

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

City of Mercer
Attn: Colleen Hinshaw, City Clerk
PO Box 457
Mercer, MO 64661

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

As the Department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the Department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the Department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

April 4, 2018
Effective Date


Edward B. Galbraith, Director, Division of Environmental Quality

April 3, 2020
Expiration Date


Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The existing system is a non-aerated, three-cell, flow-through lagoon with a design flow of 48,000 gallons per day. This project includes the installation of two Reliant Water Technologies Model WQA Water Moving Aerators, each capable of providing 15 lbs. of oxygen per hour and moving approximately 9,000,000 gallons of water per day. One aerator will be installed in Cell No.1 and one will be installed in Cell No. 2. The performance based ability of the WQA unit to reduce nutrient levels and E.coli concentration coupled with existing conditions is the basis to make this proposed improved treatment process a viable option for successful lagoon treatment performance. The aerators will provide aeration and mixing to prevent stratification and turnover events as the first step in reducing effluent concentrations. If necessary to meet effluent limitations, future improvements such as filtration, additional nutrient reduction technologies, or ultraviolet disinfection may be incorporated into the system. The proposed project is intended to meet final effluent limits and address noncompliance issues.

This project will also include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make a complete and usable wastewater treatment facility.

II. COST ANALYSIS FOR COMPLIANCE

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a “finding of affordability” on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

The Department is not required to determine Cost Analysis for Compliance because the permit contains no new conditions or requirements that convey a new cost to the facility.

III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.
2. All construction shall be in accordance with the plans and specifications submitted by Schulte Engineering & Consulting, LLC on December 23, 2017.
3. The Department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(8).
4. State and federal law does not permit bypassing of raw wastewater; therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the Department's Northeast Regional Office per 10 CSR 20-7.015(9)(E)2.
5. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment.
6. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.
7. Wastewater treatment facility shall not be located within one hundred feet (100'), and preferably three hundred feet (300') of any water well or water supply structure.
8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the Department's ePermitting system available online at dnr.mo.gov/env/wpp/epermit/help.htm. See dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.
9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department's Water Protection Program at 573-751-1300 for more information. See dnr.mo.gov/env/wpp/401/ for more information.

10. Upon completion of construction:

- A. The City will become the continuing authority for operation, maintenance, and modernization of these facilities;
- B. Submit an electronic copy of the as-builts if the project was not constructed in accordance with previously submitted plans and specifications; and
- C. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit renewal be processed and issued.

REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The goal of the proposed improvements is to increase the treatment performance of the existing lagoon system to meet anticipated effluent limitations. The proposed aeration units will be used to reduce the BOD, ammonia, and E. coli concentrations in the effluent.

2. FACILITY DESCRIPTION

The Mercer WWTF is located at Intersection of Brant and Allen Lane, Mercer, in Mercer County, Missouri. The facility has a design average flow of 48,000 gpd and serves a population equivalent of approximately 485 people. The existing facility is a four-cell discharge lagoon that discharges to a tributary to Muddy Creek. Proposed construction includes the addition of two aeration units to the existing lagoon system.

3. COMPLIANCE PARAMETERS

The final effluent limits the project is required to meet are established in Missouri State Operating Permit MO-0056057. The proposed project is expected to help the facility meet these final effluent limits in the table below:

EFFLUENT PARAMETER(S)	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE
Biochemical Oxygen Demand ₅ *	mg/L		45	30
Total Suspended Solids*	mg/L		45	30
<i>E. coli</i> ***	#/100mL		1030	206
Ammonia as N (Apr 1 – Sep 30)	mg/L	3.6		1.4
Ammonia as N (Oct 1 – Mar 31)	mg/L	7.5		2.9
Oil & Grease	mg/L	15		10
pH	SU	**		**

- * This facility is required to meet a removal efficiency of 85% or more for BOD₅ and TSS.
- ** The pH is to be maintained in the range of 6.5 -9.0 pH units.
- *** The facility provided information on the proposed aeration and mixing unit's ability to lower *E. coli* concentrations in the effluent. The department has not reviewed this treatment method for its ability to disinfect and therefore cannot ensure that this method will enable the facility to meet *E. coli* effluent limits. If necessary to meet effluent limitations, ultraviolet disinfection may be incorporated into the system.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Existing major components which will remain in use include the following:

