch discharging facilities could meet NSS (all had the 95th percentile greater than 30 mg/L monthly and/or 45 mg/L weekly averages). The TSS effluent data shows that of the 12 discharging batch facilities, three facilities could meet TES and nine facilities could meet ASR.

For the 2017-issued GP, DEQ will continue to require all facilities to meet NSS for TSS unless they demonstrate their eligibility to meet TES or ASR as detailed below. However, since this GP is proposed to apply only for batch dischargers, DEQ has determined that is not appropriate to continue the TSS percent removal requirement that became effective January 1, 2017. The TSS percent removal requirements in 40 CFR 133 were developed primarily for continuous dischargers. Percent removal loses its significance and is difficult to determine objectively when applied to batch dischargers. Substituting the TSS mass limit for the TSS percent removal limit for batch dischargers is more appropriate.

In summary, the following effluent limits will apply to facilities authorized under the 2017-issued GP for batch dischargers based on their demonstration in the Notice of Intent:

a. National Secondary Standards

The baseline (default) TSS requirement for batch dischargers is NSS effluent limits of:

- 30 mg/L monthly average
- 45 mg/L weekly average, and
- Monthly average mass limit as a substitute for percent removal (see equation in Part IV.E of this Fact Sheet.)

b. Treatment Equivalent to Secondary

Treatment Equivalent to Secondary requirements are contained in 40 CFR 133.105, and allow facilities to meet limits that are slightly relaxed from the National Secondary

Standards. Specifically, batch facilities subject to TES have the following Total Suspended Solids effluent limits:

- 45 mg/L monthly average;
- 65 mg/L weekly average; and
- Monthly average mass limit as a substitute for percent removal (see equation in Part IV.E of this Fact Sheet.)

DEQ has determined that in order to qualify for TES, a facility under the 2017-issued GP must meet all of the following:

- i. The TSS *effluent concentrations consistently achievable through proper operation and maintenance* exceeds the minimum level of effluent quality set forth as NSS [40 CFR 133.101(g)(1)]. This criterion is satisfied if the 95th percentile value for the monthly average TSS concentration in a period of at least two years is greater than 30 mg/L. In addition the applicant must certify that O&M is properly performed on the facility;
- ii. The facility uses a waste stabilization pond as the principle treatment process. Waste stabilization ponds include both facultative and aerated lagoons; and
- iii. The facility provides significant biological treatment. To assure that significant biological treatment is provided, the facility must achieve greater than 65% BOD₅ removal.

c. Alternate State Requirements

Alternate State Requirements for Total Suspended Solids are contained in 40 CFR 133.103(c). The Montana-specific ASR was published in the Federal Register on September 20, 1984 (49 *FR* 37005). Specifically, facilities covered under the 2017-issued GP for batch dischargers that are subject to ASR have the following TSS effluent limits:

- 100 mg/L monthly average;
- 135 mg/L weekly average; and
- Monthly average mass limit as a substitute for percent removal (see equation in Part IV.E of this Fact Sheet.)

DEQ has determined that in order to qualify for TSS ASR, a facility under the 2017-issued GP must meet all of the following:

- i. The TSS *effluent concentrations consistently achievable through proper operation and maintenance* exceeds the minimum level of effluent quality set forth as TES. This criterion is satisfied if the 95th percentile value for the monthly average TSS concentration in a period of at least two years is greater than 45 mg/L. In addition the applicant must certify that O&M is properly performed on the facility;
- ii. The facility uses a waste stabilization pond system. Waste stabilization ponds include both facultative and aerated lagoons; and
- iii. The facility provides significant biological treatment. To assure that significant biological treatment is provided, the facility must achieve 45 mg/L or less BOD₅ concentration on a monthly average basis.

3. Mass-based Effluent Limits (BOD₅/CBOD₅ and TSS)

Facilities are required to meet both concentration-based and mass-based limits [ARM 17.30.1345(8)(a)]. Both monthly and weekly average mass-based (load) limits for BOD₅ (or CBOD₅) and TSS will be calculated individually for each facility, based on a facility's average daily design flow and the monthly and weekly average concentration limits. The equation for calculating mass-based load limits is shown in Part IV.E of this Fact Sheet.

The monthly average mass-based limits for BOD₅ and TSS will be compared against the nondegradation allocated loads and the most stringent for each will be included as the monthly average permit limit.

B. pH

The 2013-issued GP required effluent pH to remain within the range of 6.0 – 9.0 s.u. unless a variation occurred which was due to natural biological processes. The domestic lagoon GP has historically allowed this deviation. However, there is no way for facilities regulated under this GP to demonstrate compliance with this exception. DEQ will remove this exclusion and maintain the pH effluent limit to remain within the range of 6.0 – 9.0 s.u. at all times.

C. Nondegradation Allocated Loads

New or increased sources as defined in Montana's Nondegradation Policy are not eligible for coverage under the 2017-issued GP. Therefore, a new or increased source must apply and obtain coverage under an individual MPDES permit.

Sources that are in compliance with the conditions of their permit and do not exceed the limitations established in the permit or determined from a permit previously issued by DEQ are not considered new or increased sources.

DEQ calculates nondegradation load allocations for parameters with permit limitations in place on April 29, 1993. DEQ has addressed this requirement in the 2013-issued GP by maintaining monthly average BOD₅ and TSS load allocations for each facility based on the most stringent average daily design flow and monthly average BOD₅ and TSS concentration limits since 1993. The 2013-issued GP included BOD₅ and TSS nondegradation allocations for each facility using the equation used to calculate mass-loading (see Part IV.E):

$$\text{Monthly Average Load Allocation (lb/day)} = \text{Most Stringent [avg daily design flow (mgd) x monthly avg concentration limit (mg/L) x 8.34]}$$

If a municipality has seen an increase in either their average design flow or monthly average concentration limit for either BOD₅ or TSS since 1993, resulting in increase in their calculated monthly average load, the more stringent average monthly load will be maintained.

