

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



**CONSTRUCTION PERMIT**

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

Brian Smith  
Shores of Eagles View HOA  
PO Box 24206  
Blue Springs, MO 64013

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.

March 16, 2022  
Effective Date

March 15, 2024  
Expiration Date

  
Chris Wieberg, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

A Membrane Bioreactor (MBR) Wastewater Treatment Facility (WWTF) will be constructed to treat domestic wastewater for a new residential subdivision. The new facility will be sized for a design average flow of 9,200 gpd and population equivalent of 122 PE. Each residence will have its own septic tank and sewage pump that will convey wastewater via forcemains to a common two compartment treatment tank that contains the MBR in the second compartment. After secondary treatment, the MBR effluent travels through a sampling port with a weir to discharge into the Lake of the Ozarks.

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 consistent with plans and specifications sealed, signed, and dated by James Jackson, Jr., P.E. with Lake Professional Engineering Services, Inc. and as described in this permit.

3. The Department must be contacted in writing prior to making any changes to the 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(11).
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 Central Field Operations Regional Office per 10 CSR 20-7.015(9)(G).
5. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment per 10 CSR 20-8.140(2)(C)2.
6. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.
7. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation per 10 CSR 20-8.140(2)(B). The minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300') per 10 CSR 20-8.140(2)(C)1.
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](https://dnr.mo.gov/env/wpp/epermit/help.htm). See <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/stormwater> for more information.
9. A United States Army Corps of Engineers (USACE) Clean Water Act Section 404 Department of the Army permit and a Section 401 Water Quality Certification issued by the Department may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied or notification is provided that no Section 404 permit is required by the USACE. You must contact your local USACE district since they determine what waters are jurisdictional and which permitting requirements may apply. You may call the Department's Water Protection Program, Operating Permits Section at 573-522-4502 for more information. See <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality> for more information.
10. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.
  - Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and

mechanical equipment shall be protected from physical damage by not less than the one hundred (100)-year flood elevation. 10 CSR 20-8.140(2)(B). 10 CSR 20-8.130(2)(A)

- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140(2)(D). 10 CSR 20-8.130(2)(B)
- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility: 10 CSR 20-8.130(2)(C)
  - Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140(8)(A)
  - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140(8)(B)
  - First aid equipment; 10 CSR 20-8.140(8)(C)
  - Posted “No Smoking” signs in hazardous areas; 10 CSR 20-8.140(8)(D)
  - Appropriate personal protective equipment (PPE); 10 CSR 20-8.140(8)(E)
  - Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140(8)(F)
  - 10 CSR 20-8.140 (8) (G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
  - 10 CSR 20-8.140 (8) (H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
  - Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140(8)(I)
  - Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate.; 10 CSR 20-8.140(8)(K)
  - Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140(8)(L)
  - Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140(8)(M)
- Force main system shall be designed to withstand all pressures (including water hammer and associated cyclic reversal of stresses), and maintain a velocity of at least two feet (2') per second. 10 CSR 20-8.130(8)(A)
- No treatment unit with a capacity of twenty-two thousand five hundred gallons per day (22,500 gpd) or less shall be located closer than the minimum distance of 200' to a neighboring residence and 50' to property line for lagoons; 200' to a neighboring residence for open recirculating media filters following primary treatment; and 50' to a

neighboring residence for all other discharging facilities. See 10 CSR 20-2.010(68) for the definition of a residence. 10 CSR 20-8.140(2)(C)2.

- The outfall shall be so constructed and protected against the effects of flood water, ice, or other hazards as to reasonably ensure its structural stability and freedom from stoppage. 10 CSR 20-8.140(6)(A)
- All sampling points shall be designed so that a representative and discrete twenty-four (24) hour automatic composite sample or grab sample of the effluent discharge can be obtained at a point after the final treatment process and before discharge to or mixing with the receiving waters. 10 CSR 20-8.140(6)(B)
- All outfalls shall be posted with a permanent sign indicating the outfall number (i.e., Outfall #001). 10 CSR 20-8.140(6)(C)
- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140(7)(A)1.
- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140(7)(C)
- A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140(7)(E)
- Effluent twenty-four (24) hour composite automatic sampling equipment shall be provided at all mechanical wastewater treatment facilities and at other facilities where necessary under provisions of the operating permit. 10 CSR 20-8.140(7)(F)
- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility:
  - Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140(8)(A)
  - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140(8)(B)
  - First aid equipment; 10 CSR 20-8.140(8)(C)
  - Posted “No Smoking” signs in hazardous areas; 10 CSR 20-8.140(8)(D)
  - Appropriate personal protective equipment (PPE); 10 CSR 20-8.140(8)(E)
  - Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140(8)(F)
  - 10 CSR 20-8.140(8)(G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
  - 10 CSR 20-8.140(8)(H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;

- Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140(8)(I)
- Ventilation shall include the following:
  - Isolate all pumping stations and wastewater treatment components installed in a building where other equipment or offices are located from the rest of the building by an air-tight partition, provide separate outside entrances, and provide separate and independent fresh air supply; 10 CSR 20-8.140(8)(J)1.
  - Force fresh air into enclosed screening device areas or open pits more than four feet (4') deep. 10 CSR 20-8.140(8)(J)2.
  - Dampers are not to be used on exhaust or fresh air ducts. Avoid the use of fine screens or other obstructions on exhaust or fresh air ducts to prevent clogging; 10 CSR 20-8.140(8)(J)3.
  - Where continuous ventilation is needed (e.g., housed facilities), provide at least twelve (12) complete air changes per hour. Where continuous ventilation would cause excessive heat loss, provide intermittent ventilation of at least thirty (30) complete air changes per hour when facility personnel enter the area. Base air change demands on one hundred percent (100%) fresh air; 10 CSR 20-8.140(8)(J)4.
  - Electrical controls. Mark and conveniently locate switches for operation of ventilation equipment outside of the wet well or building. Interconnect all intermittently operated ventilation equipment with the respective wet well, dry well, or building lighting system. The manual lighting/ventilation switch is expected to override the automatic controls. For a two (2) speed ventilation system with automatic switch over where gas detection equipment is installed, increase the ventilation rate automatically in response to the detection of hazardous concentrations of gases or vapors; 10 CSR 20-8.140(8)(J)5.
  - Fabricate the fan wheel from non-sparking material. Provide automatic heating and dehumidification equipment in all dry wells and buildings. 10 CSR 20-8.140(8)(J)6.
- Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate. 10 CSR 20-8.140(8)(K)
- Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140(8)(L)
- Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140(8)(M)
- All wastewater treatment facilities must have a screening device, comminutor, or septic tank for the purpose of removing debris and nuisance materials from the influent wastewater. 10 CSR 20-8.150(2)

- Grease interceptors shall be provided on kitchen drain lines from institutions, hospitals, hotels, restaurants, schools, bars, cafeterias, clubs, and other establishments from which relatively large amounts of grease may be discharged to a wastewater treatment facility owned by the grease producing entity. Grease interceptors are typically constructed from fiberglass reinforced polyester, high density polyethylene (HDPE), or concrete. For corrugated HDPE grease interceptors, follow ASTM F2649 – 14 *Standard Specification for Corrugated High Density Polyethylene (HDPE) Grease Interceptor Tanks*, as approved and published September 1, 2014. For precast concrete grease interceptor tanks, follow ASTM C1613 – 17 *Standard Specification for Precast Concrete Grease Interceptor Tanks*, as approved and published September 1, 2017. 10 CSR 20-8.150(3)
- A septic tank must have a minimum capacity of at least one thousand (1,000) gallons. 10 CSR 20-8.180(2)(A)
- The septic tank shall be baffled. 10 CSR 20-8.180(2)(B)
- For wastewater treatment plants with a flow equal to or greater than one hundred thousand gallons per day (100,000 gpd), the MBR process must be designed with a minimum of two (2) membrane trains capable of treating the daily average flow with one (1) membrane cassette out of service; 10 CSR 20-8.180(7)(A)1.
- Membrane Bioreactor design flux criteria must be satisfied with one (1) membrane module out-of-service (e.g., for external clean in place, recovery cleaning, repair). For purposes of these criteria, a membrane module is the smallest membrane unit capable of separate removal from the tank while maintaining operation of other membrane units in the same tank. 10 CSR 20-8.180(7)(A)2.
- Membranes placed in the aeration basin(s) rather than a separate membrane tank shall have—
  - Individual modules and individual diffusers that can be removed separately for maintenance and repair; 10 CSR 20-8.180(7)(A)3.A. and
  - Aeration basin(s) volume sized for complete nitrification; 10 CSR 20-8.180(7)(A)3.B.
- Membrane Bioreactor preliminary treatment systems shall be consistent with the membrane manufacturer recommendations; 10 CSR 20-8.180(7)(B)1.
- Grit removal facilities are required for wastewater treatment facilities that utilize membrane bioreactors for secondary treatment. 10 CSR 20-8.150(6) and 10 CSR 20-8.180(7)(B)2.
- Membrane Bioreactors shall provide oil and grease removal when the levels in the influent may cause damage to the membranes; 10 CSR 20-8.180(7)(B)3.
- Membrane Bioreactors shall provide a fine screen and high water alarm, designed to treat peak hourly flow. Coarse screens followed by fine screens may be used in larger facilities to minimize the complications of fine screening; and 10 CSR 20-8.180(7)(B)4.



- Membrane Bioreactor preliminary treatment shall comply with 10 CSR 20-8.150(4)(B) for reliability. 10 CSR 20-8.180(7)(B)5.
- The Membrane Bioreactor's aeration blowers must provide adequate air for membrane scour and process demands. 10 CSR 20-8.180(7)(C)
- Redundancy. The Membrane Bioreactor shall have at least one (1) of the following:
  - The ability to run in full programmable logic control (PLC) or standby power mode in case of an automatic control failure; 10 CSR 20-8.180(7)(D)1.
  - An operational battery backup PLC if manual control is not possible; or 10 CSR 20-8.180(7)(D)2.
  - Sufficient standby power generating capabilities to provide continuous flow through the membranes during a power outage (e.g., preliminary screening, process aeration, recycle/RAS/permeate pumps, air scour, vacuum pumps) or an adequate method to handle flow for an indefinite period (e.g., private control of influent combined with contingency methods). 10 CSR 20-8.180 (7)(D)3.
- Operations and Maintenance. The MBR design shall—
  - Include provisions to monitor membrane integrity; 10 CSR 20-8.180(7)(E)1.
  - Provide on-line continuous turbidity monitoring of filtrate or an equivalent for operational control and indirect membrane integrity monitoring for a treatment plant with design average flow greater than or equal to one hundred thousand gallons per day (100,000 gpd); 10 CSR 20-8.180(7)(E)2. and
  - Include provisions to remove membrane cassette for cleaning considering the membrane cassette wet weight plus additional weight of the solids accumulated on the membranes. 10 CSR 20-8.180(7)(E)3.

11. Upon completion of construction:

- A. The Shores of Eagles View HOA will become the continuing authority for operation and maintenance of these facilities;
- B. Submit an electronic copy of the as built if the project was not constructed in accordance with previously submitted plans and specifications; and
- C. Submit the enclosed form, MO 780-2155, Wastewater Construction Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N). Identify that the application is for a General permit for the discharge of domestic wastewater, MO-GD00604.
- D. Submit the Operating Permit Application Fee of \$300 to the Department at least 60 days prior to operation.

Form MO 780-1512, Form B - Application for Operating Permit for Facilities that Receive Primarily Domestic Waste and Have a Design Flow Less than or Equal to 100,000 gallons per day has already been submitted to the Department.



## **IV. REVIEW SUMMARY**

### **1. CONSTRUCTION PURPOSE**

The new membrane bioreactor wastewater treatment facility will be constructed to treat domestic wastewater generated from a 32 lot residential subdivision. The WWTF will be sized for a design average flow of 9,200 gpd and a population equivalent of 122 PE.

### **2. FACILITY DESCRIPTION**

The new wastewater treatment system is being constructed to serve a new residential subdivision. The new treatment system will be constructed with septic tanks and sewage pumps for each residence that convey wastewater via forcemains to a two compartment treatment tank that contains the MBR in the second compartment. After secondary treatment, the MBR effluent travels through a sampling port with a weir to discharge into the Lake of the Ozarks.

The Shores of Eagles View WWTF is located at Adrian Lane, Climax Springs, in Camden County, Missouri. The facility has a design average flow of 9,200 gpd and serves a hydraulic population equivalent of approximately 122 people.

### **3. COMPLIANCE PARAMETERS**

The proposed facility is required to meet the requirements of Table E-1 of MOGD00000, with an expiration date of June 30, 2024. The facility will be required to meet Total Phosphorus of 0.5 mg/L as monthly average effluent limit and Total Ammonia as Nitrogen- Summer monthly average effluent limit of 1.4 mg/L.

The limits following the completion of construction will be applicable to the facility:

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MONITORING FREQUENCY
Flow	MGD	*		*	Once/Quarter
Biochemical Oxygen Demand <sub>5</sub>	mg/L		15	10	Once/Quarter
Total Suspended Solids	mg/L		20	15	Once/Quarter
Ammonia as N-summer	mg/L	3.6		1.4	Once/Quarter
Ammonia as N-winter	mg/L	7.5		2.9	Once/Quarter
Total Phosphorus	mg/L	*		0.5	Once/Quarter
<i>E. coli</i> **	#/100mL	630		126	Once/Quarter
PARAMETER	UNITS	MINIMUM		MAXIMUM	MONITORING FREQUENCY
pH	SU	6.5		9.0	Once/Quarter

\* Monitoring Frequency

\*\* Facilities discharging within two miles of waters designated as Whole Body Contact – A (WBC-A) shall be limited to 630 #/100 mL as a daily maximum and 126 #/100mL as a monthly average [10 CSR 20-7.031(5)(C)]. Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. Facilities undergoing the Department's Alternatives Analysis (Table E or F) shall meet the requirements for WBC-A for all discharges except for those to losing streams (See Note 3). **Limit Set Designator: WA**

#### **4. ANTIDegradation**

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated October 2021, due to the construction of a new discharging facility. See **APPENDIX – ANTIDegradation**.

