



Water Protection Bureau  
 P.O. Box 200901  
 Helena, MT 59620-0901

## PERMIT FACT SHEET

### MONTANA GROUND WATER POLLUTION CONTROL SYSTEM (MGWPCS)

Permittee:	Sussex Development Inc
Permit Number:	MTX000210
Permit Type:	Domestic wastewater
Application Type:	Renewal
Facility Name:	Heron Creek Subdivision
Facility Location:	NW ¼, Section 12, Township 10 North, Range 2 West Lewis and Clark County Latitude: 46.64320° Longitude: -111.80340°
Facility Address:	3811 Eames Lane, Helena MT 59602
Facility Contact:	Ron Bartsch - Owner
Treatment Type:	Level 2
Receiving Water:	Class I Ground Water
Number of Outfalls:	1
Outfall / Type:	001 / subsurface drainfield
Effluent Type:	Domestic strength wastewater
Mixing Zone:	Standard
Effluent Limit Type:	Technology based
Effluent Limit:	Total nitrogen: 5.45 lbs/day
Flow Rate:	Design maximum: 27,250 gpd Design average: 21,800 gpd
Effluent sampling:	Quarterly sampling for effluent
Ground water sampling:	Quarterly, MW-2 and MW-3
Fact Sheet Date:	March 2026
Prepared By:	M. Peziol

## **1.0 PERMIT INFORMATION**

The following fact sheet outlines the basis for issuing a Montana Ground Water Pollution Control System (MGWPCS) wastewater discharge permit to Ron Bartsch (Permittee) for the Heron Creek Subdivision (Facility). The MGWPCS permit application and supplemental materials provide the information that serves as the bases for the development of the effluent limits and the monitoring requirements outlined within this fact sheet. The scope of this permitting action is for the operation and maintenance of the wastewater treatment and disposal system.

DEQ issues MGWPCS permits for a period of five years. The permit may be renewed at the end of the period, subject to timely application, reevaluation of compliance, water quality, and operations and maintenance.

### **1.1 PERMIT APPLICATION**

DEQ received a renewal application for the permit on May 2, 2019, along with the required renewal fees. Following review, DEQ issued a completeness letter on May 28, 2019, identifying the need for additional ambient ground water data, including two additional sampling events and documentation of the monitoring well location and well log. The requested information was received on February 24, 2026.

### **1.2 PERMIT HISTORY**

DEQ first issued MGWPCS permit MTX000210 for Heron Creek Subdivision wastewater treatment facility in 2009. The permit authorized discharge of treated domestic wastewater to subsurface drainfields associated with Outfall 001. The disposal system consists of two drainfields zones, designated as Outfall 001a and 001b, that infiltrate Class I ground water.

DEQ determined the discharge constituted a new source under ARM 17.30.702 (18) and conducted a nondegradation significance determination. The Department concluded the discharge would result in nonsignificant degradation when operating within permit limits. The permit authorized a standard 500-foot mixing zone for nitrate for each drainfield zone and established nutrient limits including total nitrogen (5.45 lbs/day) and total phosphorus (840 lbs/year) based on phosphorus breakthrough analysis.

DEQ renewed the permit in 2014. Because the facility design, discharge volume, and pollutants remained unchanged, an additional significance determination was not required, and the renewal retained the existing mixing zone authorization and nutrient limits.

### **1.3 CHANGES TO THIS PERMIT**

This permit establishes a ground water monitoring well network consisting of two downgradient monitoring wells near the downgradient boundary of the mixing zones associated with Outfall 001a and Outfall 001b. The monitoring wells will be used to assess ground water quality downgradient of the permitted discharge.

Previous permits included a total phosphorus effluent limitation derived from a phosphorus breakthrough evaluation. The analysis estimated breakthrough to beyond the 50-year significance

threshold in ARM 17.30.715(1)(e), indicating the discharge is nonsignificant with respect to phosphorus. Because this permit does not increase discharge volume or modify the disposal configuration, a numeric effluent limitation for total phosphorus is not included in this permit.

## 2.0 FACILITY INFORMATION

### 2.1 LOCATION

The Heron Creek Subdivision wastewater treatment system is located in northern Helena Valley, northeast of the City of Helena in Lewis and Clark County, Montana (**Figure 1**). The facility treats domestic wastewater generated by the Heron Creek Subdivision, a residential development consisting of approximately 109 residential lots located near the intersection of Keir Lane and Eames Lane.

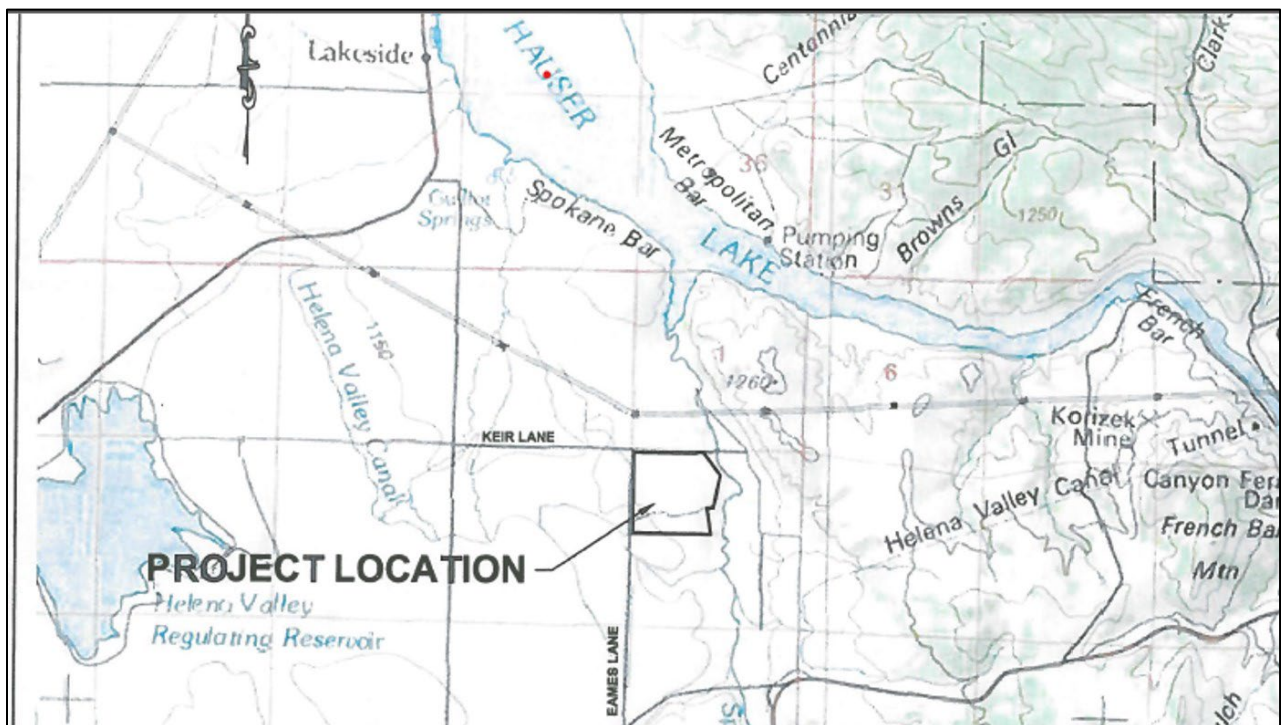


Figure 1. Regional Location of the Heron Creek Subdivision near Helena, Montana.

