



Water Quality Division
Montana Pollutant Discharge Elimination System (MPDES) ▪ Fact Sheet

Permittee:	City of Chinook
Permit No.:	MT0020125
Receiving Water:	Milk River
Outfall Location:	48.579444° N, 109.214444° W
Facility Information	
Name:	Chinook Wastewater Treatment Plant
Location:	48.579694° N, 109.214167° W 300 Daffy Hills Lane Chinook, MT 59523
Contact:	Eric Miller, Supervisor
Fee Information	
Type of Facility:	Minor Publicly Owned Treatment Works
Number of Outfalls:	1 (For Fee Determination Only)
Type of Outfall:	001 – Facility Discharge
Fact Sheet Date:	October 2020

I. Summary

Department of Environmental Quality (DEQ) proposes to renew the Montana Pollutant Discharge Elimination System (MPDES) permit for city of Chinook Wastewater Treatment Plant (WWTP), MT0020125. This fact sheet documents the legal requirements and technical rationale that serve the decision-making process involved with developing effluent limits, monitoring and reporting requirements, and special conditions which are specific to Chinook. The proposed permit renewal has the following changes to effluent limits and monitoring requirements:

- The nitrate plus nitrite and ammonia effluent limits will be removed.
- Oil and grease monitoring has changed from quarterly to semi-annual.
- Ambient/upstream quarterly monitoring will be required for ammonia, nitrate plus nitrite, pH, and temperature.
- Monitoring will not be required for acute whole effluent toxicity (WET), total recoverable metals, phenols, cyanide, volatile organic compounds, semi-volatile acid-extractable compounds, and semi-volatile base neutral compounds.

II. Facility Information

A. Permit Status

- September 1, 2012 2012-issued permit became effective.
- September 2, 2016 MPDES received renewal permit application.
- *September 29, 2016* *2012-issued permit was administratively extended.*
- August 31, 2017 Expiration date for the 2012-issued permit.

B. Facility Description and Design Criteria Summary

The Chinook WWTP serves the City of Chinook with a current population of approximately 1,200 people. The WWTP is an oxidation ditch activated sludge facility with a design flow of 0.50 million gallons per day (mgd), constructed in 1984 and last upgraded in 2005. The facility has made operation adjustments since the 2012-issued permit to optimize nutrient removal. Discharge from the WWTP is continuous to the Milk River at approximately 48.579444 latitude, -109.214444 longitude.

The Chinook WWTP includes the following components:

- Pretreatment: screw pumps, and two parallel flow channels each containing a mechanically-cleaned bar screen and grit chamber
- Biological Treatment: oxidation ditch (equipped with slow mixers in 2005)
- Two secondary clarifiers (one covered for winter operation and the other open for warm weather operation)
- Effluent disinfection: ultraviolet light (UV) treatment with discharge to the Milk River
- Solids: sludge pumps, aerobic digester, vacuum drying bed
- Emergency power generation equipment.

C. Existing Permit Requirements

Table 1. 2012-Issued Permit Limits				
Parameter	Units	Average Monthly Limit ⁽¹⁾	Average Weekly Limit ⁽¹⁾	Maximum Daily Limit ⁽¹⁾
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	-
	lb/day	125	188	-
	% Removal	85%	-	-
Total Suspended Solids (TSS)	mg/L	30	45	-
	lb/day	125	188	-
	% Removal	85%	-	-
pH	s.u.	Within the range of 6.0 and 9.0		
<i>E. Coli</i> Bacteria, Summer ⁽²⁾	cfu/100ml	126	252	-
<i>E. Coli</i> Bacteria, Winter ⁽²⁾	cfu/100ml	630	1260	-
Oil and Grease	mg/l	-	-	10
Total Ammonia, as N	mg/L	2.3	-	4.6
Nitrate plus Nitrite, as N	mg/L	-	-	30.2
Total Nitrogen, as N ^(3,4)	lb/day	31.1	-	-
Total Phosphorus, as P ⁽⁴⁾	lb/day	5.7	-	-
(1) See Definitions section at the end of the MPDES permit for explanation of terms				
(2) <i>Escherichia coli</i> bacteria - summer is April 1 through October 31, winter is November 1 through March 31				
(3) Calculated as the sum of nitrate + nitrite and total Kjeldahl nitrogen concentrations				
(4) Seasonal limit applies June 1 – September 30				

D. Effluent Characteristics

Because treatment has remained consistent for the past five years, effluent data from July 2015 to July 2020 were selected to represent the period of record (POR), and are representative of the facility's effluent quality. Table 2 summarizes effluent quality as reported on discharge monitoring reports. Table 3 summarizes the effluent quality concerning toxic pollutants that were monitored twice in 2015.

