

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



**CONSTRUCTION PERMIT**

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

Liberty Utilities (Missouri Water) LLC  
703 W. Olive St.  
Aurora, MO 65605

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.

January 13, 2021  
Effective Date

January 12, 2023  
Expiration Date

  
Edward B. Galbraith, Director, Division of Environmental Quality

  
Chris Wieberg, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

The scope of the project comprises the installation of a Triplepoint NitrOx system to conduct nutrient removal. A two tank NitrOx system will be installed with a submersible heating element, four aerators and two blowers. This unit will be installed downstream of the 3 cell lagoons and upstream of the ultraviolet disinfection system.

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 signed and sealed by Strickland Engineering 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 Southeast Regional Office per 10 CSR 20-7.015(9)(G).

5. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.
6. 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.
7. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the Department's ePermitting system available online at [dnr.mo.gov/env/wpp/epermit/help.htm](http://dnr.mo.gov/env/wpp/epermit/help.htm). See [dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm](http://dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm) for more information.
8. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department's Water Protection Program at 573-751-1300 for more information. See [dnr.mo.gov/env/wpp/401/](http://dnr.mo.gov/env/wpp/401/) for more information.
9. 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)
  - Unless another distance is determined by the Missouri Geological Survey or by the department's Public Drinking Water Branch, the minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300'). 10 CSR 20-8.140 (2) (C) 1.
  - 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

- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140 (2) (D)
- Disinfection and dechlorination, when used, shall be provided during all power outages. 10 CSR 20-8.140 (7) (A) 2.
- Moving Bed Bioreactor (MBBR). A MBBR secondary treatment system shall provide upstream preliminary treatment units capable of—
  - Screening to reduce pass-through and suspended solids; 10 CSR 20-8.180 (8)(A)
  - Grit removal; 10 CSR 20-8.180 (8)(B) and
  - Oil and grease removal. 10 CSR 20-8.180 (8)(C)

10. Upon completion of construction:

- A. Liberty Utilities LLC will become the continuing authority for operation and maintenance of these facilities;
- B. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications; and
- C. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N). When the facility applies for their next operating permit renewal, they will be expected to include an updated facility description on their application.

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

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

The purpose of the permitted construction project is to meet final effluent limits for ammonia as nitrogen that became effective on June 1, 2019. The NitrOx system is being installed to address these limits.

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

The wastewater treatment system was originally constructed in 1974 and consists of a 3-cell facultative lagoon. A NitrOx system and design flow increase from 0.04 MGD to 0.075 MGD are discussed in an antidegradation review and facility plan. A NitrOx system is permitted as an upgrade project to meet ammonia as nitrogen effluent limits.

The Cape Rock Village and Tanglewood Subdivision WWTF is located at 0.02 miles NW of the intersection of Breezie Lane and Hilltop Lane, Cape Girardeau, in Cape

Girardeau County, Missouri. The facility has a average design flow of 75,000 gpd and serves a hydraulic population equivalent of approximately 750 people.

### **3. COMPLIANCE PARAMETERS**

The permitted project is required to meet final effluent limits for ammonia as nitrogen (April 1 – Sep 30) of 1.5 mg/L Daily Maximum with 0.6 mg/L as Monthly Average and ammonia as nitrogen (Oct 1 – March 31) of 4.0 mg/L Daily Maximum with 1.6 mg/L Monthly Average as established in the Antidegradation review dated January 4, 2019.

The following effluent limits will be applicable to the facility:

Parameter	Units	Daily Maximum	Weekly Average	Monthly Average
Flow	MGD	*		*
Biochemical Oxygen Demand <sub>5</sub>	mg/L		35	23
Total Suspended Solids	mg/L		45	30
pH	SU	6.5-9.0		6.5-9.0
Ammonia as N (April 1 – Sept 30)	mg/L	1.5		0.6
Ammonia as N (Oct 1 – March 31)	mg/L	4.0		1.6
Escherichia Coloform (E. Coli)**	#/100mL	1030		206

\* Monitoring Limits Only

\*\* The monthly and weekly average for E.coli shall be reported 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).

### **4. ANTIDEGRADATION**

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated January 4, 2019, due to the facility expansion. See **APPENDIX – ANTIDEGRADATION**.

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

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

- Three Cell Lagoon – The influent is pumped into the first lagoon cell by an existing pump station on the treatment plant site. The first lagoon cell is aerated and has a surface area of 14,588 sf. The second lagoon cell has a surface area of 48,498 sf and the third cell has an area of 14,516 sf.