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

**Construction will cover the following items:**

- Components are designed for a Population Equivalent of 122 based on organic loading to the system.
- Residential Septic Tanks – 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 by gravity to the 1,000 gallon single-compartment septic tank. The septic tanks provide approximately 3.6 days of detention at design average flow. One screened simplex ORENCO P100511 pump capable of 10 gpm at 93 ft of TDH is located in the septic tanks. When the water level reaches a height of 58 inches from the bottom, the pump will turn on and when the water level reaches a height of 55 inches the pump will turn off. The pumped wastewater shall discharge to the Membrane Bioreactor via a low pressure collection system. Settled solids in the septic tanks shall be removed by a contract hauler.
- Low Pressure Collection System – Various branches of a low pressure sewer will be constructed to convey wastewater from the Septic Tanks to the Membrane Bioreactor. Low pressure sewers will be constructed with 1.5 inch to 2 inch SDR21 PVC forcemains.
- Membrane Bioreactor (MBR) — The MBR system is a BioBarrier HSMBR 9.0 MBR System by Biomicrobics. The system will be a single 18,000 gallon MBR system.
  - 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 4.56 gallons/ft<sup>2</sup>/day (7.74 lmh) at peak flow with a maximum operating flux of 8.84 gallons/ft<sup>2</sup>/day (15 lmh).
  - The surface area of the membranes is 168 m<sup>2</sup>
  - The filtration rate through the membranes is 11.1 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 180 scfm which is greater than the required 96.1 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.

- V-notch Weir Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis. A v-notch weir with a 90 degree notch. This measurement device does not include flow totalizing or recording.

## **6. OPERATING PERMIT**

After completion of construction project submit:

- Form MO 780-2155, Wastewater Construction Statement of Work Completed, <https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155>, and
- As-builts if the project was not constructed in accordance with previously submitted plans and specifications.
- Operating Permit Application Fee of \$300 to the Department at least 60 days prior to operation.

Missouri State Operating Permit, General Permit MO-GD00604, will be issued after receipt of the above documents.

## **V. NOTICE OF RIGHT TO APPEAL**

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

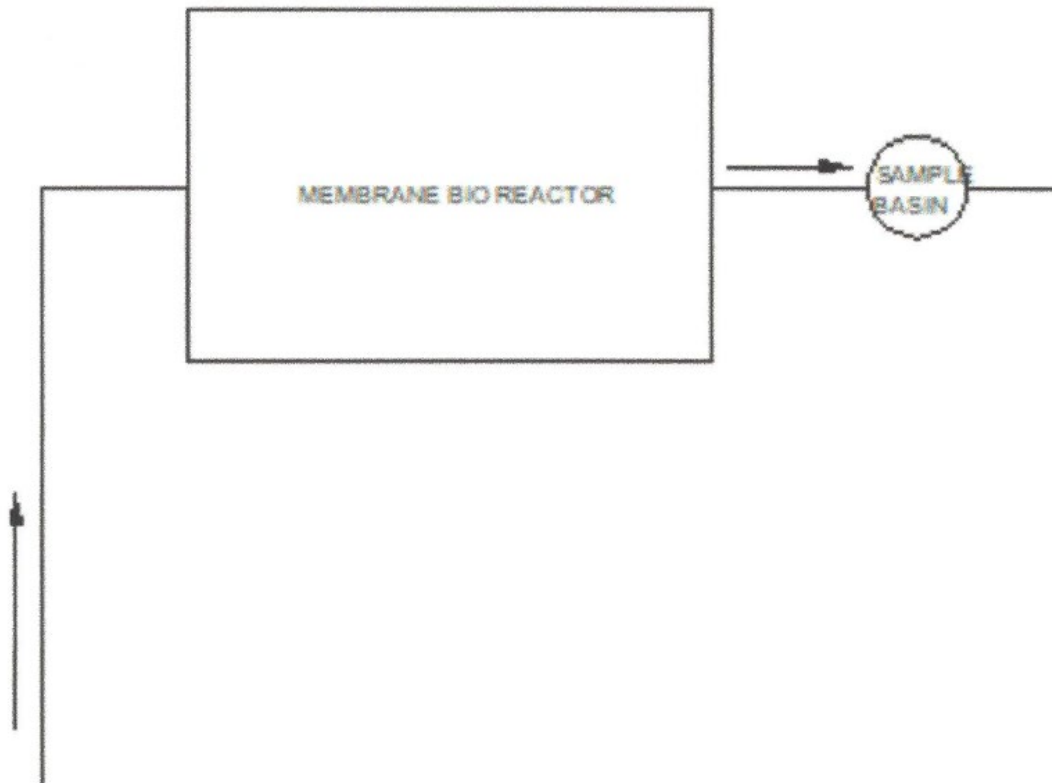
Administrative Hearing Commission  
U.S. Post Office Building, Third Floor  
131 West High Street, P.O. Box 1557  
Jefferson City, MO 65102-1557  
Phone: 573-751-2422  
Fax: 573-751-5018  
Website: <https://ahc.mo.gov>

Steve Hamm, P.E.  
Engineering Section  
[Steven.hamm@dnr.mo.gov](mailto:Steven.hamm@dnr.mo.gov)

- **Appendix A: Process Flow Diagram**
- **Appendix B: Antidegradation**

## **Appendix A: Process Flow Diagram**

Flow Chart



**Appendix B: Antidegradation**

**Missouri Department of Natural Resources  
Water Protection Program  
Water Pollution Control Branch  
Engineering Section**

**Water Quality and Antidegradation Review**

**Department's Alternatives Analysis for  
Domestic Wastewater Facilities with Design Flow  
Less Than 50,000 Gallons per Day**

*For Protection of Water Quality  
and Determination of Effluent Limits at*

*Shores of Eagles View WWTF*

October, 2021



## 1. WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (Department) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review that documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, and revised July 13, 2016, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

## 2. APPLICABILITY

This Water Quality and Antidegradation Review is for facilities that produce primarily domestic wastewater and discharge less than 50,000 gallons per day. This General Antidegradation Review is not applicable to facilities where the receiving waterbody, or downstream waterbodies, have a Total Maximum Daily Load (TMDL) or are 303(d) or 305(b) listed for the pollutants of concern (POCs) addressed in this alternatives analysis, with an exception for waterbodies that are listed for *E. coli* since disinfection will be required. For receiving waters that are impaired for pollutants other than *E. coli*, the Antidegradation Implementation Procedure requires a Tier 1 approach and the applicant must demonstrate that the discharge will not "cause or contribute" to the impairment. For these site-specific mixed tier reviews (where some POCs are Tier 1 and others are Tier 2) applicants may use the alternative analysis presented in this document for the Tier 2 pollutants.

Facilities that are currently under enforcement will need to coordinate with the Water Protection Program's compliance and enforcement section to determine applicability for the Department's Alternatives Analysis. No mixing will be included in this review for receiving waterbodies. If the applicant would like to have effluent limitation derivation include mixing considerations, a site-specific alternatives analysis will need to be completed.

## 3. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge for a domestic wastewater treatment facility. Pollutants of concern are defined as those pollutants "proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge" (AIP, Page 7). No existing water quality data is required because all POCs were considered to be Tier 2 and significantly degrading in the absence of existing water quality. Assumed uses for the receiving waterbody are General Criteria, Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Irrigation (IRR), and Livestock & Wildlife Protection (LWP). If any Tier 1 Pollutants of Concern not addressed in this alternatives analysis will be discharged, the applicant must submit the *Path D: Tier 1 Preliminary Review Request form* for those pollutants.

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT****
Biochemical Oxygen Demand (BOD <sub>5</sub> )/DO	2	Significant	
Total Suspended Solids (TSS)	**	Significant	
Ammonia	2	Significant	
pH	***	Significant	Permit limits applied
<i>Escherichia coli</i> ( <i>E. coli</i> )	2	Significant	
Total Phosphorus (TP)	2	Significant	

\* Tier assumed.

\*\* Tier determination not possible: No in-stream standard for this parameter.

\*\*\* The standard for this parameter is a range.

\*\*\*\* Permit limits for other parameters including Oil & Grease, Total Residual Chlorine, and Nitrates will be applied based on water quality standards and criteria as applicable.

Total Residual Chlorine (TRC) effluent limits of 0.017 mg/L daily maximum, 0.008 mg/L monthly average are recommended if chlorine is used as a disinfectant. Standard compliance language for TRC, including the minimum level (ML), may be included in the operating permit.

#### **4. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE**

Missouri's Antidegradation Implementation Procedures (AIP) specify that if the proposed activity results in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. The applicant must submit the Antidegradation Review Submittal: Voluntary Tier 2 – Significant Degradation for Domestic Wastewater Facilities with Design Flow Less Than 50,000 Gallons per Day form. This analysis will serve as the applicant's alternatives analysis to fulfill the requirements of the AIP.

A Geohydrologic Evaluation must be submitted with the Antidegradation Review Request.

A Missouri Department of Conservation Natural Heritage Review Report must be obtained by the applicant. The applicant should review the Natural Heritage Review and contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination if necessary.

##### **4.1. NO DISCHARGE EVALUATION**

According to 10 CSR 20-6.010(4)(A)5.B., facility plans must include an evaluation of the feasibility of constructing and operating a facility with no discharge to waters of the state if the report is for a new or modified wastewater treatment facility. Per the Antidegradation Implementation Procedure Section II.B.1, for discharges likely to cause significant degradation, applicants must provide an analysis of non-degrading alternatives. No-discharge alternatives may include surface land application, subsurface land application, and connection to a regional treatment facility.

The applicant must submit the *Antidegradation: Regionalization and No-Discharge Evaluation* form to demonstrate that a no-discharge facility is not feasible for this site. If the information provided on the form is not sufficient to demonstrate that a no-discharge facility is not feasible, a more detailed evaluation of no discharge options will be required before the Department can complete its determination.

##### **4.2. DEMONSTRATION OF NECESSITY**

The Department has used available data to complete an alternatives analysis of previously evaluated treatment technologies and expected performance. Data from fifty-four Water Quality and Antidegradation Reviews (WQARs) completed between March 2011 and April 2018 was evaluated and results are presented in Figure 1, Figure 2, and Table 2 below.

The data include eleven facilities designed to provide a high level of treatment to meet more stringent potential future ammonia as N effluent limits based on the 2013 EPA Ammonia criteria for the protection of mussels and gill-breathing snails. The data available to date indicates that the cost of facilities of this size range designed to meet these more stringent ammonia criteria is not substantively higher than other facilities designed to meet the current ammonia criteria.

The data include sixteen facilities designed to meet BOD and TSS effluent limits of 10 mg/L monthly average and 15 mg/L daily maximum or weekly average. The data available to date indicates that the cost of facilities designed to meet BOD and TSS effluent limits of 10 mg/L monthly average and 15 mg/L daily maximum or weekly average is not substantively higher than other facilities of this size range designed to meet less stringent BOD and TSS effluent limits.



The data include 28 facilities that will discharge to lakes. Of those facilities, 12 received ammonia limits in line with water quality based effluent limits for discharges to streams without mixing of around 3.7 mg/L summer daily maximum, 1.4 mg/L summer monthly average and 7.5 mg/L winter daily max, 2.9 mg/L winter monthly average. Two of the lake-discharging facilities received more stringent ammonia limits of 1.7 mg/L daily maximum, 0.6 mg/L monthly average; and one received ammonia limits of 1.7 mg/L summer daily maximum, 0.6 mg/L summer monthly average and 5.6 mg/L winter daily max, 2.1 mg/L winter monthly average. The data available indicate that the cost for facilities designed to meet ammonia limits in line with water quality based effluent limits for streams without mixing (3.7/1.4, 7.5/2.9) is not higher than other facilities of this size range designed to meet less stringent ammonia limits. These limits are more protective than existing water quality based effluent limits for discharges to lakes where the acute criteria is used to determine the baseline (12.1 mg/L daily maximum, 4.6 mg/L monthly average).

Facilities that were designed to meet limits based on the 2013 EPA ammonia criteria included a membrane bioreactor, extended aeration package plant, recirculating textile filter, recirculating sand filter, recirculating sand filter with moving bed biofilm reactor, sequencing batch reactor, integrated fixed film activated sludge system, and a proprietary aeration system.

Membrane bioreactor (MBR) systems combine a suspended growth biological reactor with solids removal via filtration across a membrane. The membranes can be designed for and operated in small spaces and with high removal efficiency of contaminants such as nitrogen, phosphorus, bacteria, biochemical oxygen demand, and total suspended solids. Membrane filtration allows a higher biomass concentration to be maintained in the treatment tank, thereby allowing smaller bioreactors to be used for a smaller footprint. MBR systems provide operational flexibility with respect to flow rates, as well as the ability to readily add or subtract units as needed, but that flexibility has limits. Membranes typically require that the water surface be maintained above a minimum elevation so that the membranes remain wet during operation. Throughput limitations are dictated by the physical properties of the membrane, and the result is that peak design flows generally should be no more than 1.5 to 2 times the average design flow. If peak flows exceed that limit, additional membranes may be needed to process the peak flow, or equalization may need to be included in the design. MBR systems typically have higher capital and operating costs than conventional systems.

The extended aeration process is a modification of the activated sludge process that provides biological treatment for the removal of biodegradable organic wastes under aerobic conditions. Wastewater in the aeration tank is mixed and oxygen is provided to the microorganisms. The mixed liquor then flows to a clarifier or settling chamber where most microorganisms settle to the bottom of the clarifier and a portion are pumped back to the beginning of the plant. The clarified wastewater flows over a weir and into a collection channel before being disinfected and discharged. Extended aeration is often used in smaller prefabricated package-type plants where lower operating efficiency is offset by mechanical simplicity and minimized design costs. In comparison to traditional activated sludge, longer mixing time with aged sludge and light loading (low F:M) offers a stable biological ecosystem better adapted for effectively treating waste load fluctuations from variable occupancy situations. Although the process is stable and easier to operate, extended aeration systems may discharge higher effluent suspended solids than found under conventional loadings.

Moving Bed Biofilm reactor (MBBR) systems may be a single aerated reactor, or several in series, with a buoyant free-moving plastic biofilm carrier media. MBBR systems can be designed to be capable of meeting more stringent total nitrogen limits. They produce a significantly reduced solids loading to the liquid-solids separation unit, the biofilm improves process stability, they offer flexibility to meet specific treatment objectives, and they are well suited for retrofit into existing treatment systems. MBBR systems require a smaller tank volume than a conventional activated sludge system and therefore have a smaller footprint. Adequate mixing must be provided to ensure that free-floating media remains uniformly distributed and screens must be provided to retain the media within the reactors.

Integrated fixed film activated sludge (IFAS) systems add fixed or free-floating media to an activated sludge basin. The process gets its name from combining a conventional activated sludge process with a fixed film system. This treatment system is similar to an MBBR; however MBBR systems do not recycle sludge. IFAS systems are often installed as a retrofit solution to conventional activated sludge systems. They require a smaller tank volume than a conventional activated sludge system and therefore have a smaller footprint. The biofilm combines aerobic, anaerobic, and anoxic zones promoting better nitrification compared to conventional activated sludge systems and the biofilm improves process stability. Adequate mixing must be provided to ensure that free-floating media remains uniformly distributed and to slough biomass from the media. Higher dissolved oxygen concentrations may be required as compared to conventional activated sludge. Screens must be provided to retain the media within the reactors.

