

**Montana Department of Environmental Quality ▪ Water Quality Division
Montana Pollutant Discharge Elimination System (MPDES) ▪ Fact Sheet**

Town of Kevin Wastewater Treatment Facility ▪ MT0030244

Permit Number: MT0030244
Permittee: Town of Kevin
Receiving Water: Unnamed Dry Lake
Facility Information: Town of Kevin Wastewater Treatment Facility
42 Lagoon Road
Kevin, MT 59454
Facility Contact(s): Bob Fagan, Mayor
Juan Kelly, Public Works Director
PO Box 137
Kevin, MT 59454
Type of Facility: Minor Publicly Owned Treatment Works
Type of Treatment: Three-cell aerated lagoon system with solar processors and no disinfection
Number of Outfalls: 1
Outfall Type: 001 – Facility Discharge
Outfall Location: latitude 47.5858 N, longitude 110.8106 W
Fact Sheet Date: January 2018
Permit Writer: Joanna McLaughlin



Discharge Elimination System (MPDES) permit for the Town of Kevin Wastewater Treatment Facility, MT0030244. This fact sheet documents the legal requirements and technical rationale that serve the decision-making process involved with developing effluent limits, appropriate monitoring and reporting requirements, and special conditions which are specific to the facility.

I. Summary

A. Facility and Permit Changes

- Kevin installed fencing around the discharge site to keep people away from the discharge. This was a condition of an Administrative Order on Consent.
- Because Kevin eliminated the direct risk to human health by recreational contact, the facility is no longer required to disinfect.

B. Proposed Effluent Limits and Monitoring Requirements

- National Secondary Standards for 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS) continue
- The pH limit of 6.0-9.0 will be maintained
- Kevin will be required to report the duration of discharge (days/month) each monitoring period
- Nondegradation load allocations will be maintained
- The *Escherichia coli* limit and monitoring requirement will be removed.

II. Background Information

A. Permit Status and Details Leading to Administrative Extension of the Permit

- October 1, 2011: 2011-issued permit became effective
- September 30, 2016: 2011-issued permit expired
- November 3, 2016: permit administratively extended

B. Facility Description and Design Criteria Summary

Discharge is to an unnamed ephemeral lake. The unnamed dry lake does not currently retain water except after precipitation events or when the facility is discharging, but quickly dries.

The existing wastewater treatment facility (WWTF) is a three-cell, accelerated lagoon system that typically discharges semi-annually. Each cell is equipped with solar operated processors to enhance oxygen transfer through the water. Ultraviolet disinfection is installed, but it is not operational. **Figure 1** shows a line drawing of the WWTF, and **Table 1** summarizes the design criteria.

Figure 1. Kevin Wastewater Treatment Facility Flow Diagram

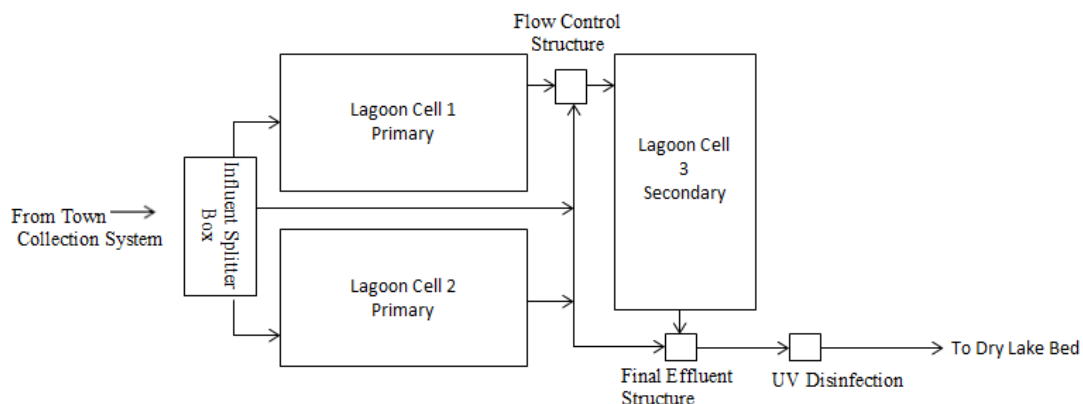


Table 1: Current Design Criteria Summary for Kevin Wastewater Treatment Facility⁽¹⁾

