U.S. EPA Region 8 NPDES Desk Audit Report

National Database Information	
Desk Audit Date(s): **April 4, 2022 – April 8, 2022**	Evaluation Type: **Desk Audit**
NPDES ID Number: **MT0030295**	Type of Facility: **Wastewater Treatment Facility, Minor**
Permit Issuing Authority: **State of Montana**	Name of receiving water(s): **Musselshell River**
Permit Effective Date: **November 1, 2013**	Permit Expiration Date: **October 31, 2018**
Latitude: **46.450242°N**	Longitude: **-108.524299°W**
Evaluator and affiliation: **Lisa-kay Prideaux, U.S. EPA Region 8**	
Facility Location Information	
Site/Facility Location: **Roundup Wastewater Treatment Facility** **US Highway 12 E** **Roundup, Montana** **Musselshell County**	Desk Audit Recipient Mailing Address: **Sandra Jones, Mayor** **City of Roundup** **34 3rd Ave W, Roundup, Montana 59072** **roundupmayor@yahoo.com**

Contact Information	
	Name/Title:
Facility Contact(s):	**Lon Sibley, Public Works Director 406-323-2804 /** (b) (6)

Desk Audit Review and Signature		
Drafter Name:	Date:	Address/Phone:
Lisa-kay Prideaux		**U.S. EPA Region 8** **8MO** **10 West 15th Street** **Helena, Montana 59626** **406-457-5022**
Management Reviewer Name/Signature/Date:		Address/Phone:
Boeglin, Michael Digitally signed by Boeglin, Michael Date: 2022.06.09 16:37:24 -06'00'		**U.S. EPA Region 8** **8ENF-W-NW** **1595 Wynkoop Street** **Denver, CO 80202** **303-312-6250**
NPDES and Wetlands Enforcement Section Supervisor		

Evaluation Narrative

Introduction and Background

Beginning April 4, 2022, and concluding April 8, 2022, I, Lisa-kay Prideaux, a U.S. Environmental Protection Agency (EPA) inspector, conducted a desk audit of the Roundup Wastewater Treatment Facility (facility). The facility is located to the east of city limits, in Musselshell County, Montana. The facility is owned and operated by the City of Roundup. The facility is authorized to discharge treated wastewater from the facility into Musselshell River, subject to the conditions of National Pollutant Discharge Elimination System (NPDES) permit MT0030295 (permit). The purposes of the desk audit were to compile and review reported effluent monitoring data and noncompliance for the facility, determine whether the facility's compliance status was accurately reflected in EPA databases, and virtually meet with facility representatives to discuss facility operations and ways to ensure compliance with permit conditions.

Facility Overview

The City of Roundup (city) operates a three-celled aerated lagoon system (facility). The three cells consist of a sedimentation cell and two aerated cells. The aerated cells operate in a series and have a designed operating depth of 15 feet. The sedimentation basin has a designed operating depth of eight feet. The facility has two permitted discharge points; outfall 001 is permitted to discharge directly to the Musselshell River; outfall 002 discharges into a wetland area south of the facility. The city discharges almost exclusively through outfall 002. An ultra-violet disinfection system is used to disinfect wastewater prior to discharge.

The current permit expired on October 31, 2018 and has been administratively continued. The permit required the city to contract with a consulting engineering firm to evaluate the existing facility, along with the current operation and maintenance, and recommend improvements needed in treatment, operations and/or maintenance to meet the 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) and the total suspended solids (TSS) limits of the permit on a consistent basis. An evaluation report was submitted to Montana DEQ on December 31, 2015.

The 2015 evaluation report identified four probable causes of violations: detention time, aeration, mixing, and sludge accumulation. The evaluation report stated the theoretical detention time under aeration is 42.8 days under the design flow and 100 days under the existing flows, but the lagoons were not being operated at their maximum level. Based on sludge levels measured in 2009, the measured water level in the first cell is nine feet deep and the second cell is 10 feet deep. With those assumed measurements, the detention time would be 70 days based on the current flow rates assuming no sludge is present. There was also suspected short circuiting in one of the lagoon cells. Under those scenarios actual detention time under aeration is much shorter than the theoretical detention time and is contributing to insufficient $CBOD_5$ removal. The sedimentation basin is also not being operated at maximum water level and due to estimated sludge levels, it was estimated to be operating at approximately half its maximum water, which could be a source of TSS exceedances. It was also suggested that aeration entering the lagoons is not being mixed thoroughly throughout the wastewater column which could be causing performance problems.