D. Proposed Technology Based Effluent Limits

Technology-based Effluent Limits (TBELs) are required to be met after treatment, prior to any dilution with groundwater or surface water. Compliance monitoring must be conducted at the end-of-pipe, prior to release into any channel or receiving water.

DEQ will assign one of the following TBEL subcategories to each facility as part of their renewal authorization letter, based on the information provided as part of the renewal:

Group A – Total Suspended Solids (TSS) -National Secondary Standards (see Table 3)

5-Day Biochemical Oxygen Demand (BOD₅)

A.1. National Secondary Standards

A.2. Treatment Equivalent to Secondary

Group B – Total Suspended Solids (TSS) - Treatment Equivalent to Secondary (see Table 4)

5-Day Biochemical Oxygen Demand (BOD₅)

B.1. National Secondary Standards

B.2. Treatment Equivalent to Secondary

Group C – Total Suspended Solids (TSS) - Alternate State Requirements (see Table 5)

5-Day Biochemical Oxygen Demand (BOD₅)

C.1. National Secondary Standards

C.2. Treatment Equivalent to Secondary

Table 3. Proposed Technology-based Effluent Limits Group A- Total Suspended Solids – National Secondary Standards ⁽¹⁾				
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Rationale
Choices for 5-day Biochemical Oxygen Demand (BOD₅) ⁽²⁾				
A.1. BOD ₅ - National Secondary Standards	mg/L	30	45	40 CFR 133.102(a)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	85 ⁽⁴⁾	NA	
A.2. BOD ₅ - Treatment Equivalent to Secondary	mg/L	45	65	40 CFR 133.105(a)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	65 ⁽⁴⁾	NA	
Total Suspended Solids				
Total Suspended Solids	mg/L	30	45	40 CFR 133.102(b)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	NA ⁽⁴⁾	NA	
pH ⁽⁵⁾	s.u.	6.0-9.0 (instantaneous)		40 CFR 133.102(c)
Footnotes:				
1. See Definitions section at end of permit for explanation of terms.				
2. CBOD ₅ limits contained in 40 CFR 133.102(a)(4) may replace BOD ₅ limits if requested by the permittee as part of the renewal application process or a modification request and approved by DEQ.				
3. Mass-based limits calculations shown below in Part IV.E.				
4. BOD ₅ percent removal calculation shown below in Part IV.E. TSS mass limits are a substitute for TSS percent removal.				
5. Effluent pH shall remain between 6.0 and 9.0 s.u. For compliance purposes, any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit.				

Table 4. Proposed Technology-based Effluent Limits Group B - Total Suspended Solids Treatment Equivalent to Secondary ⁽¹⁾				
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Rationale
Choices for 5-day Biochemical Oxygen Demand (BOD₅) ⁽²⁾				
B.1. BOD ₅ - National Secondary Standards	mg/L	30	45	40 CFR 133.102(a)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	85 ⁽⁴⁾	NA	
B.2. BOD ₅ - Treatment Equivalent to Secondary	mg/L	45	65	40 CFR 133.105(a)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	65 ⁽⁴⁾	NA	
Total Suspended Solids (TSS)				
Total Suspended Solids	mg/L	45	65	40 CFR 133.105(b)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	NA ⁽⁴⁾	NA	
pH ⁽⁵⁾	s.u.	6.0-9.0 (instantaneous)		40 CFR 133.102(c)
Footnotes:				
1. See Definitions section at end of permit for explanation of terms.				
2. CBOD ₅ limits contained in 40 CFR 133.102(a)(4) may replace BOD ₅ limits if requested by the permittee as part of the renewal application process or a modification request and approved by DEQ.				
3. Mass-based limits calculations shown below in Part IV.E.				
4. BOD ₅ percent removal calculation shown below in Part IV.E. TSS mass limits are a substitute for TSS percent removal.				
5. Effluent pH shall remain between 6.0 and 9.0 s.u. For compliance purposes, any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit.				

Table 5. Proposed Technology-based Effluent Limits Group C - Total Suspended Solids Alternate State Requirements ⁽¹⁾				
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Rationale
Choices for 5-day Biochemical Oxygen Demand (BOD₅) ⁽²⁾				
C.1. BOD ₅ - National Secondary Standards	mg/L	30	45	40 CFR 133.102(a)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	85 ⁽⁴⁾	NA	
C.2. BOD ₅ - Treatment Equivalent to Secondary	mg/L	45	65	40 CFR 133.105(a)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	65 ⁽⁴⁾	NA	
Total Suspended Solids (TSS)				
Total Suspended Solids	mg/L	100	135	40 CFR 133.103(c)
	lbs/day	⁽³⁾	⁽³⁾	
	% removal	NA ⁽⁴⁾	NA	
pH ⁽⁵⁾	s.u.	6.0-9.0 (instantaneous)		40 CFR 133.102(c)
Footnotes:				
1. See Definitions section at end of permit for explanation of terms.				
2. CBOD ₅ limits contained in 40 CFR 133.102(a)(4) may replace BOD ₅ limits if requested by the permittee as part of the renewal application process or a modification request and approved by DEQ.				
3. Mass-based limits calculations shown below in Part IV.E.				
4. Percent BOD ₅ percent removal calculation shown below in Part IV.E. TSS mass limits are a substitute for TSS percent removal.				
5. Effluent pH shall remain between 6.0 and 9.0 s.u. For compliance purposes, any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit.				