### 2.2 OPERATIONS

All wastewater generated by the Heron Creek Subdivision flows to a centralized community wastewater treatment and disposal system. Wastewater is generated from domestic residential sources within the subdivision, which consists of single-family homes and condominium units. No commercial or industrial wastewater is received.

Each lot provides primary treatment through a septic tank. Effluent from the septic tank flows by gravity through a six-inch collection main to a centralized treatment system. Secondary treatment is provided

by an Advantex AX-100 recirculating trickling filter. Wastewater passes through two recirculation tanks and then to a 4,000-gallon lift station.

Treated effluent is transferred from the lift station to two 3,400-gallon dose tanks and pressure dosed to subsurface drainfields for disposal. Discharge occurs through one permitted discharge structure, Outfall 001, which consists of two drainfield zones (001a and 001b).

System operations are summarized below in **Table 1**. **Figure 2** shows the location of Outfall 001 a and b and **Figure 3** a line diagram of the wastewater treatment system.

<b>Table 1: Collection, Treatment, and Disposal System Summary for MTX000210</b>
<b>Sources and Treatment</b>
Contributing Sources: Domestic-in-Nature, Residential Strength Standard Industrial Code(s) (SIC): 1521 Treatment System: Level 2, Advantex AX-100 Recirculating Trickling Filter Location: Section 12, T10N, R2W Lewis and Clark County
<b>Sampling/Monitoring</b>
Wastewater System EFF-001: Effluent sampling location at the drainfield dose tank. FM-001: Flow monitoring location at a magnetic flow meter, immediately after the recirculating trickling filter and prior to the lift station.
<b>Disposal System</b>
Disposal Structure: Outfall 001, subsurface drainfield Coordinates: Lat 46.64306°, Long -111.80389° Average Daily Design Flow: 21,800 gpd Daily Maximum Design Flow: 27,250 gpd

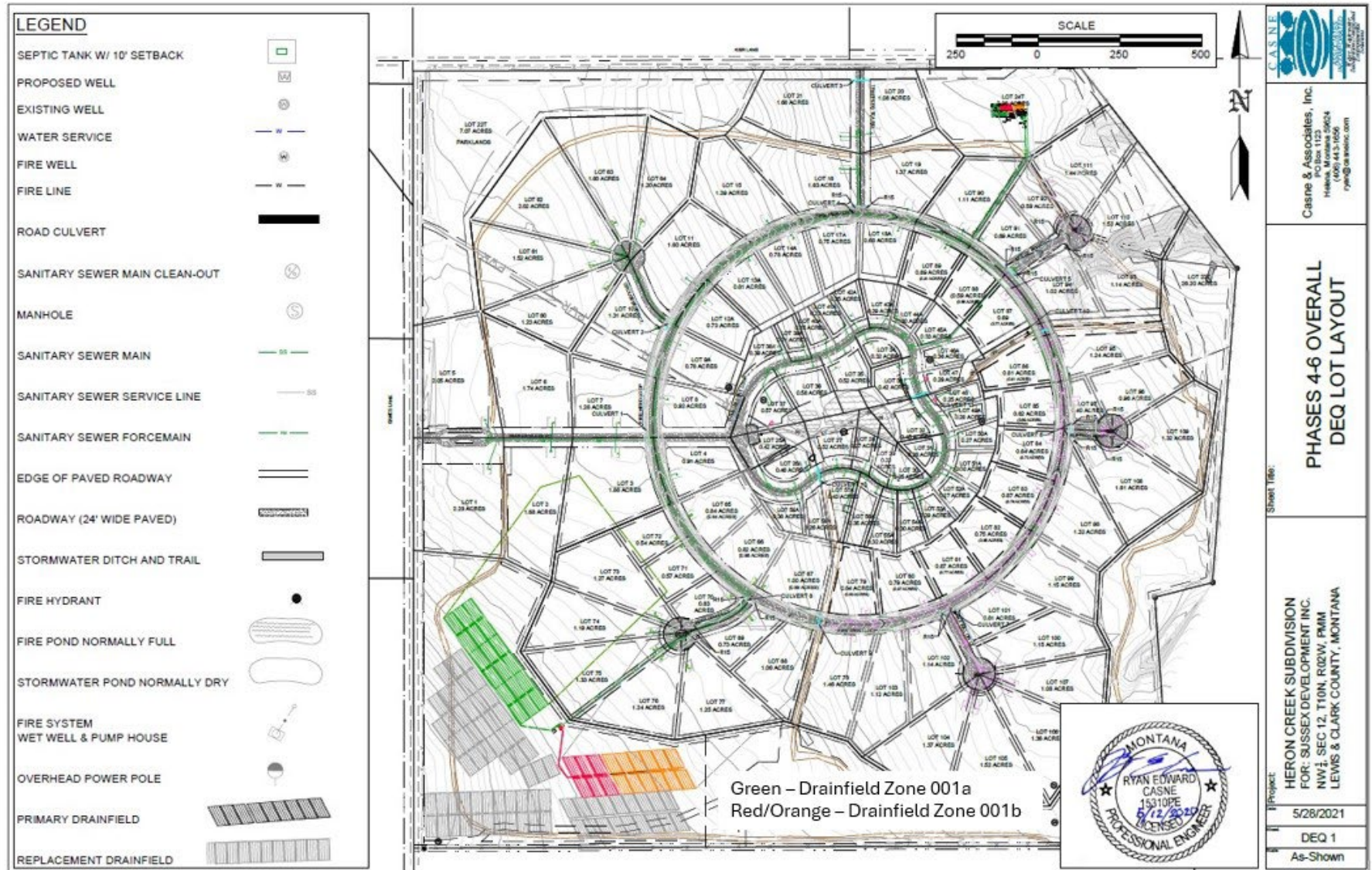
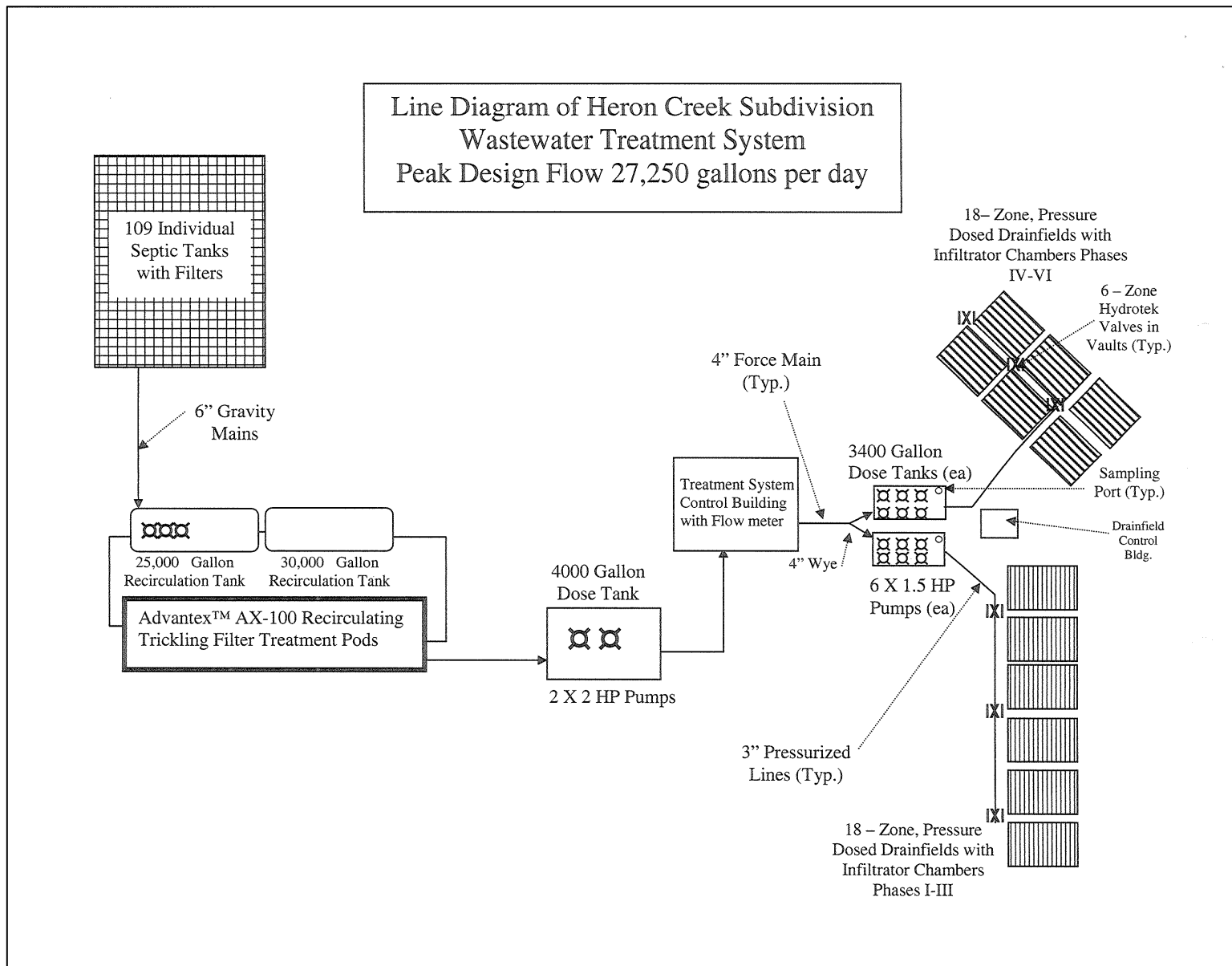