The evaluation report stated mixing may also be inadequate since the aerated cells are designed to operate at 15 feet which would provide approximately 10 feet of water column between the diffuser and the surface. With the lagoons only operating at two thirds of the design water level, there is only four to five feet of water column to allow for the air to mix the water. The report states that may not be enough mixing to allow for effective treatment during turnover events. The stratification of moving aerated water above the diffusers and more stagnant, anaerobic water below the diffusers causing the lagoons to function more as a facultative system than an aerated system. The sludge levels were not measured for the report but instead used the 2009 measurements

and sludge accumulation rates to estimate the sludge layer is approximately 1 to 2.5 feet. Sludge accumulation can create additional $CBOD_5$ and TSS load in the lagoon caused by organic and inorganic material release from the sludge.

Montana DEQ technical assistance staff along with Steve Harris conducted a thorough optimization study at the facility in June 2019. The summary of the optimization report included recommendations to remove sludge to restore treatment efficiency to its original and intended levels. The report also stated the greater treatment efficiency could be restored by returning operations to the original 15-foot designed operating depths and adding a riser to the discharge pipe of cell #3. The study concluded, "The Roundup wastewater pond system will meet permit limits consistently once the sludge is removed, a riser pipe is installed, and the treatment cells are allowed to run at the deeper design depths."

In April 2020, the city raised the levels in the first two cells of the treatment system by approximately five feet by adjusting a valve to increase the levels. The city did not discharge for the month of April as the levels increased. The city has not completed any sludge removal from any of the cells. Since April 2020, the facility has had two *Escherichia coli* (*E. coli)* bacteria, five TSS, and 33 $CBOD_5$ effluent exceedances. These exceedances suggest the increased operating depths are not adequate and the sludge will need to be removed to add additional detention time for adequate treatment to occur.

Communication with Facility Contacts

EPA called facility representative Lon Sibley on March 4, 2022, to discuss the parameters, documentation, and timeframe of the Desk audit. I spoke to Lon again on April 8, 2022, after reviewing all submitted materials to discuss desk audit observations.

Communication with State Contacts:

I spoke with the State of Montana's Department of Environmental Quality (MDEQ) Compliance Training and Technical Assistance Section Supervisor Darryl Barton on January 25, 2022, asking for guidance on state permitted facilities within the parameters of this desk audit; a facility in, or repeatedly in SNC, that does not have a current active enforcement case with the State, and that has not had an inspection in either FY21 or planned in FY22. A list of facilities was provided to Mr. Barton, and with input from him, the City of Roundup was selected as meeting the criteria.

On March 21, 2022, I contacted the State's compliance inspector who conducted the last inspection on October 15, 2020, Daniel Freeland, to obtain a copy of the report, which was provided along with associated MDEQ records for this facility.

Desk Audit Activities

I began the desk audit by reviewing MDEQ's current permit and Statement of Basis for the facility, as well as the October 15, 2020, inspection report and findings. I requested the facility send all monitoring data for the facility's outfall location as well as the groundwater monitoring data for the five (5) wells specified in the current permit. The timeframe reviewed was from January 1, 2019, through December 31, 2021. All internal monitoring data as well as outside laboratory data for all parameters within the discharge permit was submitted for review. I also compared the submitted information to monitoring data available via the EPA's Integrated Compliance Information System (ICIS) database, and NetDMR. MDEQ's compliance inspection reviewed the same data for monitoring periods ending June 30, 2020, and July 31, 2020; therefore, I did not review these two monitoring periods. Findings, Corrective Actions, and Recommendations pursuant to the desk audit are discussed in the section below.