E. TBEL Equations

The following two equations – mass-based load and percent removal calculations -- will be included as part of the 2017-issued GP to clarify how authorized facilities must demonstrate compliance.

1. Mass-based Load Limits Equation

The following equations are used by DEQ to develop a facility's mass-based load limits:

Monthly average load limit (lb/day) ⁽¹⁾

= avg daily design flow (mgd) x monthly avg concentration limit (mg/L) x 8.34 conversion

Weekly average load limit (lb/day)

= avg daily design flow (mgd) x weekly avg concentration limit (mg/L) x 8.34 conversion

Footnote: (1) If a facility's nondegradation allocated load is more restrictive (for instance the average design flow for the facility anytime since 1993 was lower than the current design flow), then the nondegradation allocated load for that facility will supersede the mass-based monthly average load limit. Limiting each facility to the nondegradation monthly load allocation will ensure nonsignificance.

The same basic equations are used by the facility to calculate their actual loads for a given period of time, typically for monthly DMRs:

Monthly load (lb/day) – *average of all loading values calculated within the month:*

= Monthly average [actual daily discharge (mgd) x actual daily concentration (mg/L) x 8.34]

Weekly load (lb/day) – *highest average weekly loading value calculated within the month:*

= Highest (average weekly [actual daily discharge (mgd) x actual daily concentration (mg/L) x 8.34])

2. Percent Removal Equation

The following equation is used for a facility to determine their percent removal for a given month (or other time period):

$$\% \text{ Removal} = \frac{[\text{Influent Concentration}] - [\text{Effluent Concentration}]}{[\text{Influent Concentration}]} \times 100$$

Where:

Influent Concentration = Corresponding monthly average influent concentration based on the analytical results of the reporting period.

Effluent Concentration = Corresponding monthly average effluent concentration based on the analytical results of the reporting period.

V. Water Quality-Based Effluent Limitations

A. *Scope and Authority*

No permit may be issued when the imposition of conditions cannot ensure compliance with the applicable water quality requirements. In addition, Montana water quality standards require that no wastes may be discharged such that the waste either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard. DEQ develops Water Quality-based Effluent Limits (WQBELs) when a discharge has the reasonable potential to exceed any state water quality standard and TBELs are not adequate to achieve water quality standards.

B. *Receiving Waters*

The 2017-issued GP covers facility discharges outside the boundaries of Indian Lands to any *state surface waters* except for Outstanding Resource Waters or those classified as A-1 or A-Closed waters (see Fact Sheet Part III.D.2).

'State waters' are defined as any body of water, irrigation system or drainage system either on the surface or underground. State waters do not include ponds or lagoons used solely for treating, transporting, or impounding pollutants; or irrigation waters or land application disposal waters when the waters are used up within the irrigation or land application disposal system and the waters are not returned to state waters. Channels used solely for conveyance of wastewater discharges are considered part of the domestic lagoon system and are not regulated as state surface waters; therefore, compliance monitoring for any water-quality based effluent limits may be conducted at any location after treatment but prior to mixing with state surface water.

C. *Applicable Water Quality Standards*

Applicable discharges to state surface waters are subject to the specific water quality standards in ARM 17.30.623 - .629, Department Circulars DEQ-7 (Numeric Water Quality Standards) and -12A (Base Numeric Nutrient Standards), and the general provisions of ARM 17.30.635 through 637. All dischargers must ensure that state waters are free from substances which will:

- (i) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
- (ii) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 mg/L), or globules of grease or other floating materials;
- (iii) produce odors, colors, or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
- (iv) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant, or aquatic life; and
- (v) create conditions which produce undesirable aquatic life.

Total Maximum Daily Load

For this renewal, the 2016 Integrated Report listed 16 authorized facilities' receiving waterbodies as impaired. The 2016 Integrated Report list of impaired waterbodies includes both those waterbodies where beneficial uses are impaired by a pollutant (e.g., sediment, nutrients, metals, temperature) and waterbodies impaired by a non-pollutant (e.g., alteration in stream-side or littoral vegetative covers, low flow alterations). DEQ develops Total Maximum Daily Loads (TMDLs) for waterbodies with pollutant impairments. Wasteload Allocations (WLAs) that are assigned to point sources in the TMDL are incorporated into MPDES permits, consistent with the assumptions and requirements in the TMDL document.

DEQ reviewed those TMDLs and WLAs that impact the 19 currently authorized facilities which are expected to apply for renewal under the 2017-issued GP. There were three batch discharges that had a narrative WLA in one or more TMDLs. The TMDLs conclude that lagoons are small contributors when properly designed and operated. Therefore, proper operation and maintenance achieves the WLAs of the applicable facilities. The 2017-issued GP includes conditions requiring the proper operation and maintenance of the facility.

D. Mixing Zones

A mixing zone is an area where the effluent mixes with the receiving water and certain water quality standards may be exceeded [ARM 17.30 Subchapter 5 *et seq.*]. No mixing zone will be granted that will impair beneficial uses. When mixing zones are granted they are on a parameter-by-parameter basis.

No mixing zones were granted for any of the authorized facilities as part of the 2013-issued GP; instead, monitoring was required for parameters of concern. For this renewal cycle, DEQ evaluated the dischargers eligible for coverage under the batch discharger GP. Any mixing zones given to facilities will be discussed in Part V.E.2 of this Fact Sheet.

E. Basis for Water Quality Based Effluent Limits

DEQ develops Water Quality Based Effluent Limits (WQBELs) for any pollutant of concern (POC) for which there is reasonable potential (RP) to cause or contribute to exceedances of instream numeric or narrative water quality standards. Pollutants and parameters are identified as POC for one or more of the following reasons:

- listed Technology-based Effluent Limits;
- identified as needing limits in the previous permit;
- identified as present in the effluent through monitoring or otherwise expected present in the discharge; or
- associated with a pollutant impairment (with or without a wasteload allocation [WLA]) in a Total Maximum Daily Load document.

