

**STATE OF MISSOURI**  
**DEPARTMENT OF NATURAL RESOURCES**  
**MISSOURI CLEAN WATER COMMISSION**



**CONSTRUCTION PERMIT**

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

O'Sullivan Development, Inc.  
30 Breeana Bay  
Lake Ozark, MO 65049

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.

August 16, 2018  
Effective Date

Edward B. Galbraith  
Edward B. Galbraith, Director, Division of Environmental Quality

August 15, 2020  
Expiration Date

Chris Wieberg  
Chris Wieberg, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

This is a proposed new facility to serve six houses at Lake of Ozarks. Construction will include 3-2,000 gallon septic tank, 3-1,000 gallons STEP unit from there flows will go to a 3,000 gallon flow equalization tank and then be pumped to the one of the 2-3,000 gallon BioMicrobics MBR system operating in parallel for treatment. No disinfection system is proposed with the system as the flow will go through the MBR. The design flow will be 2,220 gpd. With the treatment system, approximately 900 ft of a pressurized collection system will be constructed.

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 complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

### **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 Midwest Engineering on October 30, 2017 and revised on June 1, 2018.
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 Southwest 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](http://dnr.mo.gov/env/wpp/epermit/help.htm). See [dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm](http://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/](http://dnr.mo.gov/env/wpp/401/) for more information.
10. Upon completion of construction:
  - A. Malibu Estates HOA 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 be issued.

#### **IV. REVIEW SUMMARY**

##### **1. CONSTRUCTION PURPOSE**

Construction of a new treatment plant to serve six houses at Lake of the Ozarks. The design flow is 2,200 gpd.

##### **2. FACILITY DESCRIPTION**

The Malibu Pointe Estates WWTP is located at Damsel Road, Lake Ozark, in Camden County, Missouri. The facility has a design average flow of 2,200 gpd and serves a hydraulic population equivalent of approximately 22 people. Construction will include 3-2,000 gallon septic tank, 3-1,000 gallons STEP unit from there flows will go to a 3,000 gallon flow equalization tank and then be pumped to the BioMicrobics MBR system for treatment. No disinfection system is proposed with the system as the flow will go through the MBR.

##### **3. COMPLIANCE PARAMETERS**

The final effluent limits the project is required to meet are established in the Antidegradation review dated April 11, 2018.

PARAMETER	Unit	Daily Maximum	Weekly Average	Monthly Average
Flow	MGD	*		*
BOD <sub>5</sub>	mg/L		30	20
TSS	mg/L		30	20
<i>Escherichia coli</i> **	#/100mL	630		126
Ammonia as N	mg/L	1.7		0.6
PARAMETER	Unit	Minimum		Maximum
pH	SU	6.0		9.0

\* Monitoring only

##### **4. ANTIDEGRADATION**

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated April 11, 2018, due to the facility being new treatment plant to serve six houses. See **APPENDIX B— ANTIDEGRADATION** of the draft operating permit. Effluent limits established as a result of the Antidegradation are listed above under Compliance Parameters.

## **5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA**

The current design guides, 10 CSR 20-8, do not contain design parameters for this configuration of technology or for membrane bioreactors.

### **Construction will cover the following items:**

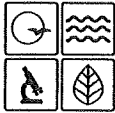
- Septic Tank – A septic tank provides passive primary treatment as the settleable solids in raw wastewater settle onto the bottom of the tank. Raw wastewater will flow from the two houses to a 2,000 gallon septic tank, there will be a total of 3-2,000 gallon septic tanks.
  - The septic tanks provide approximately 2.7 days of detention at design average flow (370 gallons per house x 2 houses = 740 gallons per day; 2,000 gallons/740 gallons = 2.7 days).
  - Settled solids in the septic tank shall be removed by a contract hauler.
    - Annually 0.035 dry tons per year of solids is expected in the septic tanks.
  - The wastewater shall discharge into a 1,000 gallon STEP unit by 4-inch SDR 35 pipe.
- STEP pump units-There will be 3-1,000 gallon STEP units, each with approximately 0.5 days of storage with each STEP unit.
  - The STEP unit will have a 10 gpm simplex pump to pump the water through the 2 inch Schedule 40 PVC forcemain to the flow equalization.
- Flow Equalization tank-There will be 1-3,000 gallon flow equalization tank. This will provide 1.3 days of storage.
  - From the flow equalization tank, there will be 5 gpm duplex pumps to the MBR system.
- Membrane Bioreactor (MBR) – The MBR system is by BioMicrobics. The system will be 2-3,000 gallon systems in parallel.
  - The membrane is a flat plate membrane utilizing a combination of ultrafiltration and microfiltration.
  - The design flux rate through the membranes at peak flow is 4.94 gallons/ft<sup>2</sup>/day (8.4 l/mh) at peak flow with a maximum operating flux of 5.88 gallons/ft<sup>2</sup>/day (10 l/mh).
  - The surface area of the membranes is 56 m<sup>2</sup>
  - The filtration rate through the membranes is 8.0 gpm
  - The minimum design SRT is 30 days
  - The maximum MLSS is 10,000 mg/L
  - The maximum F/M ratio at design flow 0.15
  - Total air supplied through the membrane is 60 scfm which is greater than the required 53 scfm at peak flow.