Figure 2. Wastwater Treatment System and Drainfield Layout – Heron Creek Subdivision.



**Figure 3: Wastewater Treatment System Line Diagram - Heron Creek Subdivision.**

## 2.3 GEOLOGY/HYDROGEOLOGY

A summary of the site geology and ground water characteristics are provided in **Table 2**.

<b>Table 2: Site Hydrogeology and Receiving Water Characteristics - MTX000210</b>	
<b>Parameter</b>	<b>Description</b>
Geologic Setting	The Heron Creek Subdivision is underlain by unconsolidated Quaternary alluvial deposits typical of the Helena Valley. Subsurface materials encountered in onsite well logs consist of sandy silt near ground surface, underlain by fine to medium grain sized sand with increasing gravel content at depth.
Aquifer Type	Ground water occurs in a shallow, unconfined alluvial aquifer.
Depth to Ground Water	Depth to ground water in the vicinity of the drainfields is approximately 50 to 60 feet below ground surface, based on the onsite well data.
Hydraulic Conductivity (K)	Aquifer testing conducted during initial permit development estimated an average hydraulic conductivity of 140 feet per day.
Hydraulic Gradient (I)	The hydraulic gradient in the area is approximately 0.023 feet per foot.
Ground Water Flow Direction	Ground water flows generally to the northeast (approximately N41°E), based on ground water elevations measured in onsite wells.
Receiving Water Classification	The receiving water for Outfall 001 is Class I ground water, as defined by ARM 17.30.1006.
Nearest Surface Water	The nearest surface water body is Spokane Creek, located approximately 2,250 to 3,200 feet downgradient of the drainfields, based on ground water flow direction.

## 2.4 GROUND WATER MONITORING NETWORK

An upgradient monitoring well, MW-1 (GWIC ID: 2400628), is used to characterize ambient ground water quality in the vicinity of the facility. Well location and construction information is provided in **Table 3**, and a map showing monitoring well location is provided in **Figure 4**. Well lithology and construction diagrams are provided in **Appendix A**.

Two monitoring wells will be installed near the downgradient boundary of the mixing zones for Outfall 001a and Outfall 001b to monitor ground water quality of the shallow aquifer. Final monitoring well locations and coordinates will be established upon installation and are subject to DEQ review and approval. Proposed monitoring well information is summarized in **Table 3**.

If a DEQ-approved monitoring well is abandoned, destroyed or decommissioned, or becomes unsuitable for sampling due to fluctuations in the ground water table, the permittee must install or designate a replacement well.

<b>Table 3. Monitoring Well Summary - MTX000210</b>
Monitoring Well: MW-01 MBMG GWIC ID: 2400628 Permit Status: Existing Construction date: December 11, 2007 Location: NW ¼ SW ¼, Section 12, Township 10 North, Range 2 West Coordinates: 46.637488° N, -111.805688° W Representation: Ambient ground water quality.
Monitoring Well: MW-02 MBMG GWIC ID: Permit Status: To be constructed Location: Near the downgradient boundary of the mixing zone. Coordinates: Representation: Downgradient ground water quality at the mixing zone boundary for Outfall 001a.
Monitoring Well: MW-03 MBMG GWIC ID: Permit Status: To be constructed Location: Near the downgradient boundary of the mixing zone. Coordinates: Representation: Downgradient ground water quality at the mixing zone boundary for Outfall 001b.



Heron Creek Subdivision  
Location of Monitoring Well  
T10N, R02W S12 NW1/4  
NTS



Figure 4: Monitoring Well Location – Heron Creek Subdivision.

## 2.5 QUALITY INFORMATION

Effluent monitoring data submitted through Discharge Monitoring Reports from December 31, 2022, through December 31, 2025, were reviewed to characterize wastewater quality from the facility. A summary of the estimated effluent characteristics is provided in **Table 4**.