Facility Description: Three-cell aerated lagoon system with solar processors and no disinfection			
Construction Date:	2004	Number of Lagoon Cells:	2 primary, 1 secondary
Design Year:	2023	Total Surface Area:	2.01 acres
Design Population:	200	Surface Area of Cells:	0.67 acres each
Current Population:	174 ⁽²⁾	Total Detention Time:	120 days
Design Flow, Average Daily:	0.03 mgd	Design Flow, Hourly Peak:	0.125 mgd
BOD ₅ Percent Removal:	Unknown	Estimated I/I:	Unknown
Design BOD ₅ Load:	40 lb/day	Bypass Events (Y/N):	Unknown
TSS Percent Removal:	Unknown	SSO Events (Y/N):	Unknown
Design TSS Load:	44 lb/day	Disinfection Type:	None
Flow Measurement, Effluent:	V-notch weir and staff gauge ⁽³⁾	Discharge:	Typically semiannual
Flow Measurement, Influent:	Inline badger magnetic meter	Collection System:	Separate
Sampling Location, Outfall 001:	V-notch weir in effluent structure		
⁽¹⁾ Information obtained from Morrison Maierle. 2003. <i>Operation and Maintenance Manual, Kevin, MMI Project no. 3213.001.02 Montana</i> unless otherwise stated.			
⁽²⁾ MPDES Permit Number MT0030244. Administrative Record			
⁽³⁾ Montana DEQ. November 2017. <i>Compliance Inspection Report, Town of Kevin Wastewater Treatment Facility</i>			

C. Existing Permit Requirements and Effluent Quality

The past five years of effluent characteristic data reported on Discharge Monitoring Reports by Kevin is summarized in **Table 2**.

Table 2. Kevin Effluent Characteristics, January 2012 – October 2017

	Parameter	2011 Limit ⁽¹⁾	Minimum	Maximum	Average	Samples
	Flow, Daily Average (mgd)	⁽²⁾	0.007	0.056	0.023	21
5-Day Biochemical Oxygen Demand (BOD ₅)	Influent Concentration (mg/L)	⁽²⁾	1.00	208	98.8	12
	Effluent Concentration (mg/L)	30/45	3.00	65.0	22.6	2
	Calculated Percent Removal	85	31.0	125	82.6	22
	Calculated Load (lb/day)	7.5/11.3	0.75	12.0	3.92	21
Total Suspended Solids (TSS)	Influent Concentration (mg/L)	⁽²⁾	1.00	787	130	12
	Effluent Concentration (mg/L)	30/45	10.0	142	46.0	22
	Calculated Percent Removal	85	-200 ⁽³⁾	1305	85.4	23
	Calculated Load (lb/day)	77	1.60	15.2	7.64	23
<i>Escherichia coli</i> Bacteria ⁽⁴⁾	Summer (org/100 mL)	200/400	10	720	262	12
	Winter (org/100mL)	1,000/2000	4	24200	4456	9
	pH (s.u.)	6.0 - 9.0	7.7	8.9	8.3	20
	Total Residual Chlorine (mg/L)	⁽⁵⁾	0.070	0.13	0.090	7
	Fecal Coliform (number/100 mL)	⁽⁵⁾	30	17300	2003	14
⁽¹⁾ Average monthly limit / average weekly limit						
⁽²⁾ No limit in previous permit; monitoring requirement only						
⁽³⁾ Possible calculation error, value verified in Discharge Monitoring Reports						
⁽⁴⁾ Geometric is reported for <i>E. coli</i> . Summer is April 1 through October 31. Winter is November 1 through March 31						
⁽⁵⁾ No permit limit for total residual chlorine or fecal coliform. Requirement of the Administrative Order on Consent						

III. Rationale for Effluent Limits

Effluent limits are developed on a parameter-by-parameter basis, and are evaluated as technology-based effluent limits or water quality-based effluent limits. Some pollutants are assessed under both categories, and ensure the most stringent of these limits will be applied in the permit. This section will provide rationale and legal requirements for developing limits for each parameter.