Table 2. Effluent Characteristics July 2015 to July 2020 ⁽¹⁾					
Parameter	Units	Minimum Value	Maximum Value	Average Value	Sample Size
Temperature	°C	3.1	23.4	13.1	61
Flow Rate	mgd	0.03 ⁽²⁾	0.99	0.07	61
Conventional Pollutants:					
Biochemical Oxygen Demand (BOD ₅)	mg/L	2.1 ⁽²⁾	13.6 ⁽²⁾	5.4	61
	lb/day	1.16 ⁽²⁾	17 ⁽²⁾	2.9	61
	% Removal	95.4 ⁽³⁾	98.9 ⁽³⁾	97.7 ⁽³⁾	61
	mg/L	1.86 ⁽²⁾	10.8 ⁽²⁾	4.7	61

Total Suspended Solids (TSS)	lb/day	0.76 ⁽²⁾	8.6 ⁽²⁾	2.7	61
	% Removal	94.9 ⁽³⁾	99.2 ⁽³⁾	97.5 ⁽³⁾	61
pH	s.u.	6.48	7.83	7.16	61
<i>E.Coli</i> Bacteria, Summer	cfu/100ml	0	225	5.24	36
<i>E.Coli</i> Bacteria, Winter	cfu/100ml	0	187	8.07	25
Oil and Grease	mg/l	0	0	0	15
<i>Nonconventional Pollutants:</i>					
Total Ammonia, as N	mg/L	0.04 ⁽²⁾	4.30	0.31	61
Nitrate plus Nitrite, as N	mg/L	0.44	9.26	1.22	61
Kjeldahl Nitrogen, as N	mg/L	0.90	7.40	1.72	61
Total Nitrogen, as N	mg/L	1.60	11.30	2.94	61
	lb/day	0.50	6.50	1.60	61
Total Phosphorus, as P	mg/L	0.27	3.62	1.58	61
	lb/day	0.08	2.79	0.82	61
Acute Whole Effluent Toxicity (WET)	Pass/Fail	Passed All			10
(1) Except for WET testing, which occurred 2012-2014					
(2) Based off reported monthly average.					
(3) Based off reported monthly minimum					

E. Compliance History

The facility had one compliance evaluation inspection for the POR in September of 2015. During the 2015 inspection, no violations were noted. Non-reporting and exceedance violations for the POR were limited.

III. Receiving Waters

Chinook’s wastewater treatment plant discharges to the Milk River. This section of the Milk River has been identified as impaired for mercury, but does not have a total maximum daily load (TMDL).

A. Receiving Water Summary

The following information is used to develop water quality based effluent limits:

- Water Use Classification: B-3
- Watershed: Milk
- Waterbody Name/Location: Milk River, Fresno Dam to Thirtymile Creek
- Montana Stream Segment: MT40J001_011
- USGS Hydrologic Unit Code: 10050004
- USGS Stream Gage: Milk River near Havre, 06140500
- Ecoregion: Northwestern Glaciated Plains
- Identified as Impaired: 2018 303(d) List
- Total Maximum Daily Load (TMDL): None
- Salmonids and early life stages: Present
- 7Q10: 9.97 mgd (15.42 cfs)
- Dilution Ratio (7Q10: facility mean annual flow): 152:1

B. Water Use Classification

According to Montana Water Use Classifications, this section of the Milk River is classified as B-3. The goal of the state of Montana is to maintain B-3 class waters suitable for:

- drinking, culinary, and food processing purposes, after conventional treatment;
- bathing, swimming, and recreation;
- growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers;
- and agricultural and industrial water supply.

C. Impairments

The 2018 303(d) list shows this segment of the Milk River as *not* fully supporting drinking water use. It is fully supporting agricultural use, and is not assessed for aquatic life or primary contact recreation.

Pollutants identified as causing impairments:

- Mercury

Probable Sources of impairments:

- Agriculture
- Dam or Impoundment
- Natural Sources

D. Applicable Water Quality Standards

Each waterbody classification has numeric and narrative water quality standards designed to ensure that beneficial uses are protected.

E. Ambient Stream Conditions

1. Instream Pollutant Concentrations

Recent ambient (instream/upstream) water quality data for the Milk River upstream of Chinook WWTP is available from one sampling event in 2005 and two sampling events in 2010. All three events occurred at the same site by MT DEQ. Table 4 shows the upstream water quality parameters necessary for calculations.