DEQ evaluated pollutants for the domestic sewage lagoon category in **Table 7**.

Table 7. Identification of Pollutants of Concern	
Parameter	Basis for Pollutant of Concern Identification
5-day Biochemical Oxygen Demand ⁽¹⁾	Technology based Effluent Limits, previous permit
Total Suspended Solids	Technology based Effluent Limits, previous permit
pH	Technology based Effluent Limits, previous permit
Oil & Grease	Known present
<i>E.coli</i>	Previous permit, known present
Total Residual Chlorine	Previous permit, known present
Ammonia, as N	Known present
Nitrate+Nitrite, as N	Known present
Total Nitrogen, Total Phosphorus	Known present
Other Parameters (WLA and other previous permit limits)	Previous permit
Footnotes:	
(1) Permittees may request 5-day carbonaceous biochemical oxygen demand (CBOD ₅) in lieu of BOD ₅ .	
(2) Numeric nutrient standards have been implemented for wadeable streams and two (2) downstream segments of the Yellowstone River, as of April 2017.	

1. Reasonable Potential (RP)

The following subsections discuss the basis for the RP analyses and WQBELs in this permit.

a. TSS, CBOD₅/BOD₅, and pH –

Each facility regulated under this GP will be required to meet TBELs which provide a significant reduction in solids and biological material through the TSS and CBOD₅/BOD₅ effluent limits (see Part IV). In addition, the TBEL effluent limitation for pH of 6.0 – 9.0 s.u. is protective of any receiving water quality. No additional WQBELs are required for these parameters.

b. Oil and Grease –

Discharges are prohibited from creating floating debris, scum, a visible oil sheen (or creates oil present in concentrations at or in excess of 10 mg/L), or globules of grease or other floating material in the receiving stream. Sewage treatment lagoons covered under this GP include minor batch dischargers with no significant industrial contribution. However, oil & grease (O&G) is a parameter that could be present at a relatively low level in the wastewater from miscellaneous commercial sources.

Each authorized facility was required to analyze oil and grease concentrations annually during the current period of record. The highest concentration observed for the four years (2013 through 2016) was 12 mg/L oil & grease by one facility; however this facility had non-detects for the following two years. Other facilities ranged from nondetect up to 5.0 mg/L with the overall average oil & grease concentration at 2.3 mg/L.

Based on this data, the batch discharging facilities authorized under the 2013-GP do not have RP to exceed 10 mg/L oil. Each facility authorized under this GP will be required to

visually monitor their discharge a minimum of three times per week during periods of discharge. If there is a visual sign of an oil sheen or presence of oil, the facility must immediately take an oil & grease sample for analysis. The facility must also take all necessary steps to prevent the discharge of oil and grease, including but not limited to ceasing discharge.

c. *Escherichia coli*–

State surface water must be free from substances attributable to discharges that will create conditions harmful to human health. This includes pathogens. Pathogen limits are defined in terms of *Escherichia coli* (*E. coli*).

E.coli standards are a surrogate for all human pathogens including bacteria and viruses. Water quality criteria for *E. coli* are expressed in colony forming units per 100 milliliters of water (cfu/100 mL) or as most probable number (MPN), which is a statistical representation of the number of organisms in a sample, as incorporated by reference in 40 CFR 136.3(b). The standards are expressed as follows:

- April 1 through October 31 of each year - the geometric mean number of *E. coli* must not exceed 126 colony forming units (cfu) per 100 milliliters (mL) and 10% of the total samples may not exceed 252 cfu per 100 mL during any monthly period; and
- November 1 through March 31 of each year - the geometric mean number of *E. coli* must not exceed 630 cfu per 100 mL and 10% of the total samples may not exceed 1,260 cfu per 100 mL during any monthly period.

DEQ required all discharges covered by the 2013-issued GP to meet the *E. coli* effluent limits at the last point of control as of January 1, 2017. DEQ proposes to retain these limits for the 2017-issued GP, but will change the associated units to read “number of organisms/100 mL,” which will incorporate both cfu and MPN. DEQ has determined that in order to protect human health, *all* discharges must meet the *E. coli* limit after treatment but prior to discharge into state waters. **Table 8** provides the *E.coli* effluent limits that will be included in each authorization:

Table 8: Proposed <i>Escherichia Coli</i> Bacteria Effluent Limits ⁽¹⁾			
Parameter	Units	Average Monthly Limit	Average Weekly Limit
<i>E. coli</i> Bacteria – summer ^(2,3)	# organisms/100 mL	126	252
<i>E. coli</i> Bacteria – winter ^(3,4)	# organisms /100 mL	630	1,260

Footnote:
 (1) See Definitions section at end of permit for explanation of terms.
 (2) This limit applies during the period April 1 through October 31, annually.
 (3) Report the geometric mean if more than one sample collected during the reporting period.
 (4) This limit applies during the period November 1 through March 31, annually.

d. Total Residual Chlorine –

Facilities may disinfect with chlorine. The total residual chlorine (TRC) chronic aquatic life standard is 0.011 mg/L (11 µg/L) and the acute aquatic life standard is 0.019 mg/L (19 µg/L) [Department Circular DEQ-7]. The TRC standards were included as end-of-pipe TRC

effluent limits in the 2013-issued GP. No facility had TRC concentrations above the 2012 Required Reporting Value (RRV) of 0.10 mg/L (100 µg/L).

TRC analysis was based on the size of the facility.