Findings, Corrective Actions, and Recommendations

Finding 1:
The facility reported effluent limitation excursions on the occasions listed in the table below:

ICIS Violations Report for MT0030295: 01/01 2019 – 12/31/2021 (excluding 06/30/2020 & 07/31/2020 monitoring periods)

Parameter	Monitoring Period End Date	Monitoring Location	Units	Limit Type
pH	11/30/2020	Effluent Gross	Standard Units	Daily Maximum
CBOD	01/31/2019*, 06/30/2019*, 12/31/2019*, 01/31/2020*, 02/29/2020*, 03/31/2020*, 08/31/2020, 09/30/2020*, 12/31/2020*, 01/31/2021*, 02/28/2021*, 03/31/2021*, 06/60/2021*, 08/31/2021*, 12/31/2021*	Effluent Gross	mg/L	30Day AVG
	01/31/2019*, 06/30/2019*, 01/31/2020, 02/29/2020*, 03/31/2020*, 12/31/2020, 01/31/2021*, 02/28/2021*, 03/31/2021*	Effluent Gross	lb/day	30Day AVG
	01/31/2019*, 06/30/2019*, 12/31/2019, 01/31/2020, 02/29/2020*, 03/31/2020*, 12/31/2020, 01/31/2021*, 02/28/2021*, 03/31/2021*, 06/60/2021, 08/31/2021	Effluent Gross	%	% Removal
TSS	05/31/2019*, 04/30/2021*, 05/31/2021*	Effluent Gross	mg/L	30Day AVG
	05/31/2021*	Effluent Gross	lb/day	30Day AVG
	05/31/2019*, 05/31/2021*	Effluent Gross	%	% Removal
E. coli Bacteria	07/31/2019*, 08/31/2019*, 08/31/2020*, 06/30/2021*, 08/31/2021	Effluent Gross	CFU/100ml	Weekly Max
Ammonia	01/31/2019*, 02/28/2019*, 03/31/2019*, 04/30/2019*, 05/31/2019*, 06/30/2019*, 07/31/2019*, 09/30/2019*, 10/31/2019*, 11/30/2019*, 12/31/2019*, 01/31/2020*, 02/29/2020*, 03/31/2020*, 08/31/2020, 09/30/2020, 10/31/2020*, 11/30/2020, 12/31/2020*, 01/31/2021*, 02/28/2021*, 03/31/2021*, 04/30/2021*, 05/31/2021*, 06/30/2021, 07/31/2021, 09/30/2021, 10/31/2021	Effluent Gross	mg/L	30Day AVG

* Results in significant noncompliance (SNC) (*An exceedance is SNC when the numeric effluent limit violation is in excess of 40% or greater for Group I Pollutants or an exceedance of 20% or greater for Group II Pollutants. Group I and II Pollutants are defined in 40 CFR 123.45*

Abbreviations:

- CBOD: carbonaceous biochemical oxygen demand
- TSS: total suspended solids
- E. coli: *Escherichia coli*

Permit Requirements:

Effluent limits are required to be met as per Part I.B.2 of MPDES permit MT0030295. Proper operation and maintenance of all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit must be maintained as per Part III.E of MPDES permit MT0030295.

Corrective Action:

In accordance with Parts I.B.2 and III.E of MPDES permit MT0030295, operate and maintain the facility to ensure compliance with effluent limitations and other permit conditions. In a response to the EPA, provide a narrative explaining how the facility intends to ensure compliance with permit effluent limits.

Finding 2:

The facility incorrectly reported sample analysis calculations. Specifically, the facility's November 2020 in-house bench sheet for temperature shows a recorded value of 7°C, and the corresponding DMR shows a reported value of 0.7°C. The September 2020 in-house bench sheet for dissolved oxygen shows a recorded value of 0.52 mg/L, and the corresponding DMR shows a reported value of 5.2 mg/L.

Permit Requirements:

Monitoring results must be reported as required per Parts I.B.2, I.C, II.B, and III.A of MPDES permit MT0030295.

Corrective Action:

Ensure transfer of sample results from bench sheet to DMR are accurately recorded. In a response to the EPA, provide a narrative explaining how the facility intends to ensure compliance with this permit condition.

Finding 3:

Calculation records did not use the correct data to complete calculations. Specifically, the facility did not calculate quarterly or semi-annual averages using all available data. The facility collected monthly dissolved oxygen, but only reported the value taken on the last month of the quarter. The facility also collected quarterly oil & grease samples but only reported the last quarter as the semi-annual result. All data collected during the monitoring period must be used to report on the DMR; therefore, each of the three dissolved oxygen monthly data points must be averaged together prior to submitting quarterly results, and the two oil & grease quarterly samples must be averaged together prior to submitting semi-annual results on the DMR.