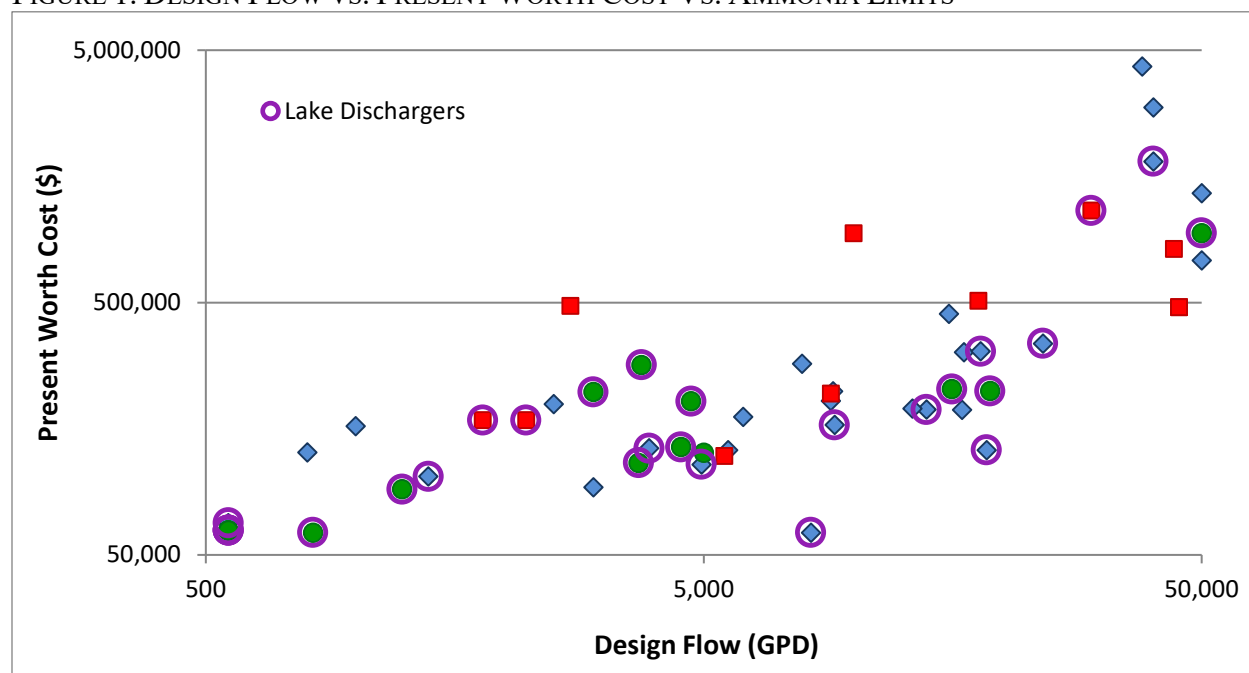
Recirculating sand filters (RSF) remove contaminants in wastewater through physical, chemical, and, most importantly, biological processes. The three common components are a pretreatment unit (generally a septic tank), a recirculation tank, and a sand filter. In the recirculation tank, raw effluent from the septic tank and the sand filter filtrate are mixed and pumped back to the sand filter bed. RSFs are effective in applications with high levels of BOD and can provide a good effluent quality with 85 - 95% removal of BOD and TSS. They can be designed to provide nitrification, but this requires increased surface area. Treatment is affected by extremely cold weather. Treatment capacity can be expanded through modular design. RSFs require routine maintenance, although the complexity of maintenance is generally minimal.

Recirculating textile filters systems are configured similar to an RSF except the filter media is an engineered fabric textile. They can be configured to provide nitrification, but this may require additional treatment units. They have a small operating footprint, are more aesthetically pleasing than some other treatment options, produce minimal noise, have the ability to handle variable flows, and have simple maintenance.

In addition to the treatment technologies listed above, all of which had previous WQARs that established advanced ammonia limits, there are other technology alternatives that can meet the advanced ammonia limits including conventional activated sludge, oxidation ditch, and lagoon retrofits. To obtain this level of performance, all technologies must be properly designed to accommodate nitrification and denitrification and they must be properly and actively operated.

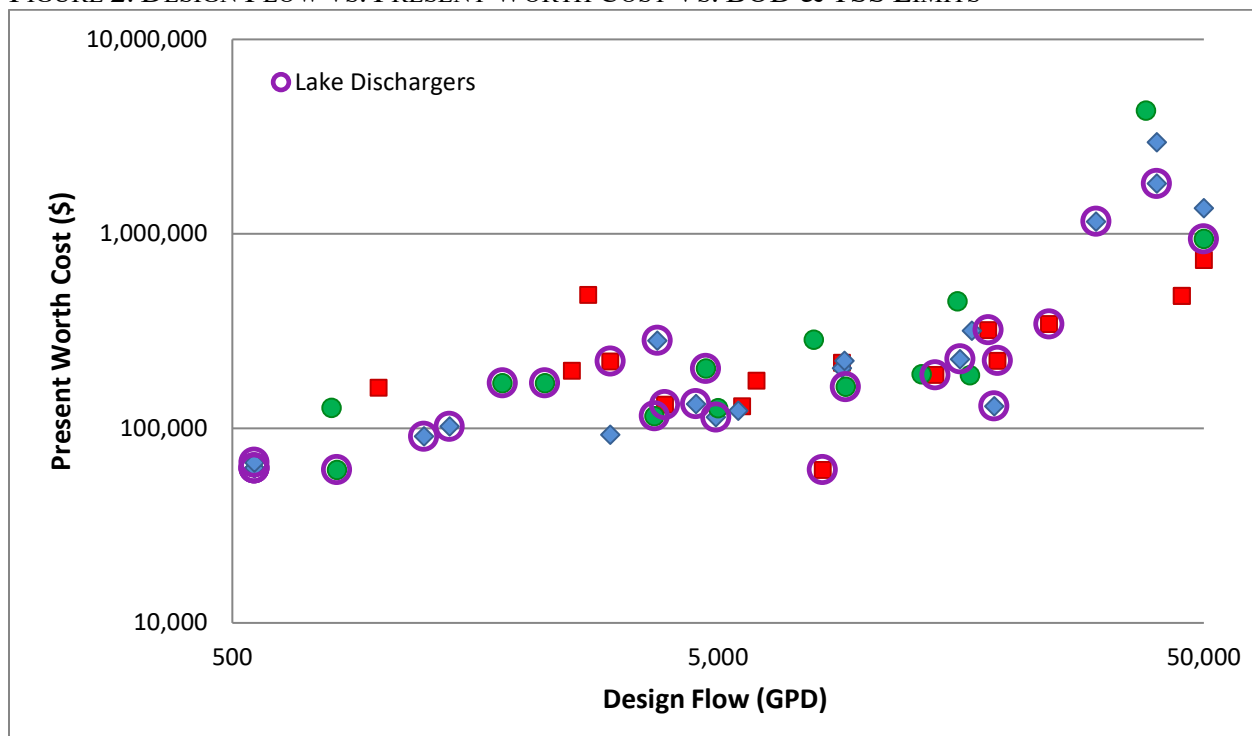
The above treatment system descriptions were adapted from EPA technology fact sheets and *Design of Municipal Wastewater Treatment Plants: WEF Manual of Practice No. 8 ASCE Manuals and Reports on Engineering Practice No. 76; Fifth Edition*, as well as other readily available sources and previous Water Quality and Antidegradation Reviews.

FIGURE 1. DESIGN FLOW VS. PRESENT WORTH COST VS. AMMONIA LIMITS



LEGEND		Summer Ammonia (mg/L)		Winter Ammonia (mg/L)	
		Daily Max	Monthly Avg.	Daily Max	Monthly Avg.
2013 EPA Criteria	■	≤1.7	≤0.6	≤5.6	≤2.1
Existing Aquatic Life Criteria (no mixing)	◆	approx. 3.7	approx. 1.4	approx. 7.5	approx. 2.9
Less Stringent (mixing)	●	>3.7	>1.4	>7.5	>2.9

FIGURE 2. DESIGN FLOW VS. PRESENT WORTH COST VS. BOD & TSS LIMITS



LEGEND	BOD (mg/L)		TSS (mg/L)	
	Daily Max	Monthly Avg.	Daily Max	Monthly Avg.
■	15	10	15	10
◆	15	10	>15	>10
●	>15	>10	>15	>10

TABLE 2. DESIGN FLOW VS. PRESENT WORTH COST

DATE	Design Flow (MGD)	Technology	BOD (mg/L)		TSS (mg/L)		Summer Ammonia (mg/L)		Winter Ammonia (mg/L)		Present Worth Cost (\$)	\$ PW/gpd
			Daily Max or Weekly Average	Monthly Average	Daily Max or Weekly Average	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Monthly Average		
4/16/2018	*0.000450	Recirculating Textile Filter	15	10	20	15	3.7	1.4	7.5	2.9	66,838	149
5/2/2012	*0.000555	Recirculating Textile Filter	15	10	20	15	12.1	4.6	12.1	4.6	62,506	113
4/2/2013	*0.000555	Recirculating Textile Filter	15	10	20	15	12.1	4.6	12.1	4.6	62,506	113
10/1/2014	*0.000555	Extended Aeration Package Plant	15	10	22.5	15	7.8	3	7.8	3	62,506	113
4/17/2017	*0.000555	Recirculating Textile Filter	15	10	20	15	3.7	1.4	7.5	2.9	66,838	120
4/4/2012	0.000800	Recirculating Textile Filter	30	15	30	15	4	1.5	7.7	2.9	127,427	159
12/1/2013	*0.000821	Membrane Bioreactor	30	20	30	20	12.1	4.6	12.1	4.6	61,240	75
9/2/2012	0.001000	Recirculating Textile Filter	15	10	15	10	3.7	1.4	7.5	2.9	162,007	162
7/6/2011	*0.001240	Recirculating Textile Filter	15	10	22	15	6	3	6	3	91,000	73
1/1/2015	*0.001400	Recirculating Textile Filter	15	10	23	15	3.7	1.4	7.6	2.9	102,174	73
9/8/2017	*0.001800	Recirculating Textile Filter	30	20	30	20	1.7	0.6	1.7	0.6	170,879	95
9/5/2017	*0.002200	Recirculating Textile Filter	30	20	30	20	1.7	0.6	1.7	0.6	170,879	78
5/5/2011	0.002500	Extended Aeration	15	10	15	10	3.7	1.4	7.5	2.9	198,000	79
8/31/2017	0.002700	New Technology Primary Tank with Aeration	15	10	15	10	1.7	0.6	5.6	2.1	485,000	180
9/1/2011	*0.003000	Recirculating Textile Filter	15	10	15	10	12.1	4.6	12.1	4.6	220,915	74
3/1/2012	0.003000	Extended Aeration Package Plant	15	10	20	15	3.7	1.4	7.5	2.9	92,604	31
2/22/2016	*0.003700	Recirculating Rock Filter	30	20	30	20	7.3	2.8	7.3	2.8	115,688	31
7/4/2011	*0.003750	Recirculating Textile Filter	15	10	20	15	12.1	4.6	12.1	4.6	283,000	75
4/1/2014	*0.003885	Recirculating Sand Filter	15	10	15	10	3.7	1.4	7.5	2.9	132,185	34
12/1/2012	*0.004500	Recirculating Sand Filter	15	10	23	15	12.1	4.6	12.1	4.6	133,676	30
6/3/2013	*0.004718	Recirculating Sand Filter	30	20	30	20	12.1	4.6	12.1	4.6	203,060	43
11/2/2011	*0.004950	Recirculating Sand Filter	15	10	20	15	3.5	1.4	7.5	2.9	114,058	23
6/4/2011	0.005000	Moving Bed Biofilm Reactor	45	30	45	30	5.7	2.2	8.2	3.2	127,000	25
8/22/2017	0.005500	Recirculating Sand Filter	15	10	20	15	1.7	0.6	5.6	2.1	123,224	22
9/6/2012	0.005600	Extended Aeration with Filtration and Aerated Holding Tanks	15	10	15	10	3.7	1.4	7.5	2.9	130,000	23

DATE	Design Flow (MGD)	Technology	BOD (mg/L)		TSS (mg/L)		Summer Ammonia (mg/L)		Winter Ammonia (mg/L)		Present Worth Cost (\$)	\$ PW/gpd
			Daily Max or Weekly Average	Monthly Average	Daily Max or Weekly Average	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Monthly Average		
6/1/2011	0.006000	Recirculating Sand Filter	15	10	15	10	3.7	1.4	7.5	2.9	176,239	29
3/1/2011	0.007875	Modular Fixed Film Activated Sludge with Constructed Wetlands	30	20	30	20	3.7	1.4	7.5	2.9	285,780	36
4/3/2012	*0.008210	Membrane Bioreactor	15	10	15	10	2.6	1	2.6	1	61,240	7
8/5/2014	0.009000	Recirculating Sand Filter	15	10	20	15	3.1	1.2	7.5	2.9	203,698	23
1/1/2014	0.009000	Membrane Bioreactor	15	10	15	10	1.6	0.6	5.5	2.1	217,739	24
4/6/2012	0.009100	Membrane Bioreactor	15	10	20	15	3.7	1.4	7.5	2.9	222,160	24
3/7/2012	*0.009158	Recirculating Gravel filter	30	20	30	20	3.7	1.5	6.5	2.5	163,681	18
3/6/2017	0.010000	Extended aeration	33	22	33	22	1.7	0.6	5.6	2.1	941,800	94
6/1/2014	0.013125	Recirculating Sand Filter	45	30	45	30	3	1.1	6	2.3	189,985	14
8/4/2012	*0.014000	Extended Aeration	15	10	15	10	3.7	1.4	7.5	2.8	188,208	13
7/1/2014	0.015540	Recirculating Sand Filter	23	15	23	15	3.9	1.5	7.8	3	450,986	29
7/5/2011	*0.015750	Recirculating Sand Filter	15	10	20	15	7.8	2.5	7.8	2.5	226,969	14
2/27/2015	0.016500	Extended Aeration Package Plant	45	30	45	30	3.7	1.4	7.5	2.9	187,957	11
7/1/2012	0.016650	Extended Aeration	15	10	20	15	3.7	1.4	7.5	2.9	317,750	19
9/3/2014	0.017800	Extended Aeration Package Plant	45	30	45	30	1.4	0.6	2.9	2.1	507,618	29
5/11/2015	*0.018000	Recirculating Sand Filter, Polishing Reactor, Chemical Phosphorus Removal	15	10	15	10	3.7	1.4	6.5	2.1	320,318	18
7/3/2013	*0.018500	Recirculating Textile Filter with Chemical & Filter Phosphorus Removal	15	10	20	15	3.7	1.4	7.5	2.9	130,000	7
12/7/2017	*0.018800	Recirculating Sand Filter	15	10	15	10	6	2.3	6	2.3	222,901	12
2/27/2015	*0.024000	Recirculating Gravel Filter and Chemical Phosphorus Removal	15	10	15	10	3.7	1.4	6.5	2.1	343,816	14
9/1/2014	*0.030000	Recirculating Sand Filter and Moving Bed Biofilm Reactor with Chemical Phosphorus Removal	15	10	20	15	1.7	0.6	5.6	2.1	1,157,390	39
6/2/2012	0.038000	Aerated Lagoon with Recirculating Sand Filter	45	30	45	30	3.7	1.4	7.5	2.9	4,309,665	113