Technology-based effluent limitations (TBELs) represent the minimum treatment requirements implemented in MPDES permits. The limits are based on widely available technologies to treat pollutants.

Water quality-based effluent limitations (WQBELs) are established, where necessary, to attain and maintain Montana numeric and narrative water quality standards, and are designed to protect the beneficial uses of the receiving water.

A. Technology-Based Effluent Limits (TBELs)

1. Applicable Effluent Limit Guidelines

Technology-based effluent limits are the minimum level of treatment or control a point source must achieve based on actual, available control technologies. Federal regulations establish secondary treatment standards or the equivalent for publicly owned treatment works (POTW). Montana adopted the federal secondary treatment regulation as well as the requirements for establishing technology-based discharge limitations.

Secondary treatment standards are defined in terms of effluent quality as measured by pH, 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and percent removal of BOD₅ and TSS. These standards are based on application of biological treatment.

Waste stabilization ponds are eligible for treatment equivalent to secondary standards if the BOD₅ and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the minimum level of effluent quality requirements.

Although Kevin meets some requirements for consideration of treatment equivalent to secondary standards, proper operation and maintenance is uncertain:

- Four consecutive months of reported data document a negative percent removal for total suspended solids
- Several of the monthly average TSS effluent concentrations reported exceed the limit by a factor of two or more
- Kevin responded to some noncompliance letters with explanation that the person taking samples did not understand the sampling and monitoring procedures

Kevin will continue to be held to National Secondary Standards for both BOD₅ and TSS. See Table 2.

2. Mass-based Effluent Limitations

Effluent limitations must be expressed in terms of mass, identified as load (pounds (lb)/day) for municipal treatment plants. Kevin's load limits were calculated by multiplying the facility's average daily design flow and the national secondary treatment standards for concentration of each pollutant by a conversion factor:

- $BOD_5 \text{ and TSS monthly average load} = 0.03 \text{ mgd} \times 30 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 7.5 \frac{\text{lb}}{\text{day}}$
- $BOD_5 \text{ and TSS weekly average load} = 0.03 \text{ mgd} \times 45 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 11.3 \frac{\text{lb}}{\text{day}}$

3. Nondegradation Load Allocations

Monthly average loading limits for the technology-based parameters of concern are equal to the more stringent of nondegradation allocations and calculated the mass-based loading limits.

Nondegradation threshold values for Kevin WWTF were originally calculated for BOD₅ and TSS in 1993 using the same average daily design flow of 0.03 mgd and National Secondary Standard of 30 mg/L. These values were compared to the actual average loads discharged from the facility for the period of record, as shown below:

<u>Nondegradation Allocated Limits</u>		<u>Actual Average Monthly Load (lb/day)</u>					
Parameter	Load (lb/day)	2012	2013	2014	2015	2016	2017
BOD ₅	7.5	3.44	No	6.42	3.45	4.72	5.04
TSS	7.5	7.06	Data	2.88	3.9	11.92	9.36

The exceedances of annual loads in 2016 and 2017 were compliance related, so Kevin is an existing source.

4. Final Technology-Based Effluent Limits

The renewed permit will retain TBELs based on National Secondary Standards for BOD₅ and TSS, as shown in **Table 3**.

Parameter		Effluent Limits	
		Average Monthly	Average Weekly
5-Day Biochemical Oxygen Demand (BOD ₅)	Concentration (mg/L)	30	45
	Calculated Percent Removal	85	-
	Calculated Load ⁽¹⁾ (lb/day)	7.5	11.3
Total Suspended Solids (TSS)	Concentration (mg/L)	30	45
	Calculated Percent Removal	85	-
	Calculated Load ⁽¹⁾ (lb/day)	7.5	11.3
pH (s.u.)		6.0 - 9.0 (instantaneous)	
⁽¹⁾ Load limits are based on nondegradation load allocation.			

B. Water Quality-Based Effluent Limits (WQBELs)

After TBELs are established, it must be determined whether the discharge will cause or have the reasonable potential to cause or contribute to an excursion above any water quality standard. WQBEL development determines how the receiving water could be potentially impacted by existing and proposed discharges.