<b>Table 4: Estimated Effluent Quality for Outfall 001 - MTX000210</b>						
<b>Parameter (1)</b>	<b>Location</b>	<b>Units</b>	<b>Reported Minimum Value</b>	<b>Reported Maximum (2) Value</b>	<b>Reported Average (3) Value</b>	<b>2014 Permit Limit</b>
Biochemical Oxygen Demand (BOD <sub>5</sub> )	EFF-001	mg/L	7.2	166.0	59.0	
Nitrogen, Nitrate + Nitrite (as N)	EFF-001	mg/L	0.02	1.28	0.19	
Nitrogen, Total Ammonia (as N)	EFF-001	mg/L	1.9	69.1	69.1	
Nitrogen, Total Kjeldahl (as N)	EFF-001	mg/L	40.7	105.0	60.0	
Nitrogen, Total (as N)	EFF-001	mg/L	40.7	106.3	60.2	
		lbs/day	2.14	6.83	3.71	5.45 lbs/day
Phosphorus, Total (as P)	EFF-001	mg/L	6.5	8.7	7.5	10.13 mg/L
Total Suspended Solids (TSS)	EFF-001	mg/L	10	41	21	
<p>Footnotes:</p> <p>Source of data: Discharge Monitoring Reports (DMRs) submitted to Montana DEQ.</p> <p>DMRs reporting period: from December 31, 2022, through December 31, 2025.</p> <p>CFU = Colony Forming Unit</p> <p>EFF-001: See Table 1</p> <p>FM-001 = See Table 1</p> <p>s.u. = standard units</p> <p>(1) Conventional and nonconventional pollutants only, this table does not include all potential toxic pollutants.</p> <p>(2) Daily Maximum: Highest reported concentration during the reporting period.</p> <p>(3) The median value is displayed for the parameters with a skewed, variable, or limited dataset; otherwise, average is reported.</p> <p>For statistical calculations, concentrations reported below the laboratory reporting limit were substituted with the reporting limit values (0.1 mg/L for nitrate + nitrite and 10 mg/L for TSS).</p> <p>Total nitrogen values were verified by recalculation as a sum of total Kjeldahl nitrogen and nitrate + nitrite concentrations.</p>						

Ambient ground water quality data for the shallow aquifer were collected from Monitoring well MW-1 (GWIC ID: 2400628) on April 17, 2019, July 22, 2019, and October 16, 2019. A summary of the data is provided in **Table 5**. Well information is included in **Appendix A**.

<b>Table 5: Ambient Ground Water Monitoring Results – MTX000210</b>					
<b>Monitor Source (1)</b>	<b>Parameter</b>	<b>Units</b>	<b>Reported Minimum Value</b>	<b>Reported Maximum (2) Value</b>	<b>Reported Average Value</b>
MW-01	Specific Conductivity (@ 25°C)	µS/cm	524	536	529
	Total Dissolved Solids (TDS)	mg/L	305	313	309
	pH	s.u.	7.9	8.0	8.0
	Chloride (as Cl)	mg/L	11.0	13.0	12.0
	Escherichia coli	CFU/100 mL	<1	<1	<1
	Nitrogen, Total Kjeldahl (as N)	mg/L	ND	ND	ND
	Nitrogen, Nitrate + Nitrite (as N)	mg/L	0.01	1.17	0.72
	Total Organic Carbon (TOC)	mg/L	1.0	1.0	1.0
Footnotes:					
Source of data: Applicant submitted information provided to Montana DEQ.					
Collection dates: April 17, 2019, July 22, 2019, and October 16, 2019.					
ND = Not detected at laboratory reporting limits. For statistical calculations, non-detect results were assigned the laboratory reporting limit (0.5 mg/L for total Kjeldahl nitrogen and 0.01 mg/L for nitrate + nitrite).					
CFU = Colony Forming Units.					
s.u. = standard units.					
(1) All samples were collected from a single upgradient monitoring well. Refer to <b>Section 2.4</b> of the Fact Sheet for monitoring well location.					
(2) Maximum value recorded of all monthly or quarterly reported values.					

## 3.0 WATER QUALITY STANDARDS

Part of DEQ's mission is to protect, maintain, and improve the quality of state waters. Water quality standards provide the basis for limitations that protect state waters. These include maintenance of designated beneficial uses, specific water quality standards, and the State nondegradation policy. DEQ protects all designated uses of state water by basing effluent limitations on the most restrictive water quality standards intended to protect the most sensitive uses.

### 3.1 BENEFICIAL USES

The receiving state water is Class I ground water which is a high-quality water of the state. The current and future beneficial uses of the aquifer will must be protected. The beneficial uses and water quality standards necessary to protect those uses are listed below.

Beneficial uses:

- Public and private water supplies;
- Culinary and food processing purposes;
- Irrigation;

- Drinking water for livestock and wildlife; and,
- Commercial and industrial purposes.

Water quality standards are established to protect these beneficial uses. The applicable standards include the following:

- Ground water human health standards in DEQ 7;
- No increase in any parameter that renders receiving water harmful, detrimental, or injurious to the beneficial uses designated for Class I groundwater in ARM 17.30.1006; and,
- No increase of a parameter that causes violation of the nondegradation provisions in § 75-5-303, MCA.

DEQ protects all of the assigned beneficial uses by protecting the most sensitive. The most restrictive standard will be used in formulating limitations (**Section 5**). The corresponding numeric and narrative standards are listed in **Table 6**.

<b>Table 6: Water Quality Standards</b>				
<b>Parameter (1)</b>	<b>Units</b>	<b>Ground Water Human Health Standards</b>	<b>Pollutant Category (2)</b>	<b>Nonsignificance Criteria (3)</b>
Bacteria [ <i>Escherichia coli</i> ]	CFU/100 mL	< 1	-	-
Nitrogen, Nitrate + Nitrite [as N]	mg/L	10.0	T	7.5
Nitrogen, Total (TN) (4)	mg/L	-	-	7.5
Phosphorus, Total Inorganic	-	-	H	Surface water breakthrough time greater than 50 years (5)

Footnotes:  
 CFU = Colony Forming Units.  
 These standards establish the allowable changes in ground water quality and are the basis for limiting discharges to ground water.  
 (1) Includes identified parameters of concern.  
 (2) Circular DEQ-7 pollutant categories: Carcinogen (C), Harmful (H), and Toxic (T).  
 (3) Nonsignificance criteria indicates threshold for determining whether an activity that may result in significant degradation.  
 (4) DEQ conservatively assumes all forms of nitrogen discharged to ground water will convert to nitrate within the aquifer. Total nitrogen is therefore used to evaluate potential impacts and establish effluent limitations.  
 (5) Changes in receiving ground water quality are not significant if water quality protection practices approved by DEQ have been fully implemented and the nonsignificance criteria are met (ARM 17.30.715).

### 3.2 NONDEGRADATION

Montana’s nondegradation policy is intended to preserve the existing condition of high-quality state waters. Any water with existing conditions better than the water quality standards must be maintained at that high quality. The nondegradation policy allows discharges to cause only nonsignificant changes in water quality.

Activities that cause a significant change in water quality may not be authorized without an authorization to degrade. See 75-5-303(3), MCA. The permittee has not requested nor received an authorization to degrade. **Figure 5** illustrates the relationship between water quality standards, nondegradation and nonsignificant changes in water quality.

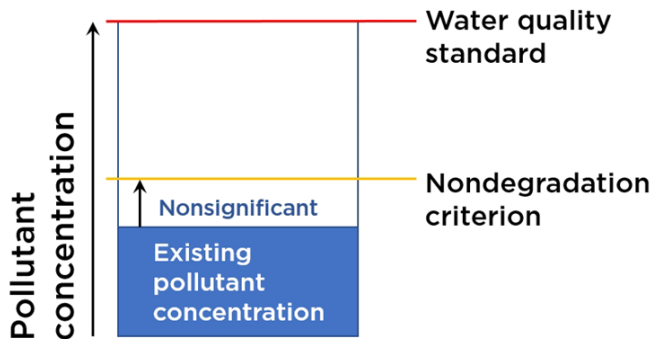


Figure 5: Pollutant Loading and Nondegradation Relationship.