Table 3. Milk River Relevant Upstream Water Quality and Comparison to Water Quality Standards					
<u>Receiving Water Quality</u>			<u>Water Quality Standards ⁽¹⁾</u>		
Parameter	Sample Size	75 th Percentile	Acute	Chronic	Human Health
Total Ammonia (mg/L)	2	0.05 ⁽²⁾	2.33	0.77	-
Hardness, as CaCO ₃ (mg/L)	3	159 ⁽³⁾	No Standard		
pH (s.u.)	3	8.455	6.0 – 9.0		
Temperature (°C)	3	21.2	Varies for B-3 Waters		

(1) From Circular DEQ-7
 (2) No detection reported on all samples, reporting level (RL) represents the 75th percentile
 (3) 25th percentile

2. Low Flow

In the 2012 Fact Sheet, the 7-day, 10-year average low flow (7Q10) for the receiving water was calculated from USGS gaging station (06136700) on the Milk River below Fresno Dam, approximately 62 miles upstream of Chinook WWTP discharge point. The USGS gage has

not been active since 1952, making this an insufficient method for determining an updated 7Q10 value.

DEQ will use the 7Q10 calculated by using flow data from the USGS gaging station 06140500 for the Milk River near Havre in the reasonable potential analysis. This station is closer to Chinook WWTP, has a long-term data set (1955-2017), and is void of any additions or withdrawals. One small creek lies between USGS gage station 06140500 and Chinook WWTP, but its flows were considered insignificant.

- 7-day, 10-year average low flow (7Q10) = 15.42 cfs = 9.97 mgd

IV. Technology-Based Effluent Limits (TBELs)

Technology-based effluent limitations (TBELs) represent the minimum treatment requirements implemented in MPDES permits. The limits are based on actual, available control technologies to treat pollutants, and must be met prior to dilution. The Montana Board of Environmental Review has adopted by reference 40 CFR 133, which defines minimum requirements for secondary treatment for publicly owned treatment works.

A. Applicable Effluent Limits

1. National Secondary Treatment Standards (NSS)

40 CFR 133 defines minimum treatment requirements for secondary treatment or equivalent for POTWs as measured by pH, BOD₅, TSS, and percent removal of BOD₅ and TSS. Chinook WWTP is currently being held to National Secondary Standards for all three parameters.

The TBELs from the 2012-issued permit will be retained:

- BOD₅ and TSS monthly average: shall not exceed 30 mg/L
- BOD₅ and TSS weekly average: shall not exceed 45 mg/L
- BOD₅ and TSS monthly average % removal: shall not be less than 85%.
- pH: must be within the range of 6.0 to 9.0.

2. Mass-Based Expression of Limits

Effluent limits must be expressed in terms of mass and are identified as load (pounds/day) when suitable. Exceptions include parameters that cannot be appropriately expressed in mass, such as pH and temperature. The following equations were used to calculate the BOD₅ and TSS mass-based load allocations using the TBEL concentrations associated with national secondary treatment standards, the design flow of 0.50 mgd, and a conversion factor:

$$BOD_5 \text{ and TSS monthly average load} = 0.50 \text{ mgd} \times 30 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 125.1 \frac{\text{lb}}{\text{day}}$$

$$BOD_5 \text{ and TSS weekly average load} = 0.50 \text{ mgd} \times 45 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 187.7 \frac{\text{lb}}{\text{day}}$$

Load limits for BOD₅ and TSS will apply to the effluent and the monthly average load limit will be maintained at the more stringent of the nondegradation load allocations or mass-based loading limits, as discussed next.

B. Nondegradation

Montana's nondegradation policy prevents degradation of state waters and ensures that existing uses continue to be achieved. Nondegradation allocated loads for Chinook WWTP

were determined for TN and TP in the 2012-issued permit, and were initially documented in a Statement of Basis dated November 15, 1994. These allocated loads are shown in Table 4. The monthly average for both TP and TN from September 2012 to June 2020 did not exceed the nondegradation allocated loads. Sources that comply with the conditions of their permit and do not exceed the limits are not considered new or increased sources.

The previous total nitrogen and total phosphorus nondegradation allocated loads were calculated in 1994 using the Department of Health and Environmental Sciences (DHES) policy in effect at that time.

Table 4. Nondegradation Allocated Loads from 2012-Issued Permit						
Previous Nondegradation Allocated Limits		Average Monthly Load (lb/d)				
Parameter	Load (lb/d)	2015	2016	2017	2018	2019
Total Nitrogen as N	138	2.63	2.75	1.39	0.91	1.49
Total Phosphorus as P	35	1.33	1.07	0.82	0.54	0.75

The BOD₅ and TSS mass-based load allocations described in the previous section will serve as nondegradation limits moving forward.