- Components are designed for a Population Equivalent of 750 based on hydraulic loading to the system. Flow meters were installed in 2012 that measure the flow from the pump station. The meters revealed an actual average daily flow of approximately 64,600 gpd for the year of 2016. The facility is upgrading to increase the permitted design flow and construct a NitrOx System.
- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis.
  - Electromagnetic Meter – An effluent electromagnetic flow meter shall measure the secondary treated wastewater prior to discharge at Outfall No. 001.
- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
  - Non-Contact Ultraviolet (UV) – Enaqua Model M4 - A closed channel, gravity flow, low pressure high intensity UV non-contact disinfection system capable of treating an average flow of 75,000 gpd and a peak flow of 150,000 gpd while delivering a minimum UV intensity at end of lamp life of 30 mJ/cm<sup>2</sup> in an effluent with 45% UV transmission. Expected ultraviolet transmissivity is 65% or greater. The water to be disinfected must have a 30-day average BOD <30 mg/L and Suspended solids <30 mg/L. The enclosed UV system consists of a maximum of 8 UV lamps per stage and a maximum of 2 water tubes. Disinfected effluent flows by gravity through flow measurement equipment and to Outfall No. 001.

**Construction will cover the following items:**

- Triplepoint Water Technologies, LLC NitrOx<sup>TM</sup> – The lagoon treated effluent will flow by gravity to the NitrOx<sup>TM</sup> system. The NitrOx<sup>TM</sup> system is capable of treating a design average flow of 75,000 gpd and a peak daily flow of 200,000 gpd. The system is composed of two tanks with each approximately 15 ft x 7 ft x 13 ft with a sidewater depth of 10 ft. Total volume of the two tanks is 12,118 gallons. The average flow hydraulic retention time is 3.9 hours and the peak flow hydraulic retention time is 1.5 hours. A floating insulating cover shall be installed in each tank. An immersion tank heater will be installed to maintain a minimum wastewater temperature of 5°C. Aeration is accomplished by means of two tri-lobe positive displacement blowers each capable of supplying 148 scfm with 5.2 HP motors. The effluent from the NitrOx<sup>TM</sup> will flow by gravity to the ultraviolet disinfection unit permitted for construction in CP0002110 for disinfection prior to discharge.

## **6. OPERATING PERMIT**

Operating permit MO-0056332 will require a modification to reflect the construction activities. An operating permit modification was submitted with the construction

permit application. The modified Cape Rock Village and Tanglewood Subdivision WWTF operating permit, was public noticed from December 4, 2020 to January 4, 2021. This operating permit modification changes the facility description with the antidegradation review incorporated with upgrades of the NitrOx System and UV disinfection system. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued.

## **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>

Steven Hamm, P.E.  
Engineering Section  
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Cailie Carlile, P.E.  
Engineering Section  
[cailie.carlile@dnr.mo.gov](mailto:cailie.carlile@dnr.mo.gov)

## **APPENDIX**

- **Antidegradation**

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

## **Water Quality and Antidegradation Review**

*For the Protection of Water Quality  
and Determination of Effluent Limits for Discharge to  
Tributary to Juden Creek*

*by  
Cape Rock Village and Tanglewood Subdivision Wastewater  
Treatment Facility*



December, 2018



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## 1. FACILITY INFORMATION

FACILITY NAME: Cape Rock Village and Tanglewood Subdivision WWTF NPDES #: MO-0056332

### FACILITY TYPE/DESCRIPTION:

FACILITY TYPE: NON-POTW – Residential Subdivision – SIC #4952

FACILITY DESCRIPTION: The current permitted design flow is 0.04 MGD. The facility currently has an aerated lagoon. The proposed design flow, with the installation of a NitrOx system and UV disinfection, will be 0.075 MGD.

COUNTY: Cape Girardeau UTM COORDINATES: X= 807317 / Y=4139867  
12- DIGIT HUC: 07140105-0502 LEGAL DESCRIPTION: SE ¼, SE ¼, Sec. 18, T31N, R14E  
EDU\*: Ozark/Apple/Joachim ECOREGION: Ozark Border

\* - Ecological Drainage Unit

## 2. 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 which 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.

### 2.1. WATER QUALITY HISTORY:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.11	Secondary	Tributary to Juden Creek	Directly Discharges
			Juden Creek	0.17

## 3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Tributary to Juden Creek	NA	NA	0.0	0.0	0.0	General Criteria
Juden Creek	C	3960	-	-	-	AQL, HHP, IRR, LWW, SCR, WBC(B)

\*\* Irrigation (IRR), Livestock & Wildlife Protection (LWP), Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

RECEIVING WATER BODY SEGMENT #1: Tributary to Juden Creek

Upper end segment\* UTM coordinates: X= 807317/ Y= 4139867 (outfall)

Lower end segment\* UTM coordinates: X= 807204/ Y= 4139615