1. Applicable Standards

Water quality-based effluent limits (WQBELs) are designed to protect state water quality standards and are required when TBELs are not adequate to protect state water quality standards. 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.

2. Receiving Water

Wastewater is discharged from the wastewater treatment facility to an unnamed lake for which the United States Geological Survey (USGS) water resources database does not contain any data. DEQ considers the

unnamed dry lake as ephemeral. That is, the stream flows only in response to precipitation or snowmelt in the immediate watershed. **Table 4** summarizes the receiving water characteristics.

Table 4. Receiving Water Characteristics – Unnamed Dry Lake	
Water Use Classification:	B-2, Ephemeral dry lake
Watershed:	Marias
USGS Hydrological Unit Code:	HUC 10030203
Ambient Monitoring Station:	None
TMDL:	None
Identified as Impaired ⁽¹⁾ :	Not on 2016 303(d) list of impaired streams
⁽¹⁾ None of the impairments on the main stem of the Marias River include wastewater effluent causes or sources	

The unnamed dry lake is not subject to the specific water quality standards of B-2 waters because of its ephemeral nature. DEQ anticipates the effluent to infiltrate prior to reaching the nearest perennial water body, and therefore does not have reasonable potential to cause or contribute to an exceedance of water quality standards.

3. Pollutants of Concern

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. Identification of a pollutant of concern (POC) is not an indication that WQBELs are necessary, but an indication that further evaluation is required.

This subsection describes the approach to determine the need for WQBELs. Parameters typically present in municipal wastewater that may cause or contribute to a violation of water quality standards include:

- **BOD5, TSS, and pH:**

These parameters are typical effluent quality indicators and are regulated as TBELs.

- No additional limits are necessary - TBELs adequately control these pollutants.

- ***Escherichia coli* Bacteria and Total Residual Chlorine:**

The 2011-issued permit included *Escherichia coli* (*E. coli*) as a WQBEL because of the need to be protective of human health due to the opportunity for recreational contact. However, a requirement of an Administrative Order on Consent that closed in 2015 when Kevin installed fencing and signs around the ephemeral dry lake bed to prevent exposure to treated wastewater.

Because the opportunity for recreational contact no longer exists, DEQ will remove the *E. coli* limit. For the same reason, there is no requirement to disinfect.

DEQ anticipates the effluent to infiltrate prior to reaching the nearest perennial water body, and therefore does not have reasonable potential to cause or contribute to an exceedance of water quality standards.

- The *E. coli* limit and monitoring requirement will be removed.
- There will be no disinfection requirement.

IV. 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 limitations in **Table 5** will be applied to the discharge at Outfall 001 beginning on the permit effective date and lasting through the term of the permit.

Parameter		Effluent Limits	
		Average Monthly	Average Weekly
5-Day Biochemical Oxygen Demand (BOD ₅)	Concentration (mg/L)	30	45
	Calculated Percent Removal	85	-
	Calculated Load ⁽¹⁾ (lb/day)	7.5	11.3
Total Suspended Solids (TSS)	Concentration (mg/L)	30	45
	Calculated Percent Removal	85	-
	Calculated Load ⁽¹⁾ (lb/day)	7.5	11.3
pH (s.u.)		6.0 - 9.0 (instantaneous)	
⁽¹⁾ Load limits are based on nondegradation load allocation.			

- There shall be no discharge of floating solids or visible foam other than in trace amounts.
- There shall be no discharge which causes visible oil sheen in the receiving stream.
- There shall be no discharge that settles to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines.

V. Monitoring and Reporting Requirements

A. Requirement to Monitor and Report

Kevin will be required to monitor. 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.

- All analytical procedures must comply with the specifications of 40 CFR Part 136.
- Kevin must submit NetDMR results for each month by the 28th of the following month.

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

Monitoring of wastewater effluent will be conducted at the discharge structure, which is the last point of control. Samples will be collected at the effluent v-notch weir after the UV structure and will reflect the nature of the discharge.

Influent monitoring is needed to calculate percent removal for BOD₅ and TSS. Quarterly sampling of wastewater at the influent structure must be performed only during months when discharge occurs. The influent samples will be collected at the inline badger mag meter at the lift station on the west side of the facility.