- **≤0.10 mgd batch dischargers** –this subcategory includes batch dischargers with an average daily design flow up to 0.10 mgd. Half of the facilities can be considered non-discharging, and the other half discharge less than 3 months annually. Of those that discharge, their discharge is so miniscule that it infiltrates upon release or in some cases enters such a large river that impact would be undetectable. As a result, there is no reasonable potential to cause or contribute to a TRC exceedance.
- **>0.10 mgd batch dischargers** – this subcategory includes batch dischargers with an average daily design flow greater than 0.10 mgd. Currently, the majority of the facilities in this category do not have reasonable potential because they either do not discharge, their discharge would immediately infiltrate given the low volume, or their discharge enters such a large river compared to the discharge that the impact would be undetectable.

A couple facilities discharge to predominantly dry waterbodies that are occasionally wet due to seasonally high ground water. Given the hold and release nature of these dischargers and that no facility has ever exceeded the RRV, each of these facilities can be managed such that the discharges infiltrate or are of such low volume that TRC would rapidly decay to where there is no reasonable potential to cause or contribute to an TRC exceedance.

Effluent limits and monitoring will not be required in the 2017-issued GP.

e. Nutrients –

For the 2017-issued GP for batch dischargers, all facilities authorized under the batch Domestic Sewage Treatment Lagoon GP are prohibited from discharging to state surface water during the time period that the nutrient criteria apply to a given receiving waterbody (**July 1st – September 30th** unless otherwise noted in the facility's authorization letter).

f. Total Ammonia as Nitrogen (Ammonia) –

Ammonia aquatic life acute and chronic toxicity are dependent on ambient pH and water temperature data for the receiving water body as well as the type of fishery present as presented in Circular DEQ-7. The 2013-issued GP did not include ammonia limits, but did require upstream and effluent monitoring.

Ammonia analysis will be based on the size of the facility.

- **≤0.10 mgd batch dischargers** –this subcategory includes batch dischargers with an average daily design flow up to 0.10 mgd. Half of the facilities can be considered non-discharging and the other half discharge less than 3 months annually. Of those that discharge, their discharge is so miniscule that it infiltrates upon release or in some cases enters such a large river that impact would be undetectable. As a result, there is no reasonable potential to cause or contribute to an ammonia exceedance.

- **>0.10 mgd batch dischargers** – this subcategory includes batch dischargers with an average daily design flow greater than 0.10 mgd. Currently, the majority of the facilities in this category do not have reasonable potential because they either do not discharge, their discharge would immediately infiltrate given the low volume, or their discharge enters such a large river compared to the discharge that the impact would be undetectable.

A couple facilities discharge to predominantly dry waterbodies that are occasionally wet due to seasonally high ground water. Given the hold and release nature of these dischargers, each of these facilities can be managed such that the discharges infiltrate or are of such low volume that ammonia would rapidly decay to where there is no reasonable potential to cause or contribute to an ammonia exceedance.

Effluent limits and monitoring will not be required in the 2017-issued GP.

g. Nitrate + Nitrite –

The human health standard (HHS) for nitrate + nitrite is 10 mg/L. The 2013-issued GP required each permittee to monitor their effluent and upstream nitrate + nitrite concentrations during this permit cycle. Nitrate+nitrite analysis will be based on the size of the facility.

- **≤0.10 mgd batch dischargers** –this subcategory includes batch dischargers with an average daily design flow up to 0.10 mgd. Half of the facilities can be considered non-discharging and the other half discharge less than 3 months annually. Of those that discharge, their discharge is so miniscule that it infiltrates upon release or in some cases enters such a large river that impact would be undetectable. As a result, there is no reasonable potential to cause or contribute to a nitrate + nitrite exceedance.

- **>0.10 mgd batch dischargers** – this subcategory includes batch dischargers with an average daily design flow greater than 0.10 mgd. Currently, the majority of the facilities in this category do not have reasonable potential because they either do not discharge, their discharge would immediately infiltrate given the low volume, or their discharge enters such a large river compared to the discharge that the impact would be undetectable.

A couple facilities discharge to predominantly dry waterbodies that are occasionally wet due to seasonally high ground water. These facilities are on average well below the HHS for nitrate + nitrite. Given the low concentration in the discharges and the hold and release nature of these dischargers, each of these facilities can be managed such that there is no reasonable potential to cause or contribute to a nitrate + nitrite exceedance.

Effluent limits and monitoring will not be required in the 2017-issued GP.

h. Whole Effluent Toxicity (WET) –

Facilities that maintain authorization to discharge under the 2017-issued GP do not require WET limits or testing based on the following rationale:

- No industrial users and indirect dischargers contributing to the influent;
- The requirement that facilities have flows of less than 1 mgd; and
- Other applicable effluent limits contained in this permit.

VI. Effluent Limits

Effluent limitations or conditions in reissued permits are required to be at least as stringent as those in the existing permit, with certain exceptions. DEQ considered the proposed permit limits to ensure that they were as stringent as previous limits, or met the anti-backsliding requirements.

Beginning on the effective date and lasting through the term of the 2017-issued GP, the discharge from each facility shall, at a minimum, meet the effluent limits presented below. The limits for each are comprised of the appropriate TBELs and WQBELs. These limits and the outfall location for each facility will be identified in a authorization letter.

A. *TBELs:*

Each facility will be assigned BOD₅, TSS, and pH limits in their authorization letter, based on the appropriate TBEL category (i.e. Group A.1, A.2, B.1, etc.).