### 3.3 SIGNIFICANCE CRITERIA AND DETERMINATION

Changes of nitrate as nitrogen in ground water are nonsignificant if the discharge will not cause degradation of surface water and the predicted concentration of nitrate as nitrogen at the boundary of the ground water mixing zone does not exceed 7.5 mg/L (ARM 17.30.715(1)(d); §§ 75-5-301(5)(c) and (d), MCA; 75-5-317(2)(u), MCA). DEQ establishes effluent limitations and monitoring requirements to ensure compliance at the end of the mixing zones (**Section 5**).

DEQ performed a significance determination using a mass balance model incorporating updated ambient ground water quality data, mixing zone geometry, aquifer characteristics, and the facility’s design capacity. The ambient nitrate + nitrite concentration (as N) used in the evaluation was 1.17 mg/L, based on the maximum measured background concentration.

The projected nitrate concentration at the downgradient boundary of the mixing zone is 2.93 mg/L under full design capacity conditions. Because the projected concentration does not exceed the 7.5 mg/L nonsignificance threshold, the discharge is considered nonsignificant pursuant to ARM 17.30.715 (1)(d) and §§ 75-5-301(5)(c) and (d), MCA.

Previous permits evaluated phosphorus transport from the drainfield to the nearest downgradient surface water (Spokane Creek). The analysis assumed both drainfields function as a single source due to their proximity and similar orientation and estimated a phosphorus breakthrough time of approximately of 82.4 years. Because this exceeds the 50-year significance threshold in ARM 17.30.715(1)(e), the discharge was determined to result in a nonsignificant change in water quality. The current permit

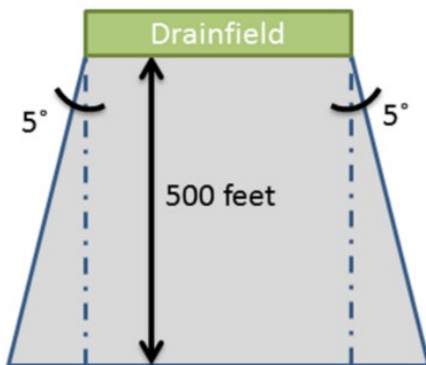
renewal does not increase discharge volume or change the disposal configuration; therefore, the previous phosphorus breakthrough analysis remains applicable.

These analyses show that the discharge activity authorized by the permit is not significant. The discharge permit requires that the permittee comply with these established permit effluent limitations on a long-term basis.

## 4.0 MIXING ZONE

A mixing zone is a defined area of the receiving shallow ground water where wastewater mixes with and is diluted by the aquifer. Within the mixing zone, water quality standards may be exceeded provided that standards are met at the downgradient border. The availability of dilution is based on the site-specific aquifer characteristics and the drainfield dimensions. The extent of dilution is determined by site-specific aquifer characteristics and drainfield geometry.

DEQ previously authorized a standard mixing zone for the combined discharge from Outfall 001a and 001b. This permit retains the standard mixing zone. A standard mixing zone extends 500 feet downgradient from the source. The upgradient boundary is equal to the width of the source (measured perpendicular to the ground water flow direction). For Heron Creek Subdivision, the combined width of the two drainfields perpendicular to groundwater flow is 815 feet (430 feet and 385 feet). Consistent with the 2014 permit, the combined drainfield width was used to represent the discharge as a single source for mixing zone calculations. The mixing zone widens in the downgradient direction by 5° on either side. The width of the downgradient boundary is calculated by adding the increased width for each side (the tangent of 5° (0.0875) times the mixing zone length) to the width of the upgradient boundary (**Figure 6**). The resulting downgradient boundary width is 902.5 feet. Standard mixing zones extend 15 feet below the top contact of the ground water table. A map of the mixing zones is provided in **Figure 7**.



**Figure 6: Mixing zone schematic**

The following describes the method used by DEQ to calculate the volume of ground water available for dilution. A hydrogeologic and mixing zone information summary is provided in **Table 7**.

Based on the mixing zone dimensions and the hydrogeologic characteristics (**Section 2**), the volume of ground water ( $Q_{gw}$ ) available for mixing is calculated using Darcy's Equation:

$$Q_{gw} = KIA$$

Where  $Q_{gw}$  = ground water flow volume (ft<sup>3</sup>/day);

K = hydraulic conductivity (ft/day);

I = hydraulic gradient (ft/ft) and;

A = cross-sectional area (ft<sup>2</sup>) of flow at the downgradient boundary of the mixing zone.

<b>Table 7. Hydrogeologic and Mixing Zone Information - MTX000210</b>		
<b>Parameter</b>	<b>Units</b>	<b>Value</b>
Mixing Zone Type	-	Standard
Authorized Parameters	-	Nitrate
Ambient Ground Water Concentrations, Nitrate + Nitrite	mg/L	1.17
Ground Water Flow Direction	azimuth/bearing	N41°E
Length of Mixing Zone	feet	500
Thickness of Mixing Zone	feet	15
Outfall Width, Perpendicular to Ground Water Flow Direction	feet	815
Width of Mixing Zone at Down Gradient Boundary	feet	902.5
Cross Sectional Area of Mixing Zone (A)	ft <sup>2</sup>	13,538
Hydraulic Conductivity (K)	feet/day	140
Hydraulic Gradient (I)	ft/ft	0.0230
Volume of Ground Water Available for Mixing ( $Q_{gw}$ )	ft <sup>3</sup> /day	43,592