DATE	Design Flow (MGD)	Technology	BOD (mg/L)		TSS (mg/L)		Summer Ammonia (mg/L)		Winter Ammonia (mg/L)		Present Worth Cost (\$)	\$ PW/gpd
			Daily Max or Weekly Average	Monthly Average	Daily Max or Weekly Average	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Monthly Average		
2/3/2013	0.040000	Moving Bed Biofilm Reactor (can be operated as IFAS)	15	10	20	15	3.7	1.4	7.5	2.9	2,963,181	74
8/20/2015	*0.040000	Recirculating Sand Filter and Moving Bed Biofilm Reactor	15	10	20	15	3.7	1	5.6	2.1	1,812,000	45
12/1/2016	0.044000	Fixed Film Extended Aeration	30	20	45	30	1.7	0.6	5.6	2.1	816,367	19
6/4/2013	0.045000	Moving Bed Biofilm Reactor	15	10	15	10	1.7	0.6	5.6	2.1	479,344	11
3/9/2016	0.045000	Moving Bed Biofilm Reactor	15	10	15	10	1.7	0.6	5.6	2.1	479,344	11
6/4/2012	*0.050000	New Technology Package Plant	30	20	30	20	7.5	2.9	7.5	2.9	942,050	19
7/3/2011	0.050000	Extended Aeration Package Plant	15	10	20	15	3.7	1.4	7.5	2.9	1,357,506	27
8/3/2014	0.050000	Recirculating Sand Filter	15	10	15	10	3.7	1.4	7.5	2.9	733,723	15

\* Lake Dischargers



Additionally, the table of wastewater treatment technologies in the *Ammonia Criteria: New EPA Recommended Criteria* factsheet includes several technologies that have demonstrated capability in meeting ammonia effluent limits of less than 0.7 mg/L when designed appropriately.

The EPA has approved the nutrient water quality standards at 10 CSR 20-7.031. Numeric water quality standards for specific lakes are listed in Table N of 10 CSR 20-7.031. Nutrient standards at 10 CSR 20-7.031(5)(N) apply to all other lakes that are waters of the state and have an area of at least ten acres during normal pool conditions, with the exception of the lakes located in the Big River Floodplain ecoregion (see 10 CSR 20-7.031(5)(N)2.). Waters that are 303(d) listed for nutrients will need to complete a site-specific antidegradation review to determine appropriate limits.

The base case treatment option for total phosphorus to ensure that water quality standards will be protected is assumed to be conventional secondary treatment. Total phosphorus effluent levels from conventional secondary treatment typically range from 1 to 4 mg/L. Three less degrading options that were considered are chemical addition for precipitation and settling, biological nutrient removal (BNR), and enhanced nutrient removal (ENR). Chemical addition is a common practice for phosphorus removal and has been used for a number of years in Southwest Missouri for discharges to lakes that are subject to the 0.5 mg/L effluent limits required at 10 CSR 20-7.015. An effluent limit of 0.5 mg/L was therefore determined to be a reasonable and economically efficient treatment level for the Department's Alternatives Analysis. The cost to treat beyond this level may not be economically efficient for facilities with a design flow less than 50,000 gallons per day.

As a result of this alternatives analysis, the Department has determined that for a facility that discharges less than 50,000 gallons per day, depending on site-specific conditions, there are technologies available that may be economically efficient and practicable, and that are capable of meeting the effluent limitations in Table 3 or Table 4. If the facility owners do not believe that there is a treatment technology that is both economically efficient and practicable for their facility to meet the limits in Table 3 or Table 4, a site-specific alternatives analysis may be required.

#### **4.3. DESIGN FLOW DETERMINATION**

As part of the Department's alternatives analysis, facilities up to 50,000 gallons per day were evaluated. A design flow maximum of 50,000 gallons per day was chosen for applicability of this alternatives analysis for a variety of reasons. As facilities increase in size, site-specific factors may require a more site-specific alternatives analysis. For example, larger facilities are more likely to have wet weather flows that must be addressed and are more likely to need Whole Effluent Toxicity testing or nutrient monitoring. Larger facilities are also more likely to discharge a larger variety of pollutants of concern, which may not be addressed in this review. Larger facilities also benefit from an economy of scale; smaller facilities tend to have a higher cost per gallon of wastewater treated, which is distributed over fewer paying customers. Finally, as we are working with a limited amount of data, limiting the design flow applicability for the Department's alternatives analysis ensures a factor of safety in our review.

#### **4.4. REGIONALIZATION ALTERNATIVE**

Within Section II B 1. of the AIP, discussion of the potential for discharge to a regional wastewater collection system is mentioned. The applicant must provide justification for not pursuing regionalization on the *Regionalization and No-Discharge Evaluation* form. If the information provided on the form is not sufficient to demonstrate that a regionalization alternative is not feasible, a more detailed evaluation will be required before the Department can complete its determination.

The applicant needs to fully evaluate regionalization and consolidation options when deciding on ways to comply with existing and future regulatory requirements. This includes evaluating connecting or selling their utility to a larger public or private utility. With the rising costs of compliance and often-limited

resources available to smaller facilities, not owning and operating a small utility may be the most beneficial and cost-effective alternative for achieving consistent compliance.

#### **4.5. LOSING STREAM ALTERNATIVE DISCHARGE LOCATION**

Under 10 CSR 20-7.015(4)(A), *prior to discharging to a losing stream, alternatives such as relocating the discharge to a gaining stream, and connection to a regional wastewater treatment facility are to be evaluated and determined to be unacceptable for environmental and/or economic reasons.*

Information provided by the applicant on the *No Discharge Evaluation* form must include evaluation and justification for why the owner is not pursuing land application, or connection to a regional facility.

#### **4.6. SOCIAL AND ECONOMIC IMPORTANCE EVALUATION**

Missouri's antidegradation implementation procedures specify that if the proposed activity results in significant degradation then a determination of social and economic importance is required.

Information provided by the applicant in the *Antidegradation Review Submittal: Voluntary Tier 2 – Significant Degradation for Domestic Wastewater Facilities with Design Flow Less Than 50,000 Gallons per Day* form must include a detailed social and economic importance evaluation. If the information provided on the form is not sufficient to demonstrate important social and economic importance, then a more detailed evaluation will be required before the Department can complete its determination.

### **5. GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDEGRADATION REVIEW**

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(2) Continuing Authorities and 10 CSR 20-6.010(4)(A)5.B., evaluation of no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.

9. If the proposed treatment technology is not covered in 10 CSR 20-8 Minimum Design Standards, the treatment process may be considered a new technology. As a new technology, the permittee will need to work with the review engineer to ensure equipment is sized properly. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation. This Antidegradation Review is based on the information provided by the facility and is not a comprehensive review of the proposed treatment technology. If the review engineer determines the proposed technology will not consistently meet proposed effluent limits, the permittee will be required to revise their Antidegradation Report.

## 6. PERMIT LIMITS AND MONITORING INFORMATION

TABLE 3. EFFLUENT LIMITS – ALL OUTFALLS

PARAMETER		UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
FLOW		MGD	*		*	FSR	ONCE/QUARTER
BIOCHEMICAL OXYGEN DEMAND <sub>5</sub> **		MG/L		15	10	PEL	ONCE/QUARTER
TOTAL SUSPENDED SOLIDS **		MG/L		15	10	PEL	ONCE/QUARTER
PH		SU	6.5– 9.0		6.5 – 9.0	FSR	ONCE/QUARTER
AMMONIA AS N (APR 1 – SEPT 30)		MG/L	1.7		0.6	PEL	ONCE/QUARTER
AMMONIA AS N (OCT 1 – MAR 31)		MG/L	5.6		2.1	PEL	ONCE/QUARTER
TOTAL PHOSPHORUS (NOTE 2)		MG/L	*		0.5	PEL	ONCE/QUARTER
<i>ESCHERICHIA COLIFORM (E. COLI)</i>	WBC(A) AND WBC (B) (NOTE 3)	#/100ML	630***		126	FSR	ONCE/QUARTER
	LOSING STREAM (NOTE 4)	#/100ML	126***		*	FSR	ONCE/QUARTER

TABLE 4. EFFLUENT LIMITS – OUTFALLS TO LAKES

PARAMETER		UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
FLOW		MGD	*		*	FSR	ONCE/QUARTER
BIOCHEMICAL OXYGEN DEMAND <sub>5</sub> **		MG/L		15	10	PEL	ONCE/QUARTER
TOTAL SUSPENDED SOLIDS **		MG/L		20	15	PEL	ONCE/QUARTER
PH		SU	6.5– 9.0		6.5 – 9.0	FSR	ONCE/QUARTER
AMMONIA AS N (APR 1 – SEPT 30)		MG/L	3.6		1.4	PEL	ONCE/QUARTER
AMMONIA AS N (OCT 1 – MAR 31)		MG/L	7.5		2.9	PEL	ONCE/QUARTER
TOTAL PHOSPHORUS (NOTE 2)		MG/L	*		0.5	PEL	ONCE/QUARTER
<i>ESCHERICHIA COLIFORM (E. COLI)</i>		#/100ML	630***		126	FSR	ONCE/QUARTER

\* Monitoring requirements only.

\*\* Publicly owned treatment works will be required to meet a removal efficiency of 85% or more for BOD<sub>5</sub> and TSS. Influent BOD<sub>5</sub> and TSS data should be reported to ensure removal efficiency requirements are met.

\*\*\* Publicly owned treatment works will receive a weekly average *E. coli* limit and private facilities will receive a daily maximum *E. coli* limit.

NOTE 1 – Preferred Alternative Effluent Limit – PEL; or Federal/State Regulation – FSR. Water Quality-Based Effluent Limitation – WQBEL Also, please see the **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5**.

NOTE 2 – Total Phosphorus limits are only applicable to discharges to a lake or watershed of a lake that is a water of the state and has an area of at least ten acres during normal pool conditions

NOTE 3 - Effluent limitations and monitoring requirements for *E. coli* for WBC(A) and WBC(B) are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

NOTE 4 – Effluent limits and monitoring requirements for *E. coli* are applicable year round for designated losing streams. No more than 10% of samples over the course of a calendar year shall exceed the 126 #/100 mL daily maximum.

Permit limits or monitoring requirements for other applicable parameters, including Oil & Grease, Total Residual Chlorine, Dissolved Oxygen, Nitrates, Total Recoverable Aluminum, and Total Recoverable Iron, may be included in the operating permit based on water quality standards and criteria as applicable.

## 7. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

## 8. DERIVATION AND DISCUSSION OF LIMITS

Water quality-based – Using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration

C<sub>s</sub> = upstream concentration

Q<sub>s</sub> = upstream flow

C<sub>e</sub> = effluent concentration

Q<sub>e</sub> = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration).

Water quality-based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Note: Under 40 CFR 133.105, permitting authorities shall require more stringent limitations than equivalent to secondary treatment limitations for 1) existing facilities if the permitting authority determines that the 30-day average and 7-day average BOD<sub>5</sub> and TSS effluent values that could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average BOD<sub>5</sub> and TSS effluent values that could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

## 9. LIMIT DERIVATION

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD<sub>5</sub>).** BOD<sub>5</sub> limits of 10 mg/L monthly average and 15 mg/L average weekly were determined by the Department to be achievable and protective of beneficial uses and existing water quality.

As per the *DO Modeling & BOD Effluent Limit Development Administrative Guidance for the Purpose of Conducting Water Quality Assistance Reviews*, facilities less than 100,000 gallons per day, and proposing BOD treatment less than or equal to an average monthly of 10 mg/L and average weekly of 15 mg/L as demonstrated by performance specifications from a manufacturer or effluent sampling of an existing facility with the same treatment facility are exempt from the DO modeling requirement.

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Total Suspended Solids (TSS).**

**Table 3:** TSS limits of 10 mg/L monthly average and 15 mg/L average weekly were determined by the Department to be achievable and protective of beneficial uses and existing water quality. According to EPA, because TSS and BOD are closely correlated, we apply the same limits for TSS as BOD.

**Table 4:** For lake discharging facilities, TSS limits of 15 mg/L monthly average and 20 mg/L average weekly were determined by the Department to be achievable and protective of beneficial uses and existing water quality for discharges to lakes where mixing would apply. These limits are more protective than the TSS limitations designated at 10 CSR 20-7.015(3)(A)1.A. for lakes and reservoirs.

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **pH.** – 6.5-9.0 SU. Technology based effluent limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. No mixing zone is allowed when using the Department's Alternatives Analysis, therefore the water quality standard must be met at the outfall.
- **Total Ammonia Nitrogen for Table 3.** The Department has determined that the alternatives analysis-based technology limits of 0.6 mg/L monthly average and 1.7 mg/L daily maximum in summer, and 2.1 mg/L monthly average and 5.6 mg/L daily maximum in winter are achievable by some treatment technologies. Because these limits are more protective than the water quality-based limits calculated below for a stream with no mixing, the technology-based limits were used.

In choosing to use the Department's alternatives analysis, the facility is electing to build a treatment plant that provides a high level of treatment that meets potential future limits based on the 2013 EPA Ammonia criteria and will potentially reduce the need to upgrade in the near future. If the facility owners do not believe that there is a treatment technology that is both economically efficient and practicable for their facility to meet these limits, a site-specific alternatives analysis may be required.

**Water Quality-Based Effluent Limits (WQBEL):**

Early Life Stages Present Total Ammonia Nitrogen criteria apply

[10 CSR 20-7.031(5)(B)7.C. & Table B1 and Table B3]. Background total ammonia nitrogen = 0.01 mg/L

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: April 1 – September 30

$$C_e = (((Q_e + Q_s) * C) - (Q_s * C_s)) / Q_e$$

Chronic WLA:  $C_e = ((Q_e + 0.0)1.5 - (0.0 * 0.01)) / Q_e = 1.5 \text{ mg/L}$

Acute WLA:  $C_e = ((Q_e + 0.0)12.1 - (0.0 * 0.01)) / Q_e = 12.1 \text{ mg/L}$

LTA<sub>c</sub> = 1.5 mg/L (0.780) = **1.17 mg/L** [CV = 0.6, 99<sup>th</sup> Percentile, 30 day avg.]