Table 5. Nondegradation Allocated Loads Issued in this Permit						
Nondegradation Allocated Limits		Average Monthly Load (lb/d)				
Parameter	Load (lb/d)	2015	2016	2017	2018	2019
BOD ₅	125.1	3.10	4.84	2.06	2.78	2.50
TSS	125.1	3.95	4.90	1.70	2.15	2.38

C. Final Technology-Based Effluent Limits

Table 6. Technology-Based Effluent Limits for Outfall 001			
Parameter	Units	Average Monthly Limit	Average Weekly Limit
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45
	lb/day	125	188
	% Removal	85%	-
Total Suspended Solids (TSS)	mg/L	30	45
	lb/day	125	188
	% Removal	85%	-
pH	s.u.	Within the range of 6.0 and 9.0	

V. Water Quality-Based Effluent Limits (WQBELs)

Permits are required to include Water Quality-Based Effluent Limits when TBELs are not adequate to protect state water quality standards. WQBELs are developed for each parameter demonstrating reasonable potential to cause or contribute to an excursion from any water quality standard.

A. Scope and Authority

The Montana Water Quality Act states that a permit may only be issued if DEQ finds that it will not result in pollution of any state waters. No wastes may be discharged that can reasonably be expected to violate any state water quality standards. Montana water quality standards define both water use classifications for all state waters, and numeric and narrative standards that protect those designated uses. MPDES permit limitations must control all pollutants which will cause or have reasonable potential (RP) to cause or contribute to an excursion above any state water quality standard, including narrative criteria.

B. Applicable Water Quality Standards

The discharge from Chinook WWTP must comply with general prohibitions (narrative standards) which require that state waters, including mixing zones, must be free from substances which will:

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

C. Pollutants of Concern

Pollutants and parameters are identified as a pollutant of concern for the following reasons:

- Listed as TBELs
- Identified as needing WQBELs in the previously issued permit
- Associated with impairment which may or may not have a wasteload allocation (WLA) in a total maximum daily load (TMDL).

The need for additional WQBELs is based on reasonable potential for pollutants to exceed numeric or narrative water quality standards. Pollutants specific to Chinook WWTP include those found in Table 7. Identification of a pollutant of concern (POC) is not an indication that WQBELs are necessary, but an indication that further evaluation is required.

Table 7. Identification of Pollutants of Concern for WQBELs	
Parameter	Basis for POC Identification
<i>Conventional Pollutants:</i>	
BOD ₅	TBEL in Previous Permit
TSS	TBEL in Previous Permit
pH	TBEL in Previous Permit
<i>Escherichia coli (E. coli)</i>	WQBEL in Previous Permit
Oil and Grease	WQBEL in Previous Permit
<i>Nonconventional Pollutants:</i>	
Total Nitrogen, as N	WQBEL in Previous Permit
Total Ammonia, as N	WQBEL in Previous Permit
Nitrate + Nitrite, as N	WQBEL in Previous Permit

Total Nitrogen, as N	WQBEL in Previous Permit
Total Phosphorus, as P	WQBEL in Previous Permit

D. Mixing Zone

A mixing zone is an area where the effluent mixes with the receiving water and certain water quality standards may be exceeded. Mixing zones must have the smallest practicable size, a minimum practicable effect on water uses, and definable boundaries. DEQ sets the available dilution flow on a parameter-by-parameter basis to assess RP and to achieve acute, chronic, and human health standards.

- Acute water quality standards for aquatic life may not be exceeded in any portion of the mixing zone unless the Department finds that allowing minimal initial dilution will not threaten or impair existing uses.
- An effluent in its mixing zone may not block passage of aquatic organisms nor may it cause acutely toxic conditions.
- No mixing zone will be granted that will impair beneficial uses.
- Aquatic life-chronic, aquatic life-acute and human health standards may not be exceeded outside of a designated mixing zone.
- DEQ may require information from the permittee before determining appropriate mixing and the conditions which should be applied.

The following mixing zone was allowed in the 2012-permit and will be retained:

Standard Mixing Zone - The mean average flow from Chinook WWTP is less than one mgd and the dilution ratio with the Milk River is greater than 100:1 (9.97 mgd 7Q10 stream flow/ 0.07 mgd effluent mean annual flow). Therefore, a standard mixing zone is granted for necessary parameters. Dilution for acute conditions is given based on DEQ finding minimal initial dilution will not threaten or impair existing beneficial uses. Discharge limits will apply year-round at end-of-pipe. When determining reasonable potential for these parameters, DEQ will use:

- 100% of the 7Q10 flow (9.97 mgd) for chronic conditions.
- 10% of the 7Q10 flow (0.997 mgd) for acute conditions

In accordance with standard mixing zone procedures, the length of a standard mixing zone must not extend downstream more than one-half the mixing width distance or ten times the stream width, whichever is more restrictive. DEQ defined a standard mixing zone for Chinook WWTP in the 2006-permit as 10 times the stream width, which in the case of the Milk River is 800 feet downstream from the point of discharge for chronic aquatic life standards.