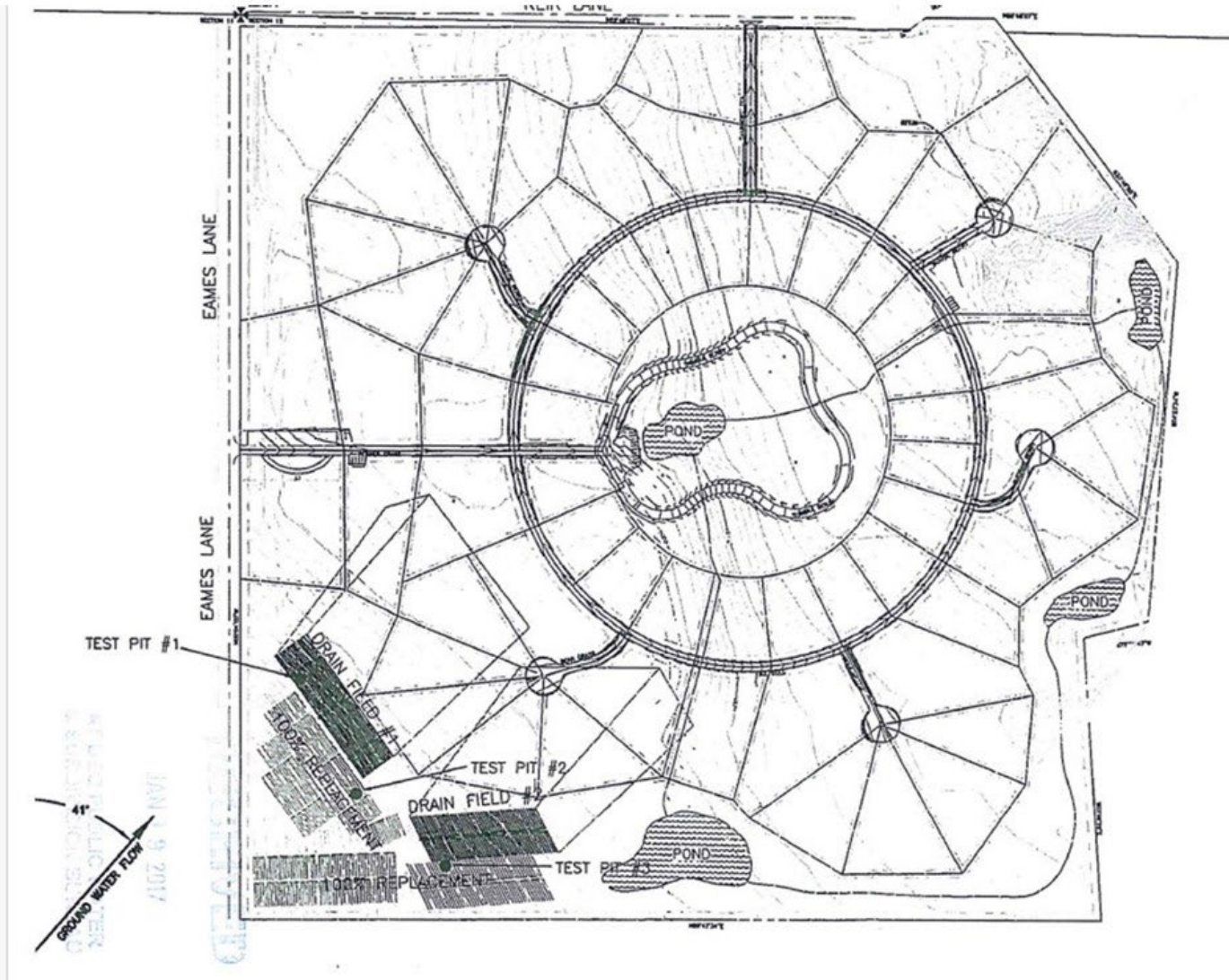


Figure 7: Drainfield and Mixing Zone Locations - Heron Creek Subdivision.

## 5.0 LIMITATIONS

Discharge permits include conditions that ensure compliance with the Montana Water Quality Act and the regulations used to implement it. These conditions include effluent limits as well as any special conditions that DEQ deems necessary to protect the quality of the receiving water.

### 5.1 NITROGEN

To protect beneficial uses, there shall be no increase of a pollutant to a level that renders the waters harmful, detrimental, or injurious. Therefore, no wastewaters may be discharged such that the wastewater either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard. DEQ will establish an effluent limitation for nitrogen within this permit. The limit is conservatively based on the assumption that the entire nitrogen load in the wastewater stream may ultimately be converted to nitrate in the receiving aquifer.

The allowable discharge will be derived from a mass-balance equation. This steady-state model evaluates the assimilative capacity of the receiving aquifer and accounts for ambient groundwater quality, wastewater discharge volume, and available dilution within the mixing zone. The mass-balance equation derived for ground water is as follows:

$$Q_{gw}C_{gw} + Q_{eff}C_{eff} = Q_{comb}C_{proj}$$

Where  $Q_{gw}$  = ground water available for mixing;

$C_{gw}$  = ambient receiving ground water concentration;

$Q_{eff}$  = design capacity of wastewater system;

$C_{eff}$  = effluent pollutant concentration;

$Q_{comb}$  = combined ground water and effluent volume, and;

$C_{proj}$  = projected pollutant concentration (after available dilution).

The mass-balance equation has been arranged to calculate the maximum amount of nitrogen that can be added to the aquifer without causing or contributing to an exceedance of the water quality standard:

$$C_{limit} = C_{std} + \frac{Q_{gw}}{Q_{eff}} (C_{std} - C_{gw})$$

Where  $C_{limit}$  = concentration-based effluent limit;

$C_{std}$  = water quality standard concentration, (7.5 mg/L);

$Q_{gw}$  = ground water available for mixing (43, 592 ft<sup>3</sup>/day);

$Q_{eff}$  = maximum design capacity of wastewater system (27,250 gpd); and

$C_{gw}$  = ambient receiving ground water concentration (1.17mg/L).

Numeric effluent limits are often expressed as loads which inherently regulates both volume and strength of the discharge. The load limit ensures compliance with the ground water standard at the end of the mixing zone.

$$L_{limit} = C_{limit}Q_{eff}f_{con}$$

Where  $L_{\text{limit}}$  = load-based effluent limit (lbs/day);  
 $C_{\text{limit}}$  = concentration-based effluent limit (mg/L);  
 $Q_{\text{eff}}$  = design capacity of wastewater system (gpd); and  
 $f_{\text{con}}$  = conversion factor of  $8.34 \times 10^{-6}$ .

With the facility's maximum design capacity of 27,250 gpd, the resulting concentration and load limits are:

$$C_{\text{limit}} = 84 \text{ mg/L}$$

$$L_{\text{limit}} = 19.2 \text{ lbs/day}$$

However, the facility is required to meet Level 2 technology-based treatment standard of 24 mg/L total nitrogen. When expressed as a load at the daily maximum design flow (27,250 gpd), the resulting technology-based limit is:

$$L_{\text{tb limit}} = (24 \text{ mg/L}) (27,250 \text{ gpd}) (8.34 \times 10^{-6})$$

$$L_{\text{tb limit}} = \mathbf{5.45 \text{ lbs/day}}$$

Because the technology-based limit is more restrictive than the water quality-based load, DEQ is required to apply the most restrictive applicable effluent limitation. Therefore, the total nitrogen effluent limitation established in this permit is 5.45 lbs/day.

DEQ evaluates and recalculates the limits using updated water quality data as part of every permit renewal cycle. In this way, DEQ protects the receiving water quality by continually assessing impacts to the receiving water.

## 5.2 PHOSPHORUS

Previous permits evaluated phosphorus transport from the drainfield to the nearest downgradient surface water (Spokane Creek). The analysis assumed both drainfield function as a single source do their proximity and similar orientation and estimated a phosphorus breakthrough time of approximately of 82.4 years. Because this exceeds the 50-year significance threshold in ARM 17.30.715(1)(e), the discharge was determined to result in a nonsignificant change in water quality.

The current permit renewal does not increase discharge volume or change the disposal configuration; therefore, the previous phosphorus breakthrough analysis remains applicable and a numeric effluent limitation for total phosphorus is not included in this permit.

## 5.3 FINAL EFFLUENT LIMITS

The effluent limitations for this permit are summarized in **Table 8**.