LTA<sub>a</sub> = 12.1 mg/L (0.321) = 3.89 mg/L [CV = 0.6, 99<sup>th</sup> Percentile]

MDL = 1.17 mg/L (3.11) = 3.6 mg/L [CV = 0.6, 99<sup>th</sup> Percentile]

AML = 1.17 mg/L (1.19) = 1.4 mg/L [CV = 0.6, 95<sup>th</sup> Percentile, n = 30]

Winter: October 1 – March 31

Chronic WLA:  $C_e = ((Q_e + 0.0)3.1 - (0.0 * 0.01)) / Q_e = 3.1 \text{ mg/L}$

Acute WLA:  $C_e = ((Q_e + 0.0)12.1 - (0.0025 * 0.01)) / Q_e = 12.1 \text{ mg/L}$

LTA<sub>c</sub> = 3.1 mg/L (0.780) = **2.42 mg/L** [CV = 0.6, 99<sup>th</sup> Percentile, 30 day avg.]

LTA<sub>a</sub> = 12.1 mg/L (0.321) = 3.89 mg/L [CV = 0.6, 99<sup>th</sup> Percentile]

MDL = 2.42 mg/L (3.11) = 7.5 mg/L [CV = 0.6, 99<sup>th</sup> Percentile]

AML = 2.42 mg/L (1.19) = 2.9 mg/L [CV = 0.6, 95<sup>th</sup> Percentile, n = 30]

	Maximum Daily Limit (mg/l)		Average Monthly Limit (mg/l)	
	Summer	Winter	Summer	Winter
WQBEL	3.6	7.5	1.4	2.9
Alternatives Analysis Limits	1.7	5.6	0.6	2.1

- **Total Ammonia Nitrogen for Table 4.** The Department has determined that the alternatives analysis-based technology limits for lake discharging facilities of 3.6 mg/L summer daily maximum, 1.4 mg/L summer monthly average and 7.5 mg/L winter daily max, 2.9 mg/L winter monthly average are achievable by some treatment technologies. Because these proposed limits are more protective than the water quality-based limits calculated below for a lake with mixing where acute criteria would be applicable for determining the baseline limits, the alternatives analysis limits were used.

Water Quality-Based Effluent Limits (WQBEL):

Early Life Stages Present Total Ammonia Nitrogen criteria apply

[10 CSR 20-7.031(5)(B)7.C. Table B1 & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

$$C_e = (((Q_e + Q_s) * C) - (Q_s * C_s)) / Q_e$$

Acute WLA:  $C_e = ((Q_e + 0)12.1 - (0 * 0.01)) / Q_e$

$$C_e = 12.1 \text{ mg/L}$$



LTA<sub>a</sub> = 12.1 mg/L (0.321) = **3.88 mg/L** [CV = 0.6, 99<sup>th</sup> Percentile]  
MDL = 3.88 mg/L (3.11) = 12.1 mg/L [CV = 0.6, 99<sup>th</sup> Percentile]  
AML = 3.88 mg/L (1.19) = 4.6 mg/L [CV = 0.6, 95<sup>th</sup> Percentile, n = 30]

	Maximum Daily Limit (mg/l)		Average Monthly Limit (mg/l)	
	Summer	Winter	Summer	Winter
WQBEL	12.1	12.1	4.6	4.6
Alternatives Analysis Limits	3.6	7.5	1.4	2.9

- **Total Phosphorus.** Total Phosphorus limits are only applicable to discharges to a lake or watershed of a lake that is a water of the state and has an area of at least ten acres during normal pool conditions. Monthly average of 0.5 mg/L and monitoring only for daily maximum were determined by the Department to be achievable and an appropriate target for the discharge to not cause or contribute to an instream water quality standard excursion or impairment should future modeling by the department occur.
- **Escherichia coli (E. coli).** Limits will be applied based on the receiving stream designated use.

**Whole Body Contact:** Monthly average of 126 per 100 mL as a geometric mean and Daily Maximum or Weekly Average as a geometric mean of 630 per 100 mL during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation designated use of the receiving water body, as per 10 CSR 20-7.031(5)(C) and 10 CSR 20-7.015 (9)(B)1. An effluent limit for both monthly average and daily maximum or weekly average is required by 40 CFR 122.45(d). Publicly owned treatment works will receive weekly average limits, while non-publicly owned treatment works will receive daily maximum limits.

**Losing Stream:** Discharges to losing streams shall not exceed 126 per 100 mL as a Daily Maximum at any time, as per 10 CSR 20-7.031(5)(C). Monitoring only for a monthly average. No more than 10% of samples over the course of the calendar year shall exceed 126 #/100 mL daily maximum as per 10 CSR 20-7.015(9)(B)1.G.

Per the effluent regulations, the *E. coli* sampling/monitoring frequency for facilities less than 100,000 gallons per day shall be set to match the monitoring frequency of wastewater and sludge sampling program for the receiving water category in 7.015(1)(B)3. during the recreational season (April 1 – October 31), with compliance to be determined by calculating the geometric mean of all samples collected during the reporting period (samples collected during the calendar week for the weekly average, and samples collected during the calendar month for the monthly average). Please see GENERAL ASSUMPTIONS OF THE WQAR #7

- **Total Residual Chlorine (TRC).** These limits will apply to facilities that chlorinate. Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A1]. Background TRC = 0.0 µg/L.

$$C_e = (((Q_e + Q_s) * C) - (Q_s * C_s)) / Q_e$$

$$\text{Chronic WLA: } C_e = ((Q_e + 0.0)10 - (0.0 * 0.0)) / Q_e = 10 \mu\text{g/L}$$

$$\text{Acute WLA: } C_e = ((Q_e + 0.0)19 - (0.0 * 0.0)) / Q_e = 19 \mu\text{g/L}$$

$$\text{LTA}_c = 10 \mu\text{g/L} (0.527) = \mathbf{5.3 \mu\text{g/L}} \quad [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$\text{LTA}_a = 19 \mu\text{g/L} (0.321) = 6.1 \mu\text{g/L} \quad [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$\text{MDL} = \mathbf{5.3 \mu\text{g/L}} (3.11) = 16.5 \mu\text{g/L} \quad [\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$\text{AML} = \mathbf{5.3 \mu\text{g/L}} (1.55) = 8.2 \mu\text{g/L} \quad [\text{CV} = 0.6, 95^{\text{th}} \text{ Percentile, } n = 4]$$

Total Residual Chlorine effluent limits of 0.017 mg/L daily maximum, 0.008 mg/L monthly average are recommended if chlorine is used as a disinfectant. Standard compliance language for TRC, including the minimum level (ML), should be included in the permit.

- **Aluminum, Total Recoverable.** Monitoring only. The facility may use chemicals for phosphorous removal that contain aluminum. Monitoring may be included in the operating permit to determine if reasonable potential exists for this facility's discharge to exceed water quality standards for Aluminum (Total Recoverable).
- **Iron, Total Recoverable.** Monitoring only. This facility may use chemicals for phosphorous removal that contain iron. Monitoring may be included in the operating permit to determine if reasonable potential exists for this facility's discharge to exceed water quality standards for Iron (Total Recoverable).
- **Oil & Grease.** These limits will apply to publicly owned treatment works and may apply to other facilities as appropriate. Conventional pollutant, [10 CSR 20-7.031, Table A1]. Effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

Permit limits for any other applicable parameters may be included in the operating permit based on water quality standards and criteria as applicable.

## 10. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed new or expanded facility discharge is assumed to result in significant degradation of the receiving waterbody. The Department has used available data to complete a review of available treatment technologies and expected performance. As a result of this review, the Department has determined that, depending on site specific conditions, there may be technologies available which are economically efficient and practicable for a facility that are capable of meeting the effluent limits in Table 3 or Table 4. If the facility owners do not believe that there is a treatment technology that is both economically efficient and practicable for their facility to meet the limits in Table 3 or Table 4, a site specific WQAR may be requested.

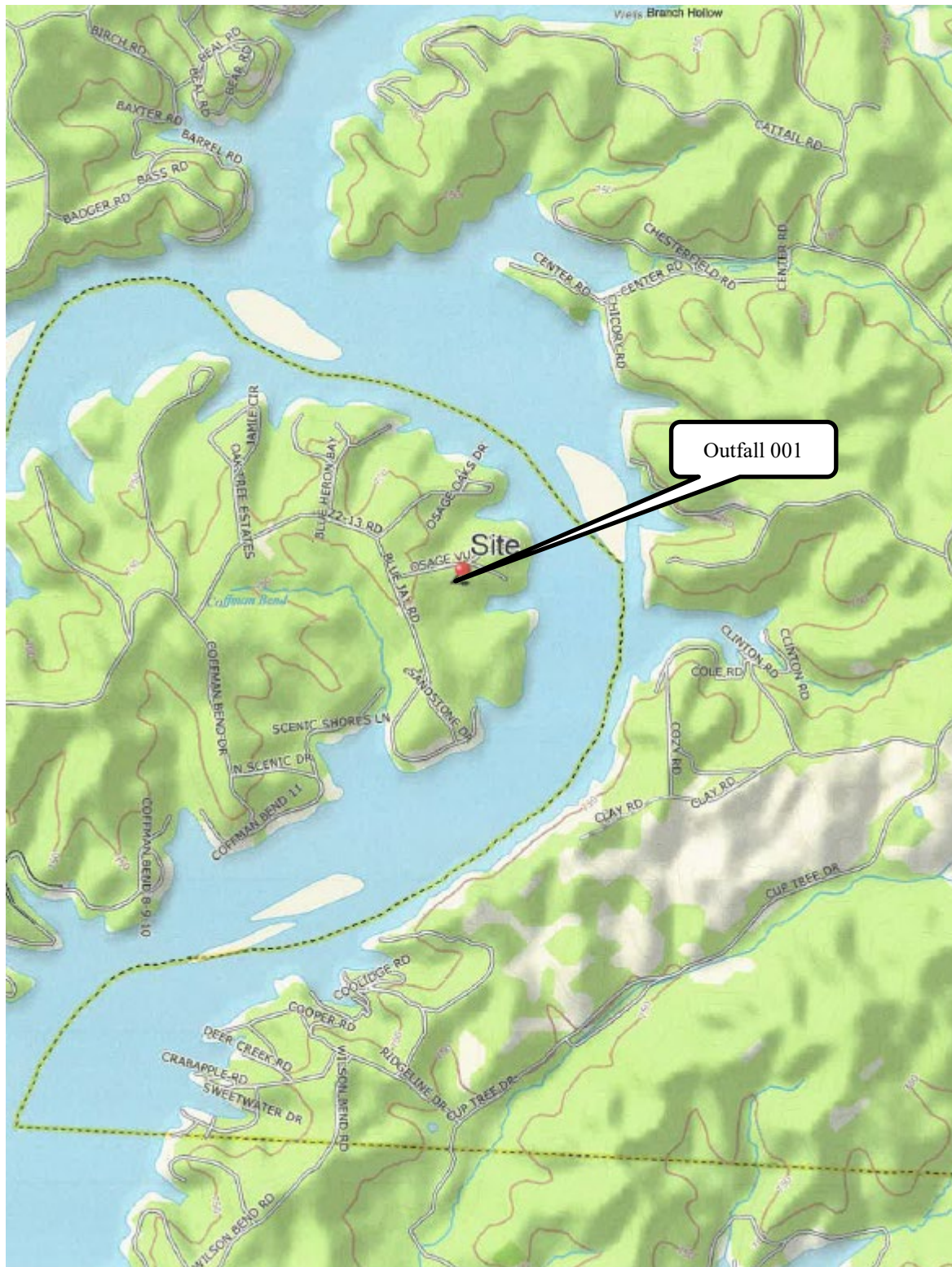
Any treatment option designed to meet these effluent limits may be considered a reasonable alternative in moving forward with the appropriate facility plan, construction permit application, or other future submittals.

If the proposed treatment system is not covered in 10 CSR 20-8 Minimum Design Standards and is considered a new treatment technology, your construction permit application must address approvability of the technology in accordance with the *New Technology Definitions and Requirements* factsheet. If you

have any questions regarding the new technology factsheet, please contact Cindy LePage of the Water Protection Program. The permittee will need to work with the review engineer to ensure equipment is sized properly and that the technology will consistently achieve the proposed effluent limits. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation.

Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. The Department has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

## APPENDIX A: MAP OF DISCHARGE LOCATION



## APPENDIX B: GEOHYDROLOGIC EVALUATION LOCATION



August 20, 2021

Jim Jackson, Jr.  
Lake Professional Engineering Services  
83 Oak Tree Rd  
Camdenton, MO 65020

**RE: Eagle One Subdivision**

Dear Jim Jackson, Jr.:

On July 07, 2021, the Missouri Geological Survey received a request to perform a geohydrologic evaluation for the above referenced project located in Camden County. Included with this letter is a report that details the geologic and hydrologic conditions at the site and the potential for groundwater contamination in the event of wastewater treatment failure.

Thank you for the evaluation request. If you are in need of further assistance or have questions regarding the report, please contact our office at P.O Box 250, Rolla, Mo 65402-0250, by telephone at 573-368-2100 or [gspgeol@dnr.mo.gov](mailto:gspgeol@dnr.mo.gov).