Permit Requirements:

Quarterly/Semi-annual average calculations require all samples within the monitoring period to be averaged and reported. Sampling must be completed as required in Parts I.B, I.C, II.A, II.B, II.D, and III.A of MPDES permit MT0030295.

Corrective Action:

Ensure calculations of sample results use all data collected in the monitoring period to ensure DMRs are accurately recorded. In a response to the EPA, provide a narrative explaining how the facility intends to ensure compliance with this permit condition.

Finding 4:

Calculation records did not use the correct data to complete calculations. Specifically, the facility did not calculate data during split weeks correctly (March/April 2020). Weekly average calculations require all samples within the calendar week (Sunday to Saturday) to be averaged, regardless of the month in which they occur. Per Montana DEQ, weekly average should be reported with the month in which four (4) or more weekdays occur. Monthly average calculations require all samples within the calendar month to be averaged and reported. Specifically, the sample collected on March 31, 2020, should be reported as a **weekly** average for the month of

April because March 31, 2020, is a Wednesday and therefore there are 4 additional days of the week that occur in April. The facility correctly used the March 31, 2020, result in monthly calculations.

Permit Requirements:

Sampling and reporting must be completed as required in Parts I.B, I.C, II.A, II.B, II.D, and III.A of MPDES permit MT0030295.

Corrective Action:

Ensure sample results and calculated sample results are accurately reported. In a response to the EPA, provide a narrative explaining how the facility intends to ensure compliance with this permit condition.

Finding 5:

Calculation records did not use the correct data to complete calculations. Specifically, non-detected (ND) parameters were reported as a zero (0). The following parameters, monitoring periods, and reported values were noted:

Parameter Name	Monitoring Location	Monitoring Period end date	Analytical Result	Reported result	Calculations required
Total suspended solids	001	September 30, 2019, October 31, 2019, September 30, 2020, October 31, 2020, November 30, 2020, December 31, 2020, September 30, 2021, October 31, 2021	ND	0	Percent removal, Loading
Oil and grease	001	March 31, 2019, June 30, 2019, September 30, 2019, December 31, 2019, March 31, 2020, June 30, 2020, September 30, 2020, December 31, 2020, March 31, 2021, June 30, 2021, December 31, 2021	ND	0	None
Ammonia	MW1	June 30, 2019, December 31, 2019, December 31, 2020	ND	0	None
Nitrate + Nitrite	MW5	June 30, 2019, December 31, 2019, December 31, 2020, December 31, 2021	ND	0	None

Data is required to be reported in the NetDMR system as it is reported on the laboratory analytical data reports. When reporting "ND" or "<" (less than) values for a single sample (once per month), the facility must utilize the no data indicator (NODI) code "9 - data below detection limit" as the reported value. When using the ND value in a calculation, the facility must use the reporting limit noted on the laboratory analytical report (typical TSS analytical reporting limit is 10) in the calculation and the final number reported on the DMR must include a "<" symbol.

Permit Requirements:

Sampling and reporting must be completed as required in Parts I.B, I.C, II.A, II.B, II.D, and III.A of MPDES permit MT0030295.

Corrective Action:

Ensure calculations and the reporting of sample results are accurately conducted and reported. In a response to the EPA, provide a narrative explaining how the facility intends to ensure compliance with this permit condition.

Finding 6:
The facility did not report sample analysis results. Specifically, for outfall 001, the facility is collecting permit required samples for total dissolved solids, total nitrogen, total phosphorus, arsenic, cadmium, chromium, lead, mercury, selenium, silver, and hardness; however, the results are not being submitted. The facility's quarterly and semi-annual DMRs do not have a location for the facility to report calculated and/or analytical results for the noted parameters.

Permit Requirements:

Sampling and reporting must be completed as required in Parts I.B, I.C, II.A, II.B, II.D, and III.A of MPDES permit MT0030295.

Corrective Action:

Although NetDMR does not currently have a location to report required sample results, results must be reported. The facility can either enter the information in the comment section of the DMR or attach the analytical reports to the corresponding quarterly/semi-annual DMR. In a response to the EPA, provide a narrative explaining how the facility intends to ensure all sample results are reported.