- Disinfection is not proposed for this system because it utilizes ultrafiltration. The BioMicrobics system has been tested by National Science Foundation (NSF) and found to have an overall fecal coliform from 1.0 cfu/100 mL to 1.6 cfu/100 mL. In test done under the NSF Standard 350, the BioBarrier had a geometric average E. Coli of 1.3 MPN/100 mL.
- There will be audiovisual alarms on the septic tanks and pumps to notify the homeowners that service is needed.

## **6. OPERATING PERMIT**

Operating permit MO-0138851 was successfully public noticed from June 15 to July 16, 2018 with no comments received. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit be issued.

Leasue Meyers, EI  
Engineering Section  
[leasue.meyers@dnr.mo.gov](mailto:leasue.meyers@dnr.mo.gov)



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

RECEIVED

OCT 30 2017

CP0001948 MO-0138851

AP28420

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED 1000	CHECK NO. 1012
DATE RECEIVED 10/30/17	

**APPLICATION OVERVIEW**

**Water Protection Program**

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: \_\_\_\_\_ **Pending Approval, Submitted**
- 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**

Malibu Pointe Estates WWTP

**2.2 PROJECT DESCRIPTION**

Wastewater plant to serve six 4-bedroom homes.

**2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION**

By contract hauler

**2.4 DESIGN INFORMATION**

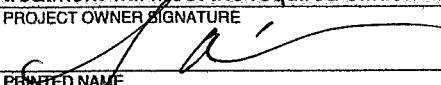
- A. Current population: 0; Design population: 22.2
- B. Actual Flow: 0 gpd; Design Average Flow: 2220 gpd;  
Actual Peak Daily Flow: 0 gpd; Design Maximum Daily Flow: 2220 gpd;  
Design Wet Weather Event: 2220

**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**

\$ 75,000.00

<b>3.0 WASTEWATER TREATMENT FACILITY</b>				
NAME Malibu Pointe Estates WWTP		TELEPHONE NUMBER WITH AREA CODE (816) 985-4040		EMAIL ADDRESS sullys@me.com
ADDRESS (PHYSICAL) Damsel Rd., Lake Ozark, MO 65049	CITY Lake Ozark	STATE MO	ZIP CODE 65079	COUNTY Camden
Wastewater Treatment Facility: Mo- (Outfall Of )				
3.1 Legal Description: 1/4, 1/4, 1/4, Sec. , T , R (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): 38.2 Northing (Y):-92.7 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: Lake of the Ozark				
<b>4.0 PROJECT OWNER</b>				
NAME O'Sullivan Development, INC		TELEPHONE NUMBER WITH AREA CODE (816) 985-4040		EMAIL ADDRESS sullys@me.com
ADDRESS 30 Breeana Bay	CITY Lake Ozark	STATE MO	ZIP CODE 65049	
<b>5.0 CONTINUING AUTHORITY:</b> Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.				
NAME Malibu Estates HOA		TELEPHONE NUMBER WITH AREA CODE (816) 985-4040		EMAIL ADDRESS sullys@me.com
ADDRESS 30 Breeana Bay	CITY Lake Ozark	STATE MO	ZIP CODE 65049	
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				
<b>6.0 ENGINEER</b>				
ENGINEER NAME / COMPANY NAME Matthew J. Marschke, P.E.		TELEPHONE NUMBER WITH AREA CODE (573) 216-0066		EMAIL ADDRESS matt.m@mwec.us
ADDRESS 5610 Alona Point	CITY Osage Beach	STATE Osage Bea	ZIP CODE 65065	
<b>7.0 PROJECT OWNER:</b> 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 				
PRINTED NAME Sean O'Sullivan			DATE 10/23/17	
TITLE OR CORPORATE POSITION Owner		TELEPHONE NUMBER WITH AREA CODE (816) 985-4040		EMAIL ADDRESS sullys@me.com
Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM P.O. BOX 176 JEFFERSON CITY, MO 65102-0176				
<b>END OF PART A.</b>				
<b>REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.</b>				