Sincerely,


MISSOURI GEOLOGICAL SURVEY

Fletcher N. Bone  
Geologist  
Environmental Geology Section

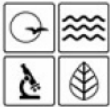
c: Brian Smith  
WPP  
Southwest Regional Office



08/20/2021

	<b>Missouri Department Of Natural Resources</b> Missouri Geological Survey Geological Survey Program Environmental Geology Section	Project ID Number <b>LWE22002</b> County <b>Camden</b>
<b>Request Details</b> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>Project: Eagle One Subdivision</p> <p><b>Organization Official</b>            Name: Brian Smith            Address: PO Box 24206            City: Blue Springs            State: MO Zip: 64013            Phone: 816-218-6435            Email: bkturfman@aol.com</p> </div> <div style="width: 45%;"> <p>Legal Description: 20 T40N R18W            Quadrangle: BOLLINGER CREEK            Latitude: 38 12 58.79            Longitude: -92 56 16.69</p> <p><b>Preparer</b>            Name: Jim Jackson, Jr.            Address: 83 Oak Tree Rd            City: Camdenton            State: MO Zip: 65020            Phone: 573-873-3898            Email:</p> </div> </div>		
<b>Project Details</b> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>Report Date: 08/20/2021            Date of Field Visit: 08/10/2021</p> </div> <div style="width: 45%;"> <p>Previous Reports: Not Applicable</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 30%;"> <p><b>Facility Type</b></p> <p><input type="checkbox"/> Mechanical treatment plant</p> <p><input checked="" type="checkbox"/> Recirculating filter bed</p> <p><input type="checkbox"/> Land application</p> <p><input type="checkbox"/> Lagoon or storage basin</p> <p><input type="checkbox"/> Subsurface soil absorption system</p> <p><input type="checkbox"/> Lagoon or storage basin W/Land App</p> <p><input type="checkbox"/> Lagoon or storage basin W/SSAS</p> <p><input type="checkbox"/> Other type of facility</p> </div> <div style="width: 30%;"> <p><b>Type of Waste</b></p> <p><input type="checkbox"/> Animal</p> <p><input checked="" type="checkbox"/> Human</p> <p><input type="checkbox"/> Process or industrial</p> <p><input type="checkbox"/> Leachate</p> <p><input type="checkbox"/> Other waste type</p> </div> <div style="width: 30%;"> <p><b>Funding Source</b></p> <p><input checked="" type="checkbox"/> IWT</p> <p><input type="checkbox"/> WWL-SRF</p> <p><b>Additional Information</b></p> <p><input type="checkbox"/> Plans were submitted</p> <p><input type="checkbox"/> Site was investigated by NRCS</p> <p><input type="checkbox"/> Soil or geotechnical data were submitted</p> </div> </div> <p><b>Geologic Stream Classification:</b> <input type="checkbox"/> Gaining <input checked="" type="checkbox"/> Losing <input type="checkbox"/> No discharge</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 25%;"> <p><b>Overall Geologic Limitations</b></p> <p><input checked="" type="checkbox"/> Slight</p> <p><input type="checkbox"/> Moderate</p> <p><input type="checkbox"/> Severe</p> </div> <div style="width: 25%;"> <p><b>Collapse Potential</b></p> <p><input checked="" type="checkbox"/> Not applicable</p> <p><input type="checkbox"/> Slight</p> <p><input type="checkbox"/> Moderate</p> <p><input type="checkbox"/> Severe</p> </div> <div style="width: 25%;"> <p><b>Topography</b></p> <p><input type="checkbox"/> &lt;4%</p> <p><input checked="" type="checkbox"/> 4% to 8%</p> <p><input checked="" type="checkbox"/> 8% to 15%</p> <p><input checked="" type="checkbox"/> &gt;15%</p> </div> <div style="width: 25%;"> <p><b>Landscape Position</b></p> <p><input type="checkbox"/> Broad uplands <input type="checkbox"/> Floodplain</p> <p><input checked="" type="checkbox"/> Ridgetop <input type="checkbox"/> Alluvial plain</p> <p><input checked="" type="checkbox"/> Hillslope <input type="checkbox"/> Terrace</p> <p><input checked="" type="checkbox"/> Narrow ravine <input type="checkbox"/> Sinkhole</p> </div> </div> <p><b>Bedrock:</b> The uppermost bedrock is Ordovician-age Gasconade Dolomite and Gunter Sandstone</p> <p><b>Surficial Materials:</b> The surficial materials are sandy silt with gravels and boulders.</p>		



 <b>Missouri Department Of Natural Resources</b> Missouri Geological Survey Geological Survey Program Environmental Geology Section		Project ID Number <b>LWE22002</b> County <b>Camden</b>
<b><u>Recommended Construction Procedures for Earthen Facility</u></b>  <input type="checkbox"/> Installation of clay pad and Compaction  <input type="checkbox"/> Diversion of subsurface flow  <input type="checkbox"/> Artificial sealing  <input type="checkbox"/> Rock excavation  <input type="checkbox"/> Limit excavation depth	<b><u>Determine Overburden Properties</u></b> <input type="checkbox"/> Particle size analysis  <input type="checkbox"/> Atterberg limits  <input type="checkbox"/> 95% Max. dry density test method  <input type="checkbox"/> Overburden thickness  <input type="checkbox"/> Permeability coefficient-undisturbed  <input type="checkbox"/> Permeability coefficient-remolded	<b><u>Determine Hydrologic Conditions</u></b> <input type="checkbox"/> Groundwater elevation  <input type="checkbox"/> Direction of groundwater flow  <input type="checkbox"/> 25-Year flood level  <input type="checkbox"/> 100-Year flood level

**Remarks:**

On August 10, 2021, a geologist with the Missouri Geological Survey (MGS) performed a geohydrologic evaluation for a proposed discharging recirculating filter bed that will serve Eagle One Subdivision in Climax Springs, Missouri. The purpose of the site visit is to observe the geologic and hydrologic elements of the site and determine the potential for groundwater contamination in the event of wastewater treatment failure.

The uppermost bedrock is Ordovician-age Gasconade Dolomite and Gunter Sandstone. These bedrock types are highly permeable and consist of sandstone and vuggy, dolomite. The Gunter Sandstone is the uppermost bedrock within the lower elevations of the site, approximately 20 feet above the seasonal pool level of the Lake of the Ozarks, down to the water line. The surficial materials consist of sandy silt with gravels where the underlying bedrock is the Gunter Sandstone. Above this, the surficial materials are silty, cherty residuum derived from the underlying Gasconade Dolomite.

There are no known sinkholes or springs located within 1 mile of the site. However, the Little Proctor Creek structure is located within 1 mile of the site.

The wastewater treatment facility will discharge to Lake of the Ozarks. Although the area exhibits losing characteristics, based on the close proximity of Lake of the Ozarks, the receiving stream will be considered gaining for discharge purposes, but formally classified as losing. Furthermore, based on the geologic and hydrologic conditions observed, the site receives an overall slight geologic limitations rating, primarily based on the method of wastewater treatment and close proximity to Lake of the Ozarks. In the event of treatment failure, impact to regional groundwater supplies would be minimal; however, surface waters of Lake of the Ozarks, and shallow groundwater, may be adversely impacted.



## APPENDIX C: NATURAL HERITAGE REVIEW



### Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

#### **Natural Heritage Review Level Three Report: Species Listed Under the Federal Endangered Species Act**

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

**Foreword:** Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this website is to provide information to federal, state and local agencies, organizations, municipalities, corporations and consultants regarding sensitive fish, wildlife, plants, natural communities and habitats to assist in planning, designing and permitting stages of projects.

#### **PROJECT INFORMATION**

**Project Name and ID Number:** Shores of Eagles Landing #9798

**Project Description:** Wastewater treatment plant for a 33 home development, N38d 12'59.21" W092d 56'17.44", Lake of the Ozarks, Camden County

**Project Type:** Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Construction or expansion

**Contact Person:** Jim Jackson

**Contact Information:** jimjacksonjr@charter.net or 573-873-3898

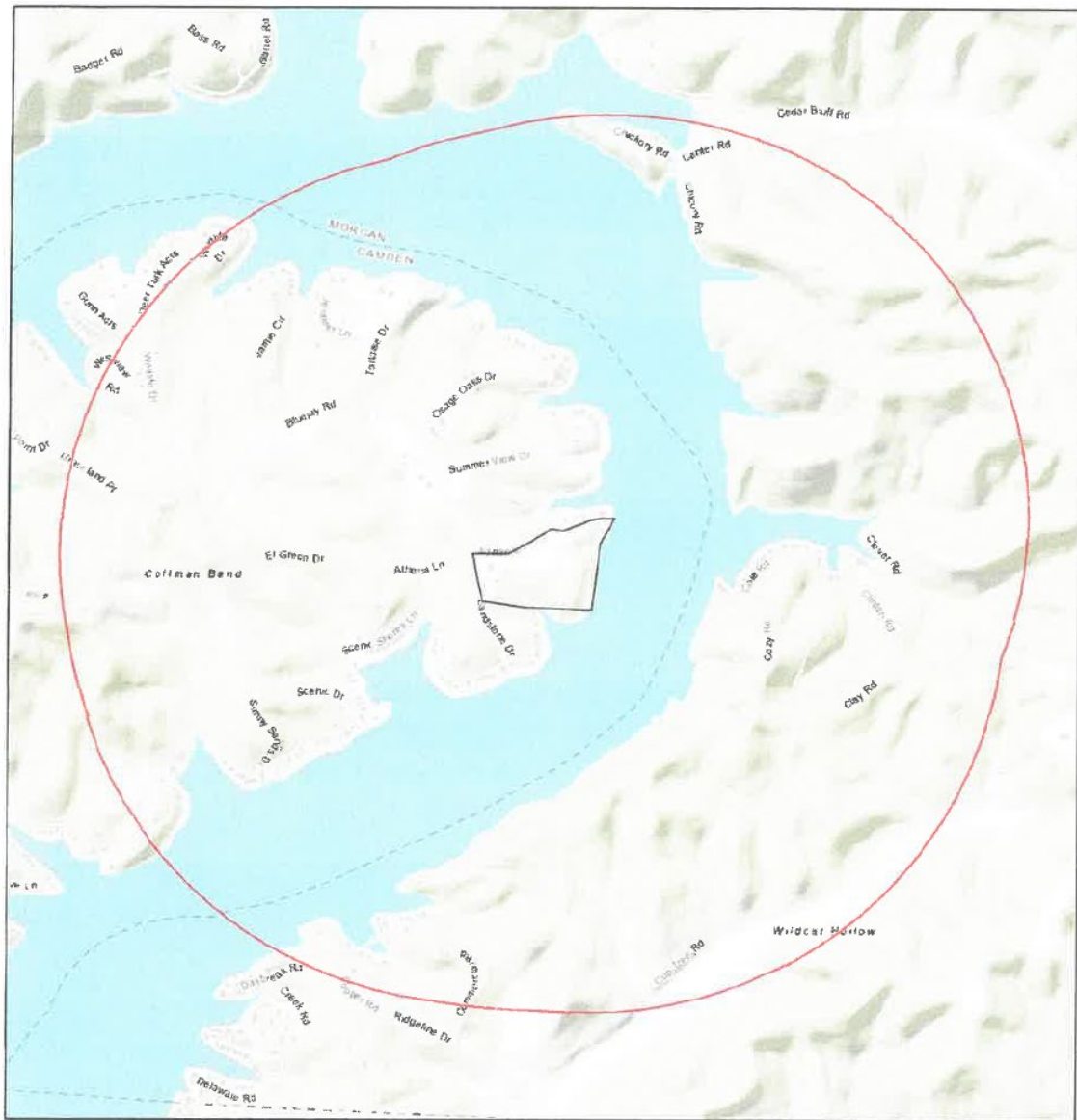
**Disclaimer:** The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive species or special habitats. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information. The Natural Heritage Program tracks occurrences of sensitive species and natural communities where the species or natural community has been found. Lack of an occurrence record does not mean that a sensitive plant, animal or natural community is not present on or near the project area. Depending on the project, current habitat conditions, and geographic location in the state, surveys may be necessary. Additionally, because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, Reports include information about records near but not necessarily on the project site.

The Natural Heritage Report is not a site clearance letter for the project. It provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project. Incorporating information from the Natural Heritage Program into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive fish, forest and wildlife resources. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

**U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination:** Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. The information within this report is not intended to replace Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit the USFWS Information for Planning and Conservation (IPaC) website at <https://ecos.fws.gov/ipac/> for further information. This site was developed to help streamline the USFWS environmental review process and is a first step in ESA coordination. The Columbia Missouri Ecological Field Services Office may be reached at 573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203.

**Transportation Projects:** If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit <https://www.modot.org/> for additional information on recommendations.

## Shores of Eagles Landing



October 4, 2021

- Project Boundary
- Buffered Project Boundary

1:21,894

0 0.175 0.35 0.7 mi

0 0.3 0.6 1.2 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

### Species or Communities of Conservation Concern within the Area:

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

MDC Natural Heritage Review  
Science Branch  
P.O. Box 180  
Jefferson City, MO  
65102-0180  
Phone: 573-522-4115 ext. 3182  
[NaturalHeritageReview@mdc.mo.gov](mailto:NaturalHeritageReview@mdc.mo.gov)

U.S. Fish and Wildlife Service  
Ecological Service  
101 Park Deville Drive  
Suite A  
Columbia, MO  
65203-0007  
Phone: 573-234-2132

### Other Special Search Results:

No results have been identified for this project location.

### Project Type Recommendations:

**Waste Transfer, Treatment and Disposal -Wastewater treatment plant: New or Maintenance;** [Clean Water Act](#) permits issued by other agencies regulate both construction and operation of wastewater systems, and provide many important protections for fish and wildlife resources throughout the project area and at some distance downstream. Fish and wildlife almost always benefit when unnatural pollutants are removed from water, and concerns are minimal if construction is managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any "Clean Water Permit" conditions.

Revegetation of disturbed areas is recommended to minimize erosion, as is restoration with of native plant species compatible with the local landscape and for wildlife needs. Annuals like ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza.

Management Recommendations for Construction Projects Affecting Missouri Streams and Rivers is a Conservation Department publication available at [http://mdc.mo.gov/sites/default/files/resources/2013/02/constprojnearstreams\\_2013.pdf](http://mdc.mo.gov/sites/default/files/resources/2013/02/constprojnearstreams_2013.pdf)

### Project Location and/or Species Recommendations:

**Endangered Species Act Coordination - Indiana bats (*Myotis sodalis*, federal- and state-listed endangered) and Northern long-eared bats (*Myotis septentrionalis*, federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April. **If any trees need to be removed for your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 ext. 100 for Ecological Services) for further coordination under the Endangered Species Act.****

The project location submitted and evaluated is within the geographic range of nesting Bald Eagles in Missouri. Bald Eagles (*Haliaeetus leucocephalus*) may nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. Adults begin nesting activity in late December and January and young birds leave the nest in late spring to early summer. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: <http://www.fws.gov/midwest/MidwestBird/EaglePermits/index.html> if eagle nests are seen.

The submitted project location is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream.