E. Reasonable Potential Analysis

The RP analysis predicts the impact of the discharge on the receiving water under design conditions. WQBELs are developed for each parameter that demonstrates RP to cause an exceedance of a water quality standard. DEQ uses a mass-balance equation (shown below) and a statistical approach outlined in Chapter 3 of EPA's *Technical Support Document for Water Quality-based Toxics Control* (EPA's TSD Manual) to determine RP for individual pollutants.

1. **Critical Effluent Concentration (C_d) Calculation:** The facility's maximum reported effluent concentration (C_{max}) is converted into the projected critical effluent concentration (C_d). This accounts for variation in effluent concentration.
 - First, the statistical TSD 3-2 multiplier is determined by the data set, coefficient of variation (CV) and sample size at the 95th percentile confidence interval. A default CV of 0.6 is used if there are less than 10 samples.
 - Then the TSD 3-2 multiplier is applied to the facility's maximum reported effluent concentration (C_{max}) to determine the critical effluent concentration (C_d).
2. **Parameters Not Allowed Dilution:** If the $C_d > WQS$, reasonable potential exists.
3. **Parameters Allowed Dilution:** The steady-state mass balance model (**Equation 1**) is used to determine the projected receiving water concentration (C_r). If $C_r > WQS$, reasonable potential exists.

Equation 1. Using the Mass Balance Equation to Determine Reasonable Potential

$$\text{Mass Balance Equation: } Q_s C_s + Q_d C_d = Q_r C_r$$

$$\text{Receiving Water Pollutant Concentration: } C_r = \frac{Q_d C_d + Q_s C_s}{(Q_r)}$$

Variable:

Q_s = upstream flow
 Q_d = discharge flow
 Q_r = receiving flow after discharge
 C_s = upstream pollutant conc.
 C_d = discharge pollutant conc.

Calculated As:

Q_s = dilution flow from **Part V.D**
 Q_d = average daily design flow
 $Q_r = Q_s + Q_d$
 C_s = 75th percentile critical instream conc.
 C_d = max effluent concentration · TSD multiplier

F. Water Quality-Based Limits Development

DEQ uses the approach outlined in Chapter 5 of EPA's TSD Manual to develop WQBELs for each pollutant. WQBELs are expressed as maximum daily limit (MDL) and average monthly limit (AML).

- The maximum daily limit (MDL) is the highest allowable discharge measured during a calendar day or 24-hour period representing a calendar day.
- The average monthly limit (AML) is the highest allowable value for the average of daily discharges over a calendar month.

Each parameter's MDL and AML is derived from a wasteload allocation (WLA). The WLA is the concentration of a pollutant that the point source can discharge while conforming to DEQ implementation policies and assuring applicable water quality standards are attained in the receiving water.

WQBEL development is detailed on a parameter-by-parameter basis in Section VI. Final Pollutant Evaluation.

VI. Final Pollutant Evaluation

A. Conventional Pollutants

1. **BOD₅, TSS, and pH:** These parameters are typical effluent quality indicators for wastewater treatment facilities and are regulated as TBELs. The facility provides a significant reduction in biological material and solids through secondary treatment.
 - No additional limits are necessary - TBELs adequately control these pollutants and protect the beneficial uses of the Milk River.
2. ***Escherichia coli* (*E. coli*) Bacteria:** Pathogens are known municipal wastewater contaminants. *E. coli* standards protect beneficial uses of receiving waters for pathogens. State waters must be free from substances that are harmful or toxic to humans. The standards for B-3 classified waters as expressed by most probable number, a statistical representation of the number of organisms in a sample, are:

Summer: April 1 through October 31 of each year

 - The geometric mean number must not exceed 126 organisms per 100 milliliters (org/100 mL)
 - 10% of the total samples may not exceed 252 org/100 mL during any 30-day period

Winter: November 1 through March 31 of each year

 - The geometric mean number of *E. coli* must not exceed 630 org/100 mL
 - 10% of the total samples may not exceed 1,260 org/100 mL during any 30-day period

The existing permit limits and monitoring requirements for *E. coli* are maintained in this renewal.

3. **Oil and Grease (O&G):** The 2012-permit required quarterly monitoring for this parameter. No O&G was detected during the monitoring period. If visual monitoring indicates the presence of oil and grease, an additional grab sample must be submitted for analysis and discharge must cease if the concentration is found to be greater than the standard of 10 mg/L.
 - This limit will be retained in the proposed permit.
 - Monitoring must be conducted semiannually.