Group A – Total Suspended Solids (TSS) -National Secondary Standards (see Table 3)

5-Day Biochemical Oxygen Demand (BOD₅)

A.1. National Secondary Standards

A.2. Treatment Equivalent to Secondary

Group B – Total Suspended Solids (TSS) - Treatment Equivalent to Secondary (see Table 4)

5-Day Biochemical Oxygen Demand (BOD₅)

B.1. National Secondary Standards

B.2. Treatment Equivalent to Secondary

Group C – Total Suspended Solids (TSS) - Alternate State Requirements (see Table 5)

5-Day Biochemical Oxygen Demand (BOD₅)

C.1. National Secondary Standards

C.2. Treatment Equivalent to Secondary

B. *WQBELs:*

In addition to the TBELs, each facility is also subject to WQBELs. Beginning on the effective date of the permit and ending with the expiration of this permit, each facility will be subject to WQBELs as shown below in **Table 9 and below**. These limits apply to *all* batch dischargers (both ≤ 0.10 mgd and >0.10 mgd).

Table 9. Water Quality-based Effluent Limits for All Batch Dischargers ⁽¹⁾				
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
<i>E. coli</i> bacteria – summer ⁽²⁾	# organisms/100 mL	126	252	--
<i>E. coli</i> bacteria – winter ⁽²⁾	# organisms/100 mL	630	1,260	--
Oil & Grease	mg/L	--	--	10 ⁽³⁾
Other Parameters (WLA and other previous permit limits)	mg/L or µg/L	⁽⁴⁾	--	⁽⁴⁾

Footnotes:

(1) See Definitions section at end of permit for explanation of terms. WQBELs are in addition to TBELs for all batch dischargers.

(2) All facilities are required to comply with the summertime *E.coli* bacteria limit from April 1 through October 31 and the wintertime limit from November 1 through March 31st on an annual basis. The geometric mean must be reported if more than one sample is collected during the reporting period.

(3) If visual monitoring indicates the presence of oil & grease, a grab sample must be submitted for analysis and discharge must cease if the concentration is found to be > 10 mg/L.

(4) Any facility with an existing WLA or effluent limit will be required to continue to meet these limits. The additional requirements will be specified in the authorization letter to the facility.

In addition to **Table 9**, all batch discharging facilities must meet the following restrictions:

1. There shall be no discharge which causes a visible oil film (or to be present at concentrations at or in excess of 10 mg/L), and
2. There shall be **no discharge during the period when numeric nutrient criteria in Circular DEQ-12A apply to the facility's receiving waterbody** -- typically between July 1st – September 30th, with the following exceptions that must be specified in the authorization letter:
 - a. If DEQ determines the discharge is to an ephemeral waterbody or other waterbody that does not have numeric nutrient criteria, or
 - b. If another time period is determined to be appropriate for a specific facility's ecoregion.

VII. Monitoring and Reporting Requirements and Special Conditions

A. *Effluent Monitoring*

Each facility is required to monitor their discharge at the last point of control before the discharge enters the initial receiving water. All facilities must ensure flow monitoring is representative of the nature and volume of the discharge. DEQ requires monitoring to occur on a calendar basis (i.e., calendar week, calendar month, calendar quarter). When monitoring is required twice per month, the two samples must be taken at least one week apart during the calendar month. When monitoring is required more than once a week, each sample must be taken on a unique calendar day.

Samples must be representative of the volume and quality of the effluent. Samples shall be collected, preserved and analyzed in accordance with approved procedures listed in 40 CFR 136 unless otherwise specified by DEQ. Analytical results reported as less than detection must achieve the required reporting values (RRV) in Department Circular DEQ-7 unless a different reporting level (RL) is specified in the 2017-issued GP.

Reporting frequency shall be monthly, and each facility must submit the results on their DMR for each month by the 28th of the following month. If no discharge occurs during the reporting period, “no discharge” shall be reported on the DMR.

Review of the universe of facilities potentially covered under the 2017-issued GP indicates that monitoring frequency is more appropriately separated into the following:

1. Dischargers \leq 0.1 mgd average daily design flow – **Table 10 (Influent) and Table 11 (Effluent)**
2. Dischargers $>$ 0.1 mgd average daily design flow - **Table 10 (Influent) and Table 12 (Effluent)**

Table 10 presents the influent monitoring requirements for all batch dischargers:

Table 10: Influent Monitoring and Reporting Requirements for Batch Dischargers ⁽¹⁾					
Parameter	Units	Sample Type	Minimum Sampling Frequency ⁽²⁾	Reporting Requirements	Reporting Level ⁽³⁾
5-Day Biochemical Oxygen Demand (BOD ₅) ⁽⁴⁾	mg/L	Composite	1/Month	None	2
Footnotes:					
(1) See Definitions section in the permit. Influent monitoring required for both all dischargers.					
(2) The influent concentration of BOD ₅ is used to calculate the percent removal. Monthly influent samples are required whenever there is a discharge for that month.					
(3) Reporting Level (RL) is the minimum reporting level required for the analysis.					
(4) BOD ₅ unless facility has requested to sample for Carbonaceous Biochemical Oxygen Demand (CBOD ₅)					

2. **Effluent Monitoring and Reporting for Dischargers less than or equal to 0.1 mgd**

Table 11 presents the proposed monitoring requirements for batch dischargers (less than or equal to 0.1 mgd average daily design flow) under the 2017-issued GP.