**Invasive exotic species** are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See

<https://mdc.mo.gov/community-conservation/managing-invasive-species-your-community> for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

**Streams and Wetlands – Clean Water Act Permits:** Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (<http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx>) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (<http://dnr.mo.gov/env/wpp/401/index.html>), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit <http://dnr.mo.gov/env/wpp/permits/index.html> for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

**For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:**

MDC Natural Heritage Review  
Science Branch  
P.O. Box 180  
Jefferson City, MO  
65102-0180  
Phone: 573-522-4115 ext. 3182  
[NaturalHeritageReview@mdc.mo.gov](mailto:NaturalHeritageReview@mdc.mo.gov)

U.S. Fish and Wildlife Service  
Ecological Service  
101 Park Deville Drive  
Suite A  
Columbia, MO  
65203-0007  
Phone: 573-234-2132

#### **Miscellaneous Information**

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 10-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See [https://mdc.mo.gov/sites/default/files/mo\\_nature/downloads/2021\\_SOCC.pdf](https://mdc.mo.gov/sites/default/files/mo_nature/downloads/2021_SOCC.pdf) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at [https://mdc12.mdc.mo.gov/applications/mofwis/mofwis\\_search1.aspx](https://mdc12.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx). If you would like printed copies of best management practices cited as internet URLs, please contact the Missouri Department of Conservation.

## APPENDIX D: ANTIDEGRADATION REVIEW SUMMARY FORMS

The forms that follow contain summary information provided by the applicant. Department staff determined that the following changes must be made to the information contained within these forms:

- 1) Antidegradation Review Submittal: Voluntary Tier 2 – Significant Degradation for Domestic Wastewater Facilities with Design Flow Less Than 50,000 Gallons Per Day:

		<b>MISSOURI DEPARTMENT OF NATURAL RESOURCES</b> <b>WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH</b> <b>ANTIDEGRADATION REVIEW SUBMITTAL</b> <b>VOLUNTARY TIER 2 – SIGNIFICANT DEGRADATION FOR DOMESTIC</b> <b>WASTEWATER FACILITIES WITH DESIGN FLOW LESS THAN 50,000</b> <b>GALLONS PER DAY</b>		<b>FOR DEPARTMENT USE ONLY</b>	
				APP NO.	
		CHECK NO.		CHECK NO.	
		DATE RECEIVED			

<b>1. APPLICABILITY</b>					
<p>If you answer "Yes" to any of the below questions, a site-specific alternatives analysis may be required.</p> <p>The Missouri Department of Natural Resources' alternatives analysis is <i>not</i> applicable to facilities that have a Total Maximum Daily Load (TMDL) or are 303(d) or 305(b) listed for the pollutants of concern addressed in this alternatives analysis, with an exception for <i>E. coli</i> since disinfection will be required.</p> <p>Facilities currently under enforcement will need to coordinate with the Water Protection Program's compliance and enforcement section to determine applicability for the department's alternatives analysis.</p>					
1.1	Does the receiving waterbody or downstream waterbody have a Total Maximum Daily Load (TMDL)?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1.2	Is the receiving waterbody or downstream waterbody 303(d) or 305(b) listed as impaired or potentially impaired?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1.3	Is the facility currently under enforcement with the department or the U.S. Environmental Protection Agency?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1.4	Is the design flow 50,000 gallons per day or more?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1.5	Is a non-discharging system a viable option?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>Submit the following with this form:</p> <p><input checked="" type="checkbox"/> Regionalization and No Discharge Evaluation Form – Available on the department's website</p> <p><input checked="" type="checkbox"/> Copy of the Geohydrologic Evaluation – Submit request through the Missouri Geological Survey website</p> <p><input checked="" type="checkbox"/> Copy of the Missouri Natural Heritage Review from the Missouri Department of Conservation website</p>					
<b>2. FACILITY</b>					
NAME Shores of Eagles View Wastewater Treatment Plant			COUNTY Camden		
ADDRESS (PHYSICAL) Adrian Lane		CITY Climax Springs	STATE MO	ZIP CODE 65324	
<b>3. OWNER</b>					
NAME Brian Smith					
ADDRESS PO Box 24206		CITY Blue Springs	STATE MO	ZIP CODE 64013	
EMAIL ADDRESS tkurfman@aol.com		TELEPHONE NUMBER WITH AREA CODE 816-215-6435			
<b>4. CONTINUING AUTHORITY</b> The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(2).					
NAME Shores of Eagles View Home Owners Association			SECRETARY OF STATE CHARTER NUMBER		
ADDRESS PO Box 24206		CITY Blue Springs	STATE MO	ZIP CODE 64013	
EMAIL ADDRESS tkurfman@aol.com		TELEPHONE NUMBER WITH AREA CODE 816-215-6435			

<b>5. RECEIVING WATER BODY SEGMENT #1</b>	
NAME Lake of the Ozarks	
5.1 Upper end of segment – Location of discharge UTM: X= _____, Y= _____ OR Lat <u>N38d 12'59.21"</u> , Long <u>W092d 56'17.44"</u>	
5.2 Lower end of segment – UTM: X= _____, Y= _____ OR Lat _____, Long _____ Per the Missouri Antidegradation Implementation Procedure (AIP), the definition of a segment is: "A section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."	
<b>6. WATER BODY SEGMENT #2 (If Necessary)</b>	
NAME	
6.1 Upper end of segment – End of Segment #1 UTM: X= _____, Y= _____ OR Lat _____, Long _____	
6.2 Lower end of segment – UTM: X= _____, Y= _____ OR Lat _____, Long _____	
<b>7. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE</b>	
This section must be completed with adequate and thorough descriptions of the social and economic importance associated with the proposed project in accordance with the Antidegradation Implementation Procedure Section II.E for discharge to be allowed.	
Social and economic importance is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanding discharge.	
<b>7.1 Identify the affected community:</b> (The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located." Per the Antidegradation Implementation Procedure Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project.")  The site for the proposed treatment plant is located on Adrian Road, Climax Springs, Missouri. The subdivision is located approximately 13.25 miles from the city limits of Climax Springs. The area is primarily an undeveloped wooded area. The addition of the wastewater treatment plant would prevent the possibility of unmonitored septic drain fields for 33 houses from the Lake of the Ozarks. The leaking drain field is an environmental hazard to the residents of the Lake of the Ozarks as well as to the surrounding animal life. The Lake of the Ozarks has been the target of an E.Coli investigation and there is pending legislation that would declare the Lake of the Ozarks as a distressed waterway. If the Lake of the Ozarks is declared a distressed waterway, septic fields will become the primary source of investigation. This proposed treatment plant would prevent the effluent of unmonitored septic fields from entering the Lake of the Ozarks. Therefore, the effected community is the people who vacation and enjoy the Lake of the Ozarks as well as the landowners and residents of the Lake of the Ozarks area.	
<b>7.2 Identify the important social and economic development associated with the project:</b>  Will the proposed discharging activity:	
Create or expand employment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A
Increase median family income?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A
Reduce the number of households below the poverty line?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Don't know <input type="checkbox"/> N/A
Increase the community tax base?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A
Increase needed housing supply?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A
Provide necessary public services (e.g., school, infrastructure, fire department, etc.)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A
Correct a public health, safety, or environmental problem?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A
Other:	

10. SUMMARY OF THE POLLUTANTS OF CONCERN AND EFFLUENT LIMITS

Pollutants of concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.A. and assumed or demonstrated to cause significant degradation. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031(2). All POCs in this alternatives analysis were considered to be Tier 2 and significantly degrading in the absence of existing water quality.

As a result of this alternatives analysis review, the department has determined, depending on site specific conditions, there are treatment technologies available that may be economically efficient and practicable, which are capable of meeting the effluent limitations below. If the facility owners do not believe there is a treatment technology that is economically efficient, affordable, or practicable for their facility to meet these limits, a site-specific alternatives analysis will be required.

The chosen alternative must be capable of meeting the following effluent limitations:

EFFLUENT LIMITS—OUTFALLS TO LAKES				
Pollutant of Concern*	Units	Daily Maximum	Weekly Average	Monthly Average
BOD <sub>5</sub>	MG/L		15	10
TSS	MG/L		20	15
pH	SU	6.5–9.0		6.5–9.0
Ammonia as N Summer	MG/L	3.6		1.4
Ammonia as N Winter	MG/L	7.5		2.9
Total Phosphorus****	MG/L	*		0.5
<i>Escherichia coli</i> ( <i>E. coli</i> )	#/100ML	630***		126

EFFLUENT LIMITS—ALL OTHER OUTFALLS				
BOD <sub>5</sub>	mg/L		15	10
TSS	mg/L		15	10
pH	SU	6.5–9.0		6.5–9.0
Ammonia as N Summer	mg/L	1.7		0.6
Ammonia as N Winter	mg/L	5.6		2.1
Total Phosphorus****	mg/L	*		0.5
<i>Escherichia coli</i> ( <i>E. coli</i> )	WBC(A) AND WBC (B)	#/100 ML	630***	126
	Losing Stream**	#/100 ML	126***	Monitoring only

\* Permit limits for other parameters, including oil and grease, total residual chlorine and nitrates, will be included in the operating permit based on applicable water quality standards and criteria.

Total residual chlorine (TRC) effluent limits of 0.017 mg/L daily maximum, 0.008 mg/L monthly average are recommended if chlorine is used as a disinfectant. Standard compliance language for TRC, including the minimum level (ML), may be included in the operating permit.

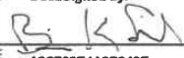
\*\* For any facility that will discharge to a waterbody designated as a losing stream or within two miles flow distance upstream of a losing stream.

\*\*\* Publicly owned treatment works will receive a weekly average limit and private facilities will receive a daily maximum limit.


\*\*\*\* Total Phosphorus limits are only applicable to discharges to a lake or watershed of a lake that is a water of the state and has an area of at least 10 acres during normal pool conditions

If any Tier 1 Pollutants of Concern not addressed in this alternatives analysis will be discharged, the applicant must submit Attachment D: Tier 1 Review for those pollutants.



<b>11. APPLICATION FEE</b>	
<input type="checkbox"/> CHECK NUMBER	<input type="checkbox"/> JETPAY CONFIRMATION NUMBER
<b>12. SIGNATURE</b>	
I am authorized and hereby certify that I am familiar with the information contained in this document and to the best of my knowledge and belief such information is true, complete and accurate.	
SIGNATURE <small>DocuSigned by:</small> 	DATE 9-17-21
PRINT NAME <small>A2C786E4A9D843F</small> Brian K. Smith	TITLE
PLEASE IDENTIFY YOUR STATUS FOR THIS PROJECT: <input checked="" type="checkbox"/> OWNER <input type="checkbox"/> CONTINUING AUTHORITY <input type="checkbox"/> CONSULTANT	

2) Antidegradation Review Summary/Request

 <b>MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH ANTIDEGRADATION REVIEW SUMMARY / REQUEST</b>		<b>FOR DEPARTMENT USE ONLY</b> APP NO. FEE RECEIVED <u>\$500.00</u> CHECK NO. <u>3248</u> DATE RECEIVED <u>10-12-21</u> <u>8B</u>	
<b>1. FACILITY</b>			
NAME Shores of Eagles View Wastewater Treatment Plant		COUNTY Camden	
ADDRESS (PHYSICAL) Adrian Lane	CITY Climax Springs	STATE MO	ZIP CODE 65324
PERMIT NUMBER	PROPOSED DESIGN FLOW 9,157.5 gpd	SIC / NAICS CODE	
<b>2. OWNER</b>			
NAME Brian Smith			
ADDRESS PO Box 24206	CITY Blue Springs	STATE MO	ZIP CODE 64013
EMAIL ADDRESS tkurfman@aol.com		TELEPHONE NUMBER WITH AREA CODE 816-215-6435	
<b>3. CONTINUING AUTHORITY</b> The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(2).			
NAME Shores of Eagles View Home Owners Association		SECRETARY OF STATE CHARTER NUMBER	
ADDRESS PO Box 24206	CITY Blue Springs	STATE MO	ZIP CODE 64013
EMAIL ADDRESS tkurfman@aol.com		TELEPHONE NUMBER WITH AREA CODE 816-215-6435	
<b>4. CONSULTANT</b>			
PREPARER NAME Jim Jackson, Jr., PE		COMPANY NAME Lake Professional Engineering Services, Inc	
ADDRESS 83 Oak Tree Road	CITY Camdenton	STATE MO	ZIP CODE 65020
EMAIL ADDRESS jimjacksonjr@charter.net		TELEPHONE NUMBER WITH AREA CODE 573-876-3898	
<b>5. RECEIVING WATER BODY SEGMENT #1</b>			
NAME Lake of the Ozarks			
5.1 Upper end of segment – Location of discharge UTM: X= _____, Y= _____ OR Lat <u>N38d 12'59.21"</u> , Long <u>W092d 56'17.44"</u>			
5.2 Lower end of segment – UTM: X= _____, Y= _____ OR Lat _____, Long _____			
Per the Missouri Antidegradation Implementation Procedure (AIP), the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."			
<b>6. WATER BODY SEGMENT #2 (IF APPLICABLE, Use another form if a third segment is needed)</b>			
NAME			
6.1 Upper end of segment – End of Segment #1 UTM: X= _____, Y= _____ OR Lat _____, Long _____			
6.2 Lower end of segment – UTM: X= _____, Y= _____ OR Lat _____, Long _____			
<b>7. DECHLORINATION</b>			
If chlorination and dechlorination is the existing or proposed method of disinfection treatment, will the effluent discharged be equal to or less than the Water Quality Standards for Total Residual Chlorine stated in Table A1 of 10 CSR 20-7.031?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No – What is the proposed method of disinfection? <u>Membrane Bio Reactor</u>			
Based on the disinfection treatment system being designed for total removal of Total Residual Chlorine, minimal degradation for Total Residual Chlorine is assumed and the facility will be required to meet the water quality based effluent limits. These compliance limits for Total Residual Chlorine are much less than the method detection limit of 0.13 mg/L.			

**8. SUMMARIZE THE FEASIBILITY OF CONSTRUCTING A NO-DISCHARGE TREATMENT WASTEWATER FACILITY**

According to the Antidegradation Implementation Procedure Sections I.B. and II.B.1., the feasibility of no-discharge alternatives must be considered. No-discharge alternatives may include connection to a regional treatment facility, surface land application, subsurface land application, and recycle or reuse.

Non-discharging alternative were investigated. Most were deemed non-feasible due to the lack of available area. To make the are affordable, the lots were made smaller to help bring the price of the lots down. This area is inadequate in size for all non-discharging options.

Connection to regional treatment facility was investigated. There is no municipality to connect to within 10 miles of the site

## 9. ADDITIONAL REQUIREMENTS

**Complete and submit the following with this submittal:**

- ☒ Copy of the Geohydrologic Evaluation – Submit request through the Missouri Geological Survey website
- ☒ Copy of the Missouri Natural Heritage from the Missouri Department of Conservation website
- ☒ Attach your Antidegradation Review Report and all supporting documentation as these forms are only a summary.
- ☐ If applicable, submit a copy of any Existing Water Quality data used in this process. Include the date range of the data, source(s) of the data, and location of data collection relative to the outfall. If using your own collected water quality data, submit a copy of the Quality Assurance Project Plan (QAPP) approved by the department's Watershed Protection Section. For more detailed information, see the Missouri Antidegradation Implementation Procedure (AIP), Section II.A.1.