B. Nonconventional Pollutants

1. **Total Ammonia:** The numeric water quality standards for ammonia account for a combination of receiving water characteristics such as the presence/absence of salmonids and early life stages of fish and the 75th percentile of pH and temperature. Ambient Milk River water quality data was available as described in Part III.E.

Table 8 demonstrates that the calculated ammonia projected receiving water concentration (C_r) with allowed dilution is below the applicable water quality standards. There is no reasonable potential for the discharge to cause or contribute to an exceedance of the water quality standards with allowed dilution. Part V.E. above details the process for determining reasonable potential.

Table 8. Reasonable Potential Analysis for Total Ammonia										
Projected Critical Effluent Concentration (C _d)						Water Quality Standard				
CV	Sample Size	→ TSD Mult.	• C _{max}	= C _d		Acute	Chronic	HH		
1.38	61	1.0	4.3 mg/L	4.3 mg/L		2.33 mg/L	0.77 mg/L	-		
Dilution		Projected Receiving Water Conc. (C _r) in mg/L				Reasonable Potential				
		C _s	• Q _s	+ C _d	• Q _d	/ Q _r	C _r	< or >	WQS	RP?
10% acute		0.05 mg/L	0.99 mgd	4.3 mg/L	0.5 mgd	1.5 mgd	1.5 mg/L	<	2.33 mg/L	no
100% chronic		0.05 mg/L	9.9 mgd	4.3 mg/L	0.5 mgd	10.5 mgd	0.25 mg/L	<	0.77 mg/L	no

- As reasonable potential does not exist, this permit renewal will not include ammonia limits.
 - A monthly monitoring requirement will be required in this permit. This is required because, although there is no RP for total ammonia, dilution with the receiving water is needed to achieve water quality standards.
 - Quarterly upstream monitoring of ammonia, pH, and temperature will be required to provide a data set for analysis in the next permit cycle.
2. **Nitrate Plus Nitrite (N+N):** Nitrate and nitrite are toxic components of total nitrogen, which is a common constituent of domestic wastewater. The human health standard is the only standard that applies to this parameter. Table 10 below shows that reasonable potential does not exist because the projected critical effluent concentration is less than the human health water quality standard without dilution. As reasonable potential does not exist, DEQ is removing the effluent limit and mixing zone for N+N.

Table 9. Reasonable Potential Analysis for Nitrate + Nitrite									
Projected Critical Effluent Concentration (C _d)						Water Quality Standard			
CV	Sample Size	→ TSD Mult.	• C _{max}	= C _d		Acute	Chronic	HH	
1.24	61	1.0	9.3 mg/L	9.3 mg/L		-	-	10 mg/L	

- This permit renewal will not include an effluent limit for nitrate plus nitrite.
 - The monthly monitoring requirement for N+N will be continued to be used in total nitrogen calculations. Additionally, the C_d is close enough to the water quality standard that continued monitoring is necessary.
 - Quarterly upstream monitoring of N+N will be required to provide a data set for analysis in the next permit cycle.
3. **Total Nitrogen and Total Phosphorus:** Montana has a narrative water quality standard found at ARM 17.30.637(1)(e). The 2012-permit included average monthly load limits effective June 1 through September 30. These load limits will be retained in this permit. DEQ find that a discharge of TN and TP at these levels will not cause or contribute to exceedance of the narrative water quality standard. Chinook’s relatively small volume discharge to the Milk River at these levels will not create that produced undesirable aquatic life.
- Total Nitrogen average monthly limit (AML) = 31.1 lb/day
 - Total Phosphorus average monthly limit (AML) = 5.7 lb/d
 - The monthly monitoring June 1st through September 30th requirement will be continued.

D. Whole Effluent Toxicity Testing

Water quality standards require that state water be free from substances attributable to municipal waste that create conditions which are harmful or toxic to human, animal, plant or aquatic life, and provides the basis for whole effluent toxicity (WET) requirements in MPDES permits. Chinook WWTP is a small discharger that discharges only sanitary wastewater with no identified industrial contribution. WET testing was done in 2012-2014 semi-annually five times. Chinook WWTP effluent passed all tests.

- WET testing will not be required in this permit renewal.

VII. Final Effluent Limits

The final effluent limits are a combination of the more stringent of the technology-based and water quality-based effluent limits developed. The final effluent limits in Table 13 will be applied to the discharge at Outfall 001 beginning on the permit effective date and lasting through the term of the permit.