The monitored parameters, their respective monitoring locations, and the reporting requirements are presented in **Table 6**. Reporting is required monthly for all parameters.

Table 6. Monitoring and Reporting Requirements for Outfall 001

<u>Parameter</u>		<u>Frequency</u> ⁽¹⁾	<u>Type</u> ⁽²⁾	<u>Reporting Requirements</u> ^{(3),(4)}	<u>RRV</u> ⁽⁵⁾
Effluent Flow Rate (mgd)		1/Week	Instantaneous	Mo Avg, Daily Max	-
Duration of Discharge (days/month)		Continuous	Calculated	Total	-
5-Day Biochemical Oxygen Demand (BOD ₅)	Influent Concentration (mg/L)	1/Quarter	Composite	Mo Avg	10
	Effluent Concentration (mg/L)	1/Month	Grab	Mo Avg, Wk Max	10
	Percent Removal ⁽⁶⁾	1/Month	Calculated	Mo Min	-
	Effluent Load (lb/day)	1/Month	Calculated	Mo Avg, Wk Max	-
Total Suspended Solids (TSS)	Influent Concentration (mg/L)	1/Quarter	Composite	Mo Avg	10
	Effluent Concentration (mg/L)	1/Month	Grab	Mo Avg, Wk Max	10
	Percent Removal ⁽⁶⁾	1/Month	Calculated	Mo Min	-
	Effluent Load (lb/day)	1/Month	Grab	Mo Avg, Wk Max	-
Effluent pH (s.u.)		1/Month	Instantaneous	Minimum Maximum	0.1

⁽¹⁾ Monitoring required during periods with discharge. Minimum Frequency.

⁽²⁾ See Definition section at end of permit for explanation of terms.

⁽³⁾ Monthly Average: If only one sample is collected then it is considered the monthly average and reported on the Discharge Monitoring Report. Weekly Average: If only one sample is collected during the calendar week it is considered the weekly average. The highest weekly average of the monitoring period shall be reported as the maximum weekly average on the Discharge Monitoring Report. In cases where only one sample is collected during the entire monitoring period, that sample shall be reported as both the monthly average and maximum weekly average.

⁽⁴⁾ If no discharge occurs during the reporting period, "no discharge" shall be reported on the NetDMR.

⁽⁵⁾ See Circular DEQ-7 for more information on RRVs. Analysis must achieve these, or lower, reporting limits.

⁽⁶⁾ Percent removal shall be calculated using the monthly average values.

VI. Special Conditions

A. Lagoon Operation and Maintenance Requirements

Kevin must properly operate and maintain all facilities and systems of treatment and control at all times. A wastewater treatment system must have an Operation and Maintenance (O&M) manual developed at the time of construction and/or upgrade. Each permitted facility is required to:

- Maintain an up-to-date O&M manual
- Follow the procedures in the O&M manual
- Conduct inspections at least monthly to ensure the O&M procedures are being followed and are working
- Maintain records of the routine inspections and any follow-up

B. Sewage Sludge

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

VII. Public Participation

A. Public Notice

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

- Public Notice No. MT-18-04 dated February 12, 2018
- Public comments are invited any time prior to the close of the business March 14, 2018.

- 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 interested 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 this 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.

Kevin 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 406-444-3080.

VIII. 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. 2017.
<http://deq.mt.gov/Water/WQPB/cwaic>. Accessed October 2017.

Morrison-Maierle, Inc. 2003. *Operation and Maintenance Manual, Wastewater Collection and Treatment Facilities, Kevin, Montana, MMI Project no. 3213.001.02.*

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

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

Montana DEQ. 2014. *Compliance Inspection Report, Town of Kevin Wastewater Treatment Facility*

Montana DEQ. 2017. *Compliance Inspection Report, Town of Kevin Wastewater Treatment Facility*

Montana DEQ. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0030244

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

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

US Code of Federal Regulations, 40 CFR Part 503 – *Standards for the Use or Disposal of Sewage Sludge.*

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.

USGS 2017: USGS Water Data for Montana. *Water Resources of the United States.*