- Lagoon Cell No. 1 –Cell No. 1 is currently non-aerated and has a surface area of 2.6 acres and a wastewater volume of 3,893,888 gallons. This cell has 2 foot of freeboard and 5 foot of operating depth. This provides approximately 81 days of retention in Cell No. 1 at the existing design flow.
- Lagoon Cell No. 2 –Cell No. 2 is currently non-aerated and has a surface area of 0.85 acres and a wastewater volume of 1,174,076 gallons. This cell has 2 foot of freeboard and 5 foot of operating depth. This provides approximately 24 days of retention in Cell No. 2 at the existing design flow.
- Lagoon Cell Nos. 3 and 4 – The flow from Cell No.2 flows by gravity to Cell No. 3 or 4. The flow from Cell No. 3 or 4 flows is by gravity to the outfall. Cell Nos. 3 and 4 are designed in parallel or independently and each has a surface area of 0.48 acres, total depth of 14 ft, and a wastewater volume of 1,671,960 gallons. Each of these two cells is currently non-aerated and has 2 foot of freeboard and 12 foot maximum operating depth. This provides approximately 35 days of retention in each Cell Nos. 3 and 4 at the existing design flow.

Construction will cover the following items:

- Lagoon Aerators - The installation of two Reliant Water Technologies Model WQA Water Moving Aerators: one in Cell No.1 and one in Cell No. 2. The aerators will provide aeration and mixing to prevent stratification and turnover events. Each aeration unit will supply approximately 15 lbs. oxygen per hour (360 lbs. oxygen per day) and move approximately 9,000,000 gallons of water per day. The unit in lagoon Cell No. 1 will result in approximately 2.3 turnovers per day and the one unit in Cell No. 2 will result in approximately 7.7 turnovers per day.

The facility provided information on the proposed aeration and mixing unit's ability to lower E. coli concentrations in the effluent. The department has not reviewed this treatment method for its ability to disinfect and therefore cannot ensure that this method will enable the facility to meet E. coli effluent limits. If necessary to meet effluent limitations, ultraviolet disinfection may be incorporated into the system.

Note duplicate aerators are not proposed for the primary cell as parts are readily available and also parts could be taken from the unit in Cell 2 for use in the short term to ensure continued operation of the aerator in Cell 1.

5. OPERATING PERMIT

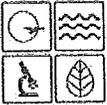
The renewal of operating permit MO-0056057 with the modification of the effluent limitations was successfully public noticed from February 16 to March 19, 2018 with no comments received. This draft renewal incorporated the modification to reflect the proposed construction activities. The facility may modify this renewal back to maintain the current schedule of compliance for ammonia limitations as this upgrade may be the first step in reducing ammonia concentrations and an additional upgrade may be necessary to meet final ammonia effluent limitations. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit renewal be reprocessed and issued retaining the current operating permit interim limits and schedule of compliance until February 28, 2021. This operating permit expires on December 30, 2018.

Keith Forck
Engineering Section
keith.forck@dnr.mo.gov

AP29040
CP0001957

RECEIVED

DEC 22 2017



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
**APPLICATION FOR CONSTRUCTION PERMIT –
WASTEWATER FACILITY**

Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
DATE RECEIVED	CHECK NO.
12-22-17	44466
DATE RECEIVED	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Facility form is for construction pertaining to domestic wastewater treatment facilities, agrichemical facilities, and components thereof. This form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

PART A – BASIC INFORMATION

1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 1.1 Is this a Federal/State funded project? YES N/A Funding Agency: _____ Project #: _____
- 1.2 Is this an application for an agrichemical? YES (See Instructions.) N/A
- 1.3 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
 YES Date of Approval: 7/17/2017
- 1.4 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: _____ NO N/A (If Not Applicable, complete No. 1.5.)
- 1.5 [Complete only if answered Not Applicable on No. 1.4] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
 YES NO
- 1.6 Is a copy of the appropriate plans* and specifications* included with this application?
 YES Denote which form is submitted: Hard copy Electronic copy (See instructions.) NO
- 1.7 Is a summary of design* included with this application? YES NO
- 1.8 Is a general operating permit applicable?
 YES Submit the appropriate operating permit application to the Regional Office at least 60 days prior to operation.
 NO Enclose the appropriate operating permit application and fee submittal. Denote which form: B B2
- 1.9 Is the facility currently under enforcement with the department or the Environmental Protection Agency? YES NO
- 1.10 Is the appropriate fee included with this application? YES NO (See instructions for appropriate fee.)