Parameter	Units	Monthly Average <sup>(1)</sup>
Total Nitrogen (as N)	lbs/day	5.45
Footnotes:		

(1) Daily Maximum Load: The daily maximum load shall be calculated using the highest measured daily concentration and corresponding daily flow from the same day. Calculation procedures are provided in the Wastewater Monitoring Tables.

## 6.0 MONITORING AND REPORTING

Long-term monitoring and reporting of wastewater and ground water will be established as a condition of the permit. Monitoring of the wastewater characteristics before and after treatment will help ensure operation, maintenance, and compliance with the permit limitations. Wastewater monitoring and reporting requirements are provided in **Table 9**.

Ground water monitoring will provide DEQ with ongoing information on the current and future health of the aquifer. Ground water monitoring and reporting requirements are provided in **Table 10**. The permittee must develop and implement a Ground Water Monitoring, Analysis, and Reporting Operational Manual. This manual is further discussed in **Section 7**.

Reporting must be completed in use of Discharge Monitoring Reports (DMRs). The permittee or operator will file DMRs electronically through the online NetDMR program. Information and contacts for this program can be found here: <https://deq.mt.gov/water/assistance>.

Analyte/Measurement	Monitor Location	Units	Sample Type <sup>(1)(2)</sup>	Minimum Sample Frequency	Reporting Requirements <sup>(1)(3)</sup>	Report Frequency
Flow Rate, Effluent <sup>(4)(5)</sup>	FM-001	gal/d	Continuous	Continuous	Daily Max and Quarterly Average	Quarterly
Biochemical Oxygen Demand (BOD <sub>5</sub> )	EFF-001	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly
Nitrogen, Nitrite+Nitrate [as N]	EFF-001	mg/L	Grab	1/Quarter	Daily Max and Quarterly Average	Quarterly
Nitrogen, Total Ammonia [as N]	EFF-001	mg/L	Grab	1/Quarter	Daily Max and Quarterly Average	Quarterly
Nitrogen, Total Kjeldahl (TKN)[as N]	EFF-001	mg/L	Grab	1/Quarter	Daily Max and Quarterly Average	Quarterly
Nitrogen, Total [as N] <sup>(5)(6)</sup>	EFF-001	mg/L	Calculate	1/Quarter	Daily Max and Quarterly Average	Quarterly

Nitrogen, Total [as N] <sup>(5)(6)</sup>	EFF-001	lbs/day <sup>(7)</sup>	Calculate	1/Quarter	Daily Max and Quarterly Average	Quarterly
Total Suspended Solids (TSS)	EFF-001	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly

## Footnotes:

EFF-001: Description provided in Table 1 of the Fact Sheet document.

FM-001: Description provided in Table 1 of the Fact Sheet document.

Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136, unless specified above or within a deviation authorized by DEQ.

(1) See definitions in Part V of the permit unless defined within this table or by a permit condition.

(2) Grab sample will represent concentrations for a 24-hour period.

(3) Daily Maximum: Report highest measured daily value for the reporting period on DMR form.

(4) If no discharge occurs during the reporting period, "No Discharge" shall be recorded on the DMR form.

(5) Requires recording device and/or totalizing meter. Equipment must be capable of recording daily, quarterly, and annual effluent volumes.

(6) Total Nitrogen is the sum of Nitrate + Nitrite and Total Kjeldahl Nitrogen.

(7) Daily Maximum Load Calculation: lbs/day = (maximum daily concentration, mg/L) × (maximum daily flow, gal/day) × 8.34 × 10<sup>-6</sup>. The daily maximum concentration and corresponding daily flow shall be from the same day and represent the highest measured values during the reporting period.

**Table 10: Monthly Ground Water Monitoring and Reporting Requirements - MTX000210**

Analyte/Measurement	Monitor Location	Units	Sample Type <sup>(1)</sup>	Minimum Sample Frequency	Reporting Requirements <sup>(1)(2)</sup>	Report Frequency
Chloride [as Cl]	MW-02 MW-03	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly
Nitrogen, Nitrite+Nitrate [as N]	MW-02 MW-03	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly
Nitrogen, Total Ammonia [as N]	MW-02 MW-03	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly
Nitrogen, Total Kjeldahl (TKN)[as N]	MW-02 MW-03	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly
Nitrogen, Total [as N] <sup>(3)</sup>	MW-02 MW-03	mg/L	Calculate	1/Quarter	Quarterly Average	Quarterly
Specific Conductivity @ 25°C	MW-02 MW-03	µS/cm	Grab or Instantaneous	1/Quarter	Quarterly Average	Quarterly

Temperature	MW-02 MW-03	°C	Instantaneous	1/Quarter	Quarterly Average	Quarterly
Static Water Level (SWL) <sup>(4)</sup>	MW-02 MW-03	ft- bmp	Instantaneous	1/Quarter	Quarterly Average	Quarterly
Well Depth <sup>(4)</sup>	MW-02 MW-03	ft- bmp	Instantaneous	1/Quarter	Quarterly Average	Quarterly

**Footnotes:**

CFU = Colony Forming Units

ft-bmp = feet below measuring point

A description of each monitoring well can be found in Table 3 of the Fact Sheet document.

At no time shall the permittee mark or state “no discharge” on any monitoring well DMR form.

Each well to be individually monitored and sampled for the analyte and measurements respectively listed.

If any monitoring well(s) are abandoned, destroyed or decommissioned, or are no longer able to be sampled due to fluctuations in the ground water table; the permittee shall install a new well to replace the abandoned, destroyed, decommissioned, or non-viable well(s).

Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136, unless specified above.

Samples must not be collected until after the well casing is properly purged as determined by the DEQ approved Ground Water Monitoring Operational Manual.

Submittal of discharge monitoring report forms (DMRs) will be required, regardless of the operational status of the facility or of each individual monitoring well.

(1) See definitions in Part V of the permit unless defined within this table or by a permit condition.

(2) Average: The average of all individual daily concentrations (mg/L) analyzed during the monthly reporting period.

(3) Total Nitrogen is the sum of Nitrate + Nitrite and Total Kjeldahl Nitrogen.

(4) Measuring point (point of reference) for SWL measurements shall be from top of inner casing or as established by the Operational Manual and measured to within 1/100th of one foot.

## 7.0 SPECIAL CONDITIONS

### 7.1 MONITORING WELL INSTALLATION PLAN

The permittee shall submit, for Department approval, an installation plan for two downgradient compliance monitoring wells, one for Outfall 001a and one for Outfall 001b. Each well shall be located near the downgradient boundary of the mixing zone for the respective drainfields and positioned generally along the centerline of ground water flow. Minor adjustments to well placement due to site constraints may be proposed within the installation plan.

Each well must be constructed to be representative of ground water occurring in the top twenty (20) feet of the shallow aquifer or as otherwise approved by the Department.

The plan must be approved prior to installation of the monitoring wells. All monitoring wells must be secured, maintained, labeled, and monitored for long-term viability. The completion and submittal date of the plan is listed in **Section 8**.

The installation dates for Monitoring Well MW-02 and MW-03 are provided in **Section 8**. A post construction report documenting lithology, drilling and construction techniques, well construction information and diagram, surveyed spatial location and measuring point is due two months after installation. All new wells must be reported to the Montana Bureau of Mining and Geology's Ground Water Information Center (GWIC).