Table 10. Final Effluent Limits - Outfall 001				
Parameter	Units	Average Monthly Limit ⁽¹⁾	Average Weekly Limit ⁽¹⁾	Maximum Daily Limit ⁽¹⁾
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	-
	lb/day	125	188	-
	% Removal	85%	-	-
Total Suspended Solids (TSS)	mg/L	30	45	-
	lb/day	125	188	-
	% Removal	85%	-	-
pH	s.u.	Within the range of 6.0 and 9.0		
<i>E.Coli</i> Bacteria, Summer ⁽²⁾	Number of organisms/100mL	126	252	-
<i>E.Coli</i> Bacteria, Winter ⁽²⁾	Number of organisms/100mL	630	1260	-
Oil and Grease	mg/l	-	-	10
Total Nitrogen, as N ^(3,4)	lb/day	31.1	-	-
Total Phosphorus, as P ⁽⁴⁾	lb/day	5.7	-	-
(1) See Definitions section at the end of the MPDES permit for explanation of terms (2) <i>Escherichia coli</i> bacteria - summer is April 1 through October 31, winter is November 1 through March 31 (3) Calculated as the sum of nitrate + nitrite and total Kjeldahl nitrogen concentrations (4) Seasonal limit applies June 1 – September 30				

VIII. Monitoring and Reporting Requirements

A. Requirement to Monitor and Report

Chinook WWTP must monitor their effluent. The samples collected and analyzed must be representative of the volume and nature of the facility’s discharge. The Required Reporting Value is DEQ’s best determination of a level of analysis that can be achieved by the

majority of commercial, university, or governmental laboratories using EPA-approved methods or methods approved by DEQ, unless another reporting level is specified by DEQ, in writing.

- Monitoring will start with the effective date of the permit and last for the duration of the permit cycle.
- All analytical procedures must comply with the specifications of 40 CFR Part 136.
- Chinook WWTP must submit electronic NetDMR results for each month by the 28th of the following month.
- Enter the maximum weekly average (when weekly average monitoring required) of each month into NetDMR.

B. Monitoring Locations, Frequency, Sample Type, and Calculations

The monitored parameters, their respective monitoring locations, and the reporting requirements are presented in Tables 14 and 15.

1. Influent Monitoring

Influent samples will be collected from raw wastewater influent stream at the base of the screw pumps. Influent monitoring is needed to calculate percent removal for BOD₅ and TSS.

2. Effluent Monitoring

Effluent samples must reflect the nature and effect of the discharge at the frequency presented in Table 14. Samples are to be obtained at the effluent V-notch weir after the UV disinfection system.

Table 11. Monitoring Requirements for Outfall 001					
Parameter ⁽¹⁾	Units ⁽²⁾	Sample Type ⁽³⁾	Minimum Frequency	Reporting Requirement	RRV ⁽⁴⁾
Flow	mgd	Instantaneous	Continuous	Daily Maximum Monthly Avg Flow	-
Temperature	°C	Instantaneous	1/Day	Weekly Maximum Monthly Average	0.1
Biochemical Oxygen Demand (BOD ₅)	mg/L	Composite	1/Week	Weekly Average	2
	lb/day	Calculated	1/Month	Monthly Average	-
	% Removal	Calculated	1/Month	Monthly Average	-
Influent (BOD ₅)	mg/L	Composite	1/Week	Monthly Average	2
Total Suspended Solids (TSS)	mg/L	Composite	1/Week	Weekly Average	10
	lb/day	Calculated	1/Month	Monthly Average	-
	% Removal	Calculated	1/Month	Monthly Average	-
Influent TSS	mg/L	Composite	1/Week	Monthly Average	10
pH	s.u.	Instantaneous	1/ Day	Daily Minimum Daily Maximum	0.1
<i>E.Coli</i>	Number of Organisms/100ml	Grab	1/ Week	Monthly Average Weekly Average	1/100mL
Oil and Grease	mg/l	Grab	2/Year ⁽⁵⁾	Monthly Maximum	1.0
	Presence	Daily	Observation	Present/Absent	-

Total Ammonia, as N	mg/L	Composite	1/ Week	Weekly Average Monthly Average	0.07
Nitrate plus Nitrite, as N	mg/L	Composite	1/Month	Monthly Average	0.02
Kjeldahl Nitrogen, as N	mg/L	Composite	1/Month ⁽⁷⁾	Monthly Average	0.225
Total Nitrogen, as N ⁽⁶⁾	mg/L	Composite	1/Month ⁽⁷⁾	Monthly Average	0.01
	lb/day	Calculated	1/Month ⁽⁷⁾	Monthly Average	-
Total Phosphorus, as P	mg/L	Composite	1/Month ⁽⁷⁾	Monthly Average	0.001
	lb/day	Calculated	1/Month ⁽⁷⁾	Monthly Average	-

(1) All parameters are effluent unless otherwise noted.
 (2) See narrative discussion in Part I.C of the permit for additional details on calculating load and percent removal.
 (3) See Definition section at end of permit for explanation of terms.
 (4) Required Reporting Value.
 (5) Samples must be taken in the first half and second half of the year, at least 6 months apart.
 (6) Calculated as the sum of nitrate + nitrite and total Kjeldahl nitrogen concentrations.
 (7) Monitoring requirement applicable during June 1 – September 30.