Table 11: Effluent Monitoring and Reporting Requirements for ≤0.1 mgd Batch Dischargers ⁽¹⁾

Parameter	Units	Sample Type	Minimum Sampling Frequency ⁽²⁾	Reporting Requirements	Reporting Level ⁽³⁾
Discharge Flow Rate	mgd	Instantaneous <i>or</i> Continuous	3/Week	Daily Maximum and Monthly Average	± 10% of actual
Number of Days with Discharge	#Days	Calculated	1/Day	Monthly Count	1
5-Day Biochemical Oxygen Demand ⁽⁴⁾	mg/L	Grab	1/Month	Weekly Maximum and Monthly Average	2
	lb/day	Calculated	1/Month		0.1
	% Removal	Calculated	1/Month	Minimum Monthly	0.1
Total Suspended Solids	mg/L	Grab	1/Month	Weekly Maximum and Monthly Average	10
	lb/day	Calculated	1/Month		0.1
pH	s.u.	Instantaneous	3/Week	Daily Minimum and Daily Maximum	0.1
Oil & Grease	Yes / No	Visual ⁽⁵⁾	3/Week	Monthly	--
	mg/L	Grab	⁽⁵⁾	Daily Maximum	1
<i>E. coli</i> Bacteria ⁽⁶⁾	# organisms/ 100 mL	Grab	1/Month	Daily Maximum and Geometric Mean	1
PARAMETERS W/ LIMITS OR MONITORING	µg/L	Grab	TBD ⁽⁷⁾	Daily Maximum and Monthly Average	DEQ-7

Footnotes:

- (1) See Definitions section in the permit.
- (2) **Monitoring is required only for any calendar period where there is a discharge.** Methods for calculating mass load (lb/day) and % removal are provided in Parts IV.E.1 & 2. Permittees are allowed to either conduct grab or composite effluent sampling: composite samples are 24-hour composite samples using a minimum of four grab samples. *DEQ will presume the permittees will comply with the monitoring requirement by taking one grab sample unless otherwise indicated in the NOI and specified in the authorization letter.*
- (3) RL = minimum reporting level. Analytical results reported as less than detection must achieve the required reporting values (RRV) in Department Circular DEQ-7 unless a different RL is specified.
- (4) BOD₅ unless the facility is authorized to demonstrate compliance with carbonaceous biochemical oxygen demand (CBOD₅).
- (5) If visual monitoring indicates the presence of oil & grease, a grab sample must be submitted for analysis and discharge must cease if the concentration is found to be > 10 mg/L.
- (6) *Escherichia coli* (*E. coli*) bacteria. Reporting in #organisms per 100 mL (equivalent to either colony forming units (cfu) per 100 mL or most probable number (mpn) per 100 mL). Report the geometric mean if more than one sample is collected during the reporting period.
- (7) To be determined – the monitoring frequency depends upon the TMDL WLA or previous permit requirements.

3. Effluent Monitoring and Reporting for Dischargers greater than 0.1 mgd

Table 12 presents the proposed monitoring requirements for batch dischargers greater than 0.1 mgd average daily design flow under the 2017-issued GP.

Table 12: Effluent Monitoring and Reporting Requirements for >0.1 mgd Dischargers ⁽¹⁾

Parameter	Units	Sample Type	Minimum Sampling Frequency ⁽²⁾	Reporting Requirements	Reporting Level ⁽³⁾
Discharge Flow Rate	mgd	Instantaneous <i>or</i> Continuous	5/Week	Daily Maximum and Monthly Average	± 10% of actual
Number of Days with Discharge	#Days	Calculated	1/Day	Monthly Count	1
5-Day Biochemical Oxygen Demand ⁽⁴⁾	mg/L	Grab	2/Month	Weekly Maximum and Monthly Average	2
	lb/day	Calculated	1/Month		0.1
	% Removal	Calculated	1/Month	Monthly Minimum	0.1
Total Suspended Solids	mg/L	Grab	2/Month	Weekly Maximum & Monthly Average	10
	lb/day	Calculated	1/Month		0.1
pH	s.u.	Instantaneous	5/Week	Daily Minimum and Daily Maximum	0.1
Oil & Grease	Yes / No	Visual ⁽⁵⁾	5/Week	Monthly	--
	mg/L	Grab	⁽⁵⁾	Daily Maximum	1
<i>E. coli</i> Bacteria ⁽⁶⁾	# organisms/100 mL	Grab	2/Month	Daily Maximum and Geometric Mean	1
PARAMETERS W/ LIMITS or MONITORING	µg/L	Grab	TBD ⁽⁷⁾	Daily Maximum and Monthly Average	DEQ-7

Footnotes:

- (1) See Definitions section in the permit.
- (2) **Monitoring is required only for any calendar period where there is a discharge.** Methods for calculating mass load (lb/day) and % removal are provided in Parts IV.E.1 & 2. Permittees are allowed to either conduct grab or composite effluent sampling: composite samples are 24-hour composite samples using a minimum of four grab samples. *DEQ will presume the permittees will comply with the monitoring requirement by taking one grab sample unless otherwise indicated in the NOI and specified in the authorization letter.*
- (3) RL = minimum reporting level. Analytical results reported as less than detection must achieve the required reporting values (RRV) in Department Circular DEQ-7 unless a different RL is specified.
- (4) BOD₅ unless the facility is authorized to demonstrate compliance with carbonaceous biochemical oxygen demand (CBOD₅).
- (5) If visual monitoring indicates the presence of oil & grease, a grab sample must be submitted for analysis and discharge must cease if the concentration is found to be > 10 mg/L.
- (6) *Escherichia coli* (*E. coli*) bacteria. Reporting in #organisms per 100 mL (equivalent to either colony forming units (cfu) per 100 mL or most probable number (mpn) per 100 mL). Report the geometric mean if more than one sample is collected during the reporting period.
- (7) To be determined – the monitoring frequency depends upon the TMDL WLA or previous permit requirements.