Installation and post construction reports are required for all subsequent well installation and modification actions.

DEQ recognizes the challenges faced with well installation in field conditions. Upon approval, modification to the plan can be made when site conditions require adjustment.

## **7.2 GROUND WATER MONITORING, ANALYSIS, AND REPORTING OPERATIONAL MANUAL**

The permittee shall use Best Management Practices (BMPs) in developing SOPs (Standard Operating Procedures) for sampling, analyzing, and reporting ground water characteristics. The SOP manual must be site-specific and result in monitoring and reporting that is representative of the nature of the shallow ground water bearing zone. The manual must establish consistent identification, development, monitoring, sampling, calculating, recording, and reporting of the monitoring wells. The manual must provide for guidance on determining and documenting dry-well occurrences; and determining future well viability. DEQ recommends using the Montana Bureau of Mines and Geology Open-File Report 746 titled Standard Procedures and Guidelines for Field Activities (MBMG, 2022) as a reference in developing a site-specific operational manual.

The completion and submittal date of the manual is listed in **Section 8**. The manual must be reviewed and approved by DEQ prior to implementation. The permittee shall maintain a copy of the manual, monitoring well development records, dry well occurrence records, sampling records, and calibration records at the facility at all times. Ground water monitoring requirements are discussed in **Section 6**. All subsequent amended manuals must be reported to DEQ within 30 calendar days.

## **7.3 MONITORING WELL VIABILITY**

The permittee shall monitor and collect representative ground water samples from the receiving ground water aquifer. If any of the wells are abandoned, destroyed, decommissioned, or non-viable; or are no longer able to be monitored due to obstructions or fluctuations in the ground water table; the permittee shall rehabilitate the non-viable well or replace with the installation of a new well.

## 7.4 MONITORING WELL REPLACEMENT, REHABILITATION, AND ABANDONMENT

If for any reason a monitoring well needs to be replaced, rehabilitated, or abandoned, the permittee shall submit a plan to DEQ for approval prior to the action taking place. The plan must document existing site-specifics and the reasoning behind the proposed action. The plan must detail the specific steps to take place during deconstruction, drilling, workover, and/or construction of the respective wells.

Written permission from DEQ is needed prior to the abandonment of any monitoring well. At minimum, monitoring well abandonment activities must be done in accordance with ARM 36.21.810(2-5). If the monitoring well is located in or around any collection, storage, treatment, disposal, land application, and/or mixing zone workings (or similar) additional actions may be required to prevent preferential subsurface flows, cross contamination, and to mitigate against any unauthorized wastewater releases. All new well installations must have detailed drilling, lithology, geospatial, and well construction information. A follow-up report summarizing all actions and details must be submitted to DEQ within 30 calendar days.

## 8.0 COMPLIANCE SCHEDULE

The actions listed in **Table 11** must be completed on or before the respective scheduled completion date. A report documenting each respective action must be received by DEQ on or before the scheduled reporting date. Unless otherwise stated, completion of all actions or deliverables must be reported to DEQ in accordance with Part II and Part IV.G of the permit.

<b>Table 11: Compliance Schedule - MTX000210</b>			
<b>Action</b>	<b>Frequency</b>	<b>Completion Date of Action</b>	<b>Reporting Due Date</b>
Develop and implement a Ground Water Monitoring, Analysis, and Reporting Operational Manual.	Single event	<i>Within 90 days of the effective date of the permit.</i>	Due on or before the 28th day of the month following the completion date.
Complete a Monitoring Well Installation Plan.	Single event	<i>Within 180 days of the effective date of the permit.</i>	Due on or before the 28th day of the month following the completion date.
Complete the installation of the monitoring well(s).	Single event	<i>Within one (1) year of the effective date of the permit.</i>	Due on or before the 28th day of the month following the completion date.
Commence monitoring and reporting of the newly installed monitoring well(s).	Single event	<i>Within one (1) year of the effective date of the permit.</i>	Due on or before the 28th day of the month following the completion date.

Complete a Monitoring Well Installation Report.	Single event	<i>Within one (1) year and two (2) months of the effective date of the permit.</i>	Due on or before the 28th day of the month following the completion date.
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## 9.0 PUBLIC NOTICE

Legal notice information for water quality discharge permits are listed at the following website: <http://deq.mt.gov/Public/notices/wqnotices>. Public comments on this proposal are invited any time prior to close of business on **June 11, 2026**. Comments may be directed to [DEQWPBPublicComments@mt.gov](mailto:DEQWPBPublicComments@mt.gov) or to

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

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments pertinent to this permitting action and may issue a final decision within thirty days of the close of the public comment period.

All persons, including the applicant, who believe any condition of the draft permit is inappropriate, or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing). All public comments received for this draft permit will be included in the administrative record and will be available for public viewing during normal business hours.

Copies of the public notice are mailed to the applicant, state and federal agencies, and interested persons who have expressed interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this draft permit. Electronic copies of the public notice, draft permit, fact sheet, and draft environmental assessment are available at the following website: <http://deq.mt.gov/Public/notices/wqnotices>.

Any person interested in being placed on the mailing list for information regarding this permit may contact the DEQ Water Protection Bureau at (406) 444-5546 or email [DEQWPBPublicComments@mt.gov](mailto:DEQWPBPublicComments@mt.gov). All inquiries will need to reference the permit number (MTX000210), and include the following information: name, address, and phone number.

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing.

## 10.0 REFERENCES

40 CFR § 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants. 2017.

Administrative Rules of Montana, Title 17, Chapter 30, Water Quality:

Subchapter 2 - Water Quality Permit Fees.

Subchapter 5 - Mixing Zones in Surface and Ground Water.

Subchapter 7 - Nondegradation of Water Quality.

Subchapter 10 - Montana Ground Water Pollution Control System.

Subchapter 13 - Montana Pollutant Discharge Elimination System.

Department of Environmental Quality. 2008. Administrative Record of Montana Ground Water Pollution Control System (MGWPCS) permit application and supplemental materials, Heron Creek Subdivision, MTX000210.

Department of Environmental Quality. 2014. Administrative Record of Montana Ground Water Pollution Control System (MGWPCS) permit application and supplemental materials, Heron Creek Subdivision, MTX000210.

Department of Environmental Quality, Water Quality Circulars:

Circular DEQ-2 – Design Standards for Wastewater Facilities.

Circular DEQ-4 – Montana Standards for On-Site Subsurface Sewage Treatment Systems.

Circular DEQ-7 – Montana Numeric Water Quality Standards, Required Reporting Values, and Trigger Values.

Heron Creek Subdivision. 2019. MGWPCS MTX000210 Permit Application. May 02, 2019.

Montana Bureau of Mines and Geology, Ground-Water Information Center, GWIC state well database, Online at: <http://mbmaggwic.mtech.edu>.

Montana Bureau of Mines and Geology, 2021. Standard Procedures and Guidelines for Field Activities, Open-File Report 746, p.96. Online at: <http://www.mbm.mtech.edu/mbmgcat/catmain.asp>

Montana Code Annotated, Title 75, Chapter 5, *Montana Water Quality Act*, 2011.