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT
Lagoon Improvement Project, Installation of Aeration Equipment 2017

2.2 PROJECT DESCRIPTION
Installation of aeration/mixing w&d units in the primary and secondary lagoon cells of the existing 4-cell Wastewater Stabilization Lagoon for the reduction of ammonia and E. coli concentration levels.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Sludge is retained in lagoon.

2.4 DESIGN INFORMATION

A. Current population: 312; Design population: 485

B. Actual Flow: 34,000 gpd; Design Average Flow: 48,000 gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: _____ gpd;
Design Wet Weather Event: _____

2.5 ADDITIONAL INFORMATION

- A. Is a topographic map attached? YES NO
- B. Is a process flow diagram attached? YES NO

2.6 ESTIMATED PROJECT CONSTRUCTION COST

\$ 168,000.00

3.0 WASTEWATER TREATMENT FACILITY				
NAME <i>City of Mercer</i>		TELEPHONE NUMBER WITH AREA CODE <i>660-382-4210</i>		EMAIL ADDRESS <i>citymrcr@grm.net</i>
ADDRESS (PHYSICAL) <i>Intersection of Beant and Allen Ave</i>		CITY <i>Mercer</i>	STATE <i>MO</i>	ZIP CODE <i>64661</i>
COUNTY <i>MERCER</i>				
Wastewater Treatment Facility: <i>Mo-0056057 (Outfall 1 of 1)</i>				
3.1 Legal Description: <i>NE 1/4, SW 1/4, NW 1/4, Sec. 20, T66N, R23W</i> (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): <i>455888</i> Northing (Y): <i>4484084</i> For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: <i>Unnamed tributary to Muddy Creek</i>				
4.0 PROJECT OWNER				
NAME <i>City of Mercer</i>		TELEPHONE NUMBER WITH AREA CODE <i>660-382-4210</i>		EMAIL ADDRESS <i>citymrcr@grm.net</i>
ADDRESS <i>P.O. Box 457</i>		CITY <i>Mercer</i>	STATE <i>MO</i>	ZIP CODE <i>64661</i>
5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.				
NAME <i>City of Mercer</i>		TELEPHONE NUMBER WITH AREA CODE <i>660-382-4210</i>		EMAIL ADDRESS <i>citymrcr@grm.net</i>
ADDRESS <i>P.O. Box 457</i>		CITY <i>Mercer</i>	STATE <i>MO</i>	ZIP CODE <i>64661</i>
5.1 A letter from the continuing authority, if different than the owner, is included with this application. <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A				
5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.				
A. Is a copy of the certificate of convenience and necessity included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.				
A. Is a copy of the as-filed restrictions and covenants included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
6.0 ENGINEER				
ENGINEER NAME / COMPANY NAME <i>Schulte Engineering & Consulting, LLC</i>		TELEPHONE NUMBER WITH AREA CODE <i>816-665-7900</i>		EMAIL ADDRESS <i>von@schulteengineering.com</i>
ADDRESS <i>21 Gates Drive</i>		CITY <i>Platte City</i>	STATE <i>MO</i>	ZIP CODE <i>64079</i>
7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.				
PROJECT OWNER SIGNATURE <i>Colleen Hinshaw</i>				
PRINTED NAME <i>Colleen Hinshaw</i>				DATE <i>11-27-17</i>
TITLE OR CORPORATE POSITION <i>City Clerk WW-D</i>		TELEPHONE NUMBER WITH AREA CODE <i>660-382-4210</i>		EMAIL ADDRESS <i>citymrcr@grm.net</i>
Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM P.O. BOX 176 JEFFERSON CITY, MO 65102-0176				

END OF PART A.

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.