B. Special Conditions/Compliance Schedule

1. Lagoon O&M Requirements – All Facilities

ARM 17.30.1342(5) states that a permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. One of the Special Conditions under the 2013-issued GP, as well as the proposed 2017-issued GP for batch dischargers, is the requirement for every facility to maintain and operate in accordance with an up-to-date Operations & Management (O & M) Plan. Therefore, DEQ proposes to continue to include the requirement for each permitted facility to:

- a. Maintain an up-to-date O&M manual for the domestic sewage treatment lagoon system;
- b. Follow the procedures in the O&M manual;
- c. **Conduct inspections at least monthly** to ensure the O&M procedures are being followed and are working; and
- d. Maintain records of the routine inspections and any follow-up. Records from the routine inspections must be maintained for at least three (3) years, and available for an inspector upon request. At a minimum, the records shall include:
 - Date and time of inspection;
 - Name of the inspector(s);
 - Weather conditions during inspection;
 - Visual observation of lagoon conditions, including wastewater observations (water level, odor, and visible appearance) and dike condition (signs of leakage, erosion, rodents burrowing, and/or vegetation growth);
 - Discharge flow rate, if occurring;
 - Identification of O&M problems;
 - Recommendations, as appropriate, to rectify identified O&M problems;
 - A brief description of any actions taken with regards to identified problems; and
 - Other information, as appropriate (e.g., effluent sample and measurement location).

2. Seasonal Land Application of Treated Effluent

Any authorized facilities that employ land application are required to incorporate good operating procedures for the treated effluent land application system into the facility's final O&M manual as a Land Application Nutrient Management Plan (NMP). The NMP shall be designed to minimize the potential for release of pollutants to state waters. The plan shall detail how the facility will control land-applied effluent to optimize nutrient uptake and eliminate the risk of runoff to surface water or ground water infiltration/ percolation. Each facility shall maintain land application records for three (3) years and make them available for inspection by DEQ personnel upon request.

3. Additional Requirement for Facilities with average daily design flow greater than 0.1 mgd average daily design flow) - Inflow/Infiltration

The 2017-issued GP will require an update on the status of Infiltration/Inflow (I/I) for batch facilities with an average daily design flow greater than 0.1 mgd. The status update must be submitted during the last year of the permit cycle and include at a minimum:

- date of the most recent I/I assessment (which may be before this permit cycle),
- work completed since the most recent I/I assessment,
- work planned to reduce I/I over the next five years, and
- best estimate of the current amount and sources of I/I into the collection system.

A summary of the facility's most recent I/I review must be completed by **July 1, 2022** and submitted to DEQ.

4. Special Conditions Summary

Table 13 presents a summary of Special Conditions due dates.

Table 13: Summary of Special Conditions and Due Dates		
Action	Action Completion Due Date⁽¹⁾	Report Due Date⁽²⁾
Batch Dischargers - ALL		
Operation & Maintenance Plan and records.	Continual	Maintain for three years.
Land application – Plan and records (<i>if applicable</i>)	Continual	Maintain for three years.
Additional Requirements for Dischargers with average daily design flow greater than 0.1 mgd		
Review I/I and provide status update.	July 1, 2022	July 14, 2022
Footnotes: (1) The actions must be completed on or before the scheduled completion dates. (2) This notification must be received by DEQ on or before the scheduled due date.		

C. Sludge Requirements

The use or disposal of sewage sludge must be in conformance with 40 CFR Part 503.

D. Pretreatment Program

Facilities that operate under the EPA Pretreatment Program or accept discharge from categorical industrial users, significant industrial users, or other users that may cause pass through or interference, cannot be covered under the 2017-issued GP. The GP will include standard language restricting the introduction of certain pollutants into the authorized facilities and requiring a facility to provide adequate notice to DEQ if a new source, volume, or character of industrial pollutant is introduced into the system.

VIII. Information Sources

1. Montana Code Annotated Title 75 - Chapter 5 - Water Quality
2. Administrative Rules of Montana Title 17 Chapter 30 - Water Quality
 - a. Subchapter 2 - Water Quality Permit and Application Fees
 - b. Subchapter 5 - Mixing Zones in Surface and Ground Water
 - c. Subchapter 6 - Montana Surface Water Quality Standards and Procedures
 - d. Subchapter 7- Nondegradation of Water Quality
 - e. Subchapter 11 - Storm Water Discharges
 - f. Subchapter 12 - MPDES Standards
 - g. Subchapter 13 - MPDES Permits
3. Montana Department of Environmental Quality Circular DEQ-2, Design Standards for Wastewater Facilities, September 2016.
4. Montana Department of Environmental Quality Circular DEQ-7, Montana Numeric Water Quality Standards, May 2017.
5. Montana Department of Environmental Quality Circular DEQ-12A, Montana Base Numeric Nutrient Standards, July 2014
6. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MTG580000: Administrative Record.
7. Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.
8. Federal Water Pollution Control Act (Clean Water Act), § 303(d), 33 USC 1313(d) Montana List of Waterbodies in Need of Total Maximum Daily Load Development, 2016.
9. Federal Register, 49 FR 37005 Alternative State Requirements for Montana, September 20, 1984.
10. US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.
11. US Code of Federal Regulations, 40 CFR Part 403 – General Pretreatment Regulations for Existing and New Sources of Pollution.
12. US Code of Federal Regulations, 40 CFR Part 503 – Standards for the Use or Disposal of Sewage Sludge.
13. US Department of the Interior US Geological Survey, Statistical Summaries of Streamflow in Montana and Adjacent Areas, Water Years 1900 through 2002, Scientific Investigations Report 2004-5266, 2004 and final electronic update through 2009, dated 2016.
14. US EPA. Office of Water. Design Manual for Municipal Wastewater Stabilization Ponds, EPA 625-1-83-015. October 1983.
15. US EPA. Principles of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers, EPA/600/R-11/088, August 2011.
16. US EPA Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-30-001, March 1991.
17. US EPA NPDES Permit Writers' Manual, EPA 833-K-10-001, September 2010.