3. Upstream/Ambient Monitoring

- Chinook WWTP will be required to monitor ambient data quarterly from 2021 through 2023 as specified in Table 15.
- Monitoring must take place at a consistent location below the confluence with the Milk River and upstream and outside the influence of Outfall 001 with the sample type, frequency, and required reporting values (RRVs) as identified in Table 15. The value will be reported on the facility’s discharge monitoring reports.

Table 12. Upstream/Ambient Monitoring Requirements for Outfall 001				
Parameter	Units	Sample Type ⁽¹⁾	Minimum Frequency	RRV ⁽²⁾
Total Ammonia, as N	mg/L	Grab	Quarterly	0.07
Nitrate plus Nitrite, as N	mg/L	Grab	Quarterly	0.02
pH	s.u.	Instantaneous	Quarterly	0.1
Temperature	°C	Instantaneous	Quarterly	0.1

(1) See Definition section at end of permit for explanation of terms.
 (2) Required Reporting Value.

IX. Public Participation

A. Public Notice

DEQ issued a public notice stating that a tentative decision has been made to issue an MPDES permit to the Town of Chinook and that a draft permit, fact sheet, and environmental assessment (EA) have been prepared. Details are below:

- Public Notice No. MT-20-15 dated October 19, 2020
- Public comments are invited any time prior to the close of business November 20, 2020
- Comments may be directed to:

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

or

DEQWPBPublicComments@mt.gov

- 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 and issue a final decision within sixty days of the close of the public comment period or as soon as possible thereafter.

All persons, including the applicant, who believe any condition of the 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.

B. Notification of Interested Parties

Copies of the public notice were mailed to the discharger, state and federal agencies, and persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit.

In addition to mailing the public notice, a copy of the notice and applicable draft permit, fact sheet and EA were posted on DEQ's website for 30 days. Any person interested in being placed on the mailing list for information regarding the MPDES permit should contact DEQ, reference this facility, and provide a name, address, and email address.

C. Public Hearing

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.

D. Permit Appeal

After the close of the public comment period DEQ will issue a final permit decision, which is a final decision to issue, deny, modify, revoke and reissue, or terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted, or the applicant files an appeal.

The Applicant may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review
Department of Environmental Quality
1520 East Sixth Avenue
PO Box 200901
Helena, Montana 59620-0901

E. Additional Information

Requests for additional information or questions regarding this permit should be directed to the Water Protection Bureau at (406) 444-5546

X. Information Sources

Administrative Rules of Montana Title 17 Chapter 30 – Water Quality

- Subchapter 2 – *Water Quality Permit and Application Fees*
- Subchapter 5 – *Mixing Zones in Surface and Ground Water*
- Subchapter 6 – *Montana Surface Water Quality Standards and Procedures*
- Subchapter 7 – *Nondegradation of Water Quality*
- Subchapter 12 – *Montana Pollutant Discharge Elimination (MPDES) Standards*
- Subchapter 13 – *Montana Pollutant Discharge Elimination (MPDES) Permits*

CWAIC: Clean Water Act Information Center, Department of Environmental Quality.
Accessed August 2020.

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.

Integrated 303(d) Water Quality Report for Montana (2018 and 1996).

Montana Code Annotated (MCA), Title 75-5-101, *et seq.*, “Montana Water Quality Act.”

Montana DEQ. 2015. *Compliance Evaluation Inspection Report, City of Chinook WWTP.*

Montana DEQ. 2017. *Department Circular DEQ-7, Montana Numeric Water Quality Standards.*

Montana DEQ. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0020125

- Administrative Record
- Renewal Application Forms DEQ-1 and EPA Form 2A, September 2016

US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

US EPA NPDES *Permit Writers’ Manual*, EPA 833-B-96-003, September 2010.

US EPA. *EPA Region VIII Mixing Zones and Dilution Policy*. December 1994 (Updated September 1995)

US EPA *Technical Support Document for Water Quality-Based Toxics Control*, EPA/505/2-30-001, March 1991.

USGS, Montana StreamStats, SIR 2015-5019, 2015.