**10. PATH / TIER REVIEW ATTACHMENTS ENCLOSED**

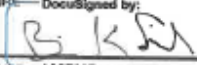
Path A: Tier 2 – Non-Degradation Mass Balance	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Path B: Tier 2 – Minimal Degradation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Path C: Tier 2 – Significant Degradation	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Path D: Tier 1 – Preliminary Review Request	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Path E: Temporary Degradation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

#### 11. APPLICANT PROPOSED ANTIDegradation REVIEW EFFLUENT LIMITS

Preliminary effluent limits for the proposed project are dependent upon the path selected:

[illegible]

\* Place an X in appropriate box for the concentration units for each Pollutant of Concern.

<b>12. PROPOSED PROJECT SUMMARY</b>	
Membrane Bioreactor treatment with all necessary equipment & Collection System	
Applicants choosing to use a new wastewater technology that are considered an "unproven technology" in Missouri must comply with the requirements set forth in the <i>New Technology Definitions and Requirements fact sheet</i> .	
<b>13. CONTINUING AUTHORITY WAIVER (For New Discharges)</b>	
In accordance with 10 CSR 20-6.010(2)(C), applicants proposing use of a lower preference continuing authority, when the higher level authority is available, must submit a waiver from the existing higher authority one or other documentation for the department's review, provided it does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or by the Missouri Clean Water Commission. Is the waiver necessary? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, provide a copy.	
<b>14. APPLICATION FEE</b>	
<input type="checkbox"/> CHECK NUMBER	<input type="checkbox"/> JETPAY CONFIRMATION NUMBER
<b>15. SIGNATURE</b>	
I am authorized and hereby certify that I am familiar with the information contained in this document and to the best of my knowledge and belief such information is true, complete and accurate.	
SIGNATURE DocuSigned by: 	DATE 9-17-21
PRINT NAME A2C78BE4A9D643F... Brian K. Smith	TITLE
PLEASE IDENTIFY YOUR STATUS FOR THIS PROJECT: <input checked="" type="checkbox"/> OWNER <input type="checkbox"/> CONTINUING AUTHORITY <input type="checkbox"/> CONSULTANT	

### 3) Antidegradation: Regionalization and No-Discharge Evaluation:



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH  
**ANTIDEGRADATION: REGIONALIZATION AND NO-DISCHARGE EVALUATION**

#### REGIONALIZATION AND NO-DISCHARGE EVALUATION

According to the Antidegradation Implementation Procedure Sections I.B. and II.B.1., the feasibility of no-discharge alternatives must be considered. No-discharge alternatives may include connection to a regional treatment facility, surface land application, subsurface land application, and recycle or reuse.

Please refer to the *No-Discharge Alternative Evaluation* fact sheet for examples of information to provide to justify common reasons for not pursuing regionalization or no-discharge land application. If sufficient information is not provided on this form to demonstrate that these alternatives are not feasible, a more detailed evaluation of no-discharge options may have to be submitted.

Additional pages may be attached if more room is needed.

#### 1. FACILITY:

NAME	COUNTY
Shores of Eagles View Wastewater Treatment Plant	Camden

#### 2. EVALUATION OF REGIONALIZATION (Complete all applicable reasons why regionalization was not pursued)

##### 2.1 Regionalization Feasibility:

- A. What is the distance to connect to the closest municipality's line or other facility's line? 15 miles
- B. List facilities contacted about possible regionalization. City of Climax Springs
- C. Is there any planning or zoning in the area regarding development and services? Camden County Planning and Zoning
- D. Who would have the responsibility to maintain the sewer connection line? Brian Smith
- E. What is the estimated cost for piping and pumps to regionalize? \$2,376,000
- F. Explain any engineering challenges with the regionalization connection – topography, rivers, highways, or other issues.  
Undulating terrain
- G. Does a regional facility have the capacity to treat the additional effluent from this project? NO – No facility available
- H. Were land owners contacted for rights to an easement? ☐ Yes ☒ No
- I. Describe the easement issues:  
The nearest city has no regional wastewater treatment plant

##### 2.2 Summarize why regionalization was not a practicable or economically efficient alternative

The City of Climax Springs has no wastewater treatment facility

### 3. EVALUATION OF NO-DISCHARGE LAND APPLICATION

Check all applicable reasons why no-discharge land application was not pursued:

#### ☐ 3.1 Land Availability and Cost:

- A. Is land available for land application? ☐ Yes ☒ No

If not, explain: The houses take up most of the lots.

If yes, answer the following:

- B. How many acres are required for land application of the effluent? 2.42 acres or 18,000 square feet

- C. Provide a breakdown of the capital cost for any necessary additional land, piping, pumps, and irrigation equipment?

- D. Were long-term costs evaluated and compared for upgrading to a mechanical plant with future Water Quality Standards changes (i.e. mussel ammonia, bacteria, TP, TN) versus cost for a land application system? ☐ Yes ☒ No

- E. Were land owners contacted for rights to an easement? ☐ Yes ☒ No

- F. Describe the easement issues:

The closest municipality is the City of Climax Springs. The city has no wastewater treatment facility

#### ☐ 3.2 Zoning or Suitability of Site in Proximity to Neighboring Sites or Waterbodies:

- A. Was drip or subsurface irrigation evaluated as opposed to surface application? ☒ Yes ☐ No
- B. Does the county ordinance specifically restrict land application, surface and subsurface? ☐ Yes ☒ No
- C. Can a vegetated buffer be installed to reduce necessary buffer distances? ☐ Yes ☒ No
- D. Are there other steps or considerations that can be made?

#### ☒ 3.3 Unsuitability of Geology or Soils

- A. Is a geohydrologic evaluation, county soils survey map, or other resource showing suitability and application rates included with this application? ☒ Yes ☐ No
- B. Is it cost-effective to bring in additional soils? ☐ Yes ☒ No
- C. Can the application rate be decreased to a suitable rate? ☐ Yes ☒ No
- D. Were subsurface application alternatives (e.g. low pressure pipe, drip) considered? ☒ Yes ☐ No
- E. If collapse potential is a concern, was using a liner or alternative site evaluated? ☐ Yes ☒ No

#### 3.4 Summarize why no-discharge land application was not a practicable or economically efficient alternative

The area needed for on on-site septic system is 10,000 square feet. The available area is very steep with shallow soils. Leaching in to the Lake of the Ozarks is likely.

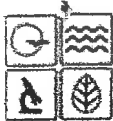
#### 4. DOCUMENTATION

**4.1 Is any other written correspondence or documentation included with this application to provide further justification for not pursuing a no-discharge option or regionalization?**

☐ No

☒ Yes:

- ☐ A letter from an existing higher preference continuing authority waiving preferential status where service is not available in accordance with 10 CSR 20-6.0 10 (2) or if capacity is not available.
- ☐ A letter from the existing higher preference continuing authority stating that the regional facility has no interest in taking flow from the new or expanded facility.
- ☐ A letter from the regional municipality stating that the project area is outside city limits and annexation would be required.
- ☐ Council meeting minutes.
- ☐ Correspondence with land owners regarding easement rights.
- ☐ Correspondence with land owners regarding land for sale or lease.
- ☐ Letters from the community or a consulting engineer regarding availability, proximity, and location of suitable land and the reasonable cost of such land.
- ☐ Documentation of recent land sales or appraisals.
- ☒ Calculations for sizing a land application system.
- ☐ Detailed cost estimates for a land application system or regionalization including lift stations, piping, easements, liners, and/or connection costs.
- ☐ Geohydrologic evaluation or other soils report.
- ☐ Copy of a county or city ordinance.
- ☐ Verification of funding from State Revolving Fund, which does not fund projects outside city limits.
- ☐ Other:



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

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED \$1000.00	CHECK NO. 3260
DATE RECEIVED 11-29-21	8B

**APPLICATION OVERVIEW**

The Application for Construction Permit – Wastewater Treatment Facility 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 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?  
☐ YES Date of Approval: \_\_\_\_\_ ☐ N/A
- 1.3 Has the department approved the proposed project's facility plan\*?  
☐ YES Date of Approval: \_\_\_\_\_ ☒ NO (If No, complete No. 1.4.)
- 1.4 [Complete only if answered No on No. 1.3.] Is a copy of the facility plan\* for wastewater treatment facilities included with this application?  
☒ YES ☐ NO ☐ Exempt because \_\_\_\_\_
- 1.5 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
- 1.6 Is a summary of design\* included with this application? ☒ YES ☐ NO
- 1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?  
☐ YES Date of submittal: \_\_\_\_\_  
☐ Enclosed is the appropriate operating permit application and fee submittal. Denote which form: ☐ A ☒ B ☐ B2  
☐ N/A: However, in the event the department believes that my operating permit requires revision to permit limitation such as changing equivalent to secondary limits to secondary limits or adding total residual chlorine limits, please share a draft copy prior to public notice? ☐ YES ☐ NO
- 1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? ☐ YES ☒ NO
- 1.9 Is the appropriate fee or JetPay confirmation included with this application? ☐ YES ☒ NO  
See Section 7.0

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

**2.0 PROJECT INFORMATION**

2.1 NAME OF PROJECT Shores of Eagles View Wastewater Treatment Plant	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$ 140,000
---	---

2.3 PROJECT DESCRIPTION  
Membrane Bio Reactor and collection system for 33 residential lots.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION  
Septic Tanks

2.5 DESIGN INFORMATION  
A. Current population: 122.1; Design population: 122.1  
B. Actual Flow: 9,158 gpd; Design Average Flow: 9,158 gpd;  
Actual Peak Daily Flow: \_\_\_\_\_ gpd; Design Maximum Daily Flow: \_\_\_\_\_ gpd; Design Wet Weather Event: 0

2.6 ADDITIONAL INFORMATION  
A. Is a topographic map attached? ☒ YES ☐ NO  
B. Is a process flow diagram attached? ☒ YES ☐ NO

RECEIVED

NOV 29 2021

Water Protection Program



**3.0 WASTEWATER TREATMENT FACILITY**

NAME <u>Shores of Eagles View</u>		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS	
ADDRESS (PHYSICAL)		CITY <u>MO</u>	STATE <u>MO</u>	ZIP CODE	COUNTY <u>Camden</u>

Wastewater Treatment Facility: Mo- (Outfall 1 Of 1)

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):        Northing (Y):         
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Lake of the Ozarks

**4.0 PROJECT OWNER**

NAME <u>Eagle Construction Brian Smith</u>		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS	
ADDRESS <u>PO Box 24206</u>		CITY <u>Blue Springs</u>	STATE <u>MO</u>	ZIP CODE <u>64013</u>	

**5.0 CONTINUING AUTHORITY:** A continuing authority is a company, business, entity or person(s) that will be operating the facility and/or ensuring compliance with the permit requirements.

NAME <u>Shores of Eagle View HOA</u>		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS	
ADDRESS <u>PO Box 24206</u>		CITY <u>Blue Springs</u>	STATE <u>MO</u>	ZIP CODE <u>64013</u>	

5.1 A letter from the continuing authority, if different than the owner, is included with this application. ☐ YES ☐ NO ☒ 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? ☐ YES ☐ 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? ☒ YES ☐ 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? ☐ YES ☒ 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? ☐ YES ☒ NO
- D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☐ YES ☒ NO

**6.0 ENGINEER**

ENGINEER NAME / COMPANY NAME <u>James Jackson Jr PE Lake Professional Engineering Service</u>		TELEPHONE NUMBER WITH AREA CODE <u>573-873-3898</u>		E-MAIL ADDRESS <u>Jim.Jackson.Jr@charter.net</u>	
ADDRESS <u>83 Oak Tree Rd</u>		CITY <u>Camden</u>	STATE <u>MO</u>	ZIP CODE <u>65020</u>	

**7.0 APPLICATION FEE**

☐ CHECK NUMBER

☐ JETPAY CONFIRMATION NUMBER

**8.0 PROJECT OWNER:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE <u>Brian K. Smith</u>		DATE <u>9-17-21</u>	
PRINTED NAME <u>Brian K. Smith</u>			
TITLE OR CORPORATE POSITION		TELEPHONE NUMBER WITH AREA CODE	
		E-MAIL ADDRESS	

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.**

<b>3.0 WASTEWATER TREATMENT FACILITY</b>					
NAME Shores of Eagles View Wastewater Treatment Plant		TELEPHONE NUMBER WITH AREA CODE 816-215-6435		E-MAIL ADDRESS tkurfman@aol.com	
ADDRESS (PHYSICAL) Adrian Lane		CITY Climax Springs	STATE MO	ZIP CODE 65324	COUNTY Camden
Wastewater Treatment Facility: Mo- (Outfall 1 Of 1 )					
3.1 Legal Description: NW ¼, SE ¼, SE ¼, Sec. 20, T 40, R 18 (Use additional pages if construction of more than one outfall is proposed.)					
3.2 UTM Coordinates Easting (X): _____ Northing (Y): _____ For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)					
3.3 Name of receiving streams: Lake of the Ozarks					
<b>4.0 PROJECT OWNER</b>					
NAME Brian Smith		TELEPHONE NUMBER WITH AREA CODE 816-215-6435		E-MAIL ADDRESS tkurfman@aol.com	
ADDRESS PO Box 24206		CITY Blue Springs	STATE MO	ZIP CODE 64013	
<b>5.0 CONTINUING AUTHORITY:</b> A continuing authority is a company, business, entity or person(s) that will be operating the facility and/or ensuring compliance with the permit requirements.					
NAME Shores of Eagles View Home Owners Association		TELEPHONE NUMBER WITH AREA CODE 816-215-6435		E-MAIL ADDRESS tkurfman@aol.com	
ADDRESS PO Box 24206		CITY Blue Springs	STATE MO	ZIP CODE 64013	
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 checked="" 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 checked="" 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 checked="" 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 checked="" 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 Jim Jackson, Jr, PE		TELEPHONE NUMBER WITH AREA CODE 573-873-3898		E-MAIL ADDRESS jimjacksonjr@charter.net	
ADDRESS 83 Oak Tree Road		CITY Camdenton	STATE MO	ZIP CODE 65020	
<b>7.0 APPLICATION FEE</b>					
<input type="checkbox"/> CHECK NUMBER <input type="checkbox"/> JETPAY CONFIRMATION NUMBER					
<b>8.0 PROJECT OWNER:</b> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.					
PROJECT OWNER SIGNATURE					
PRINTED NAME				DATE	
TITLE OR CORPORATE POSITION		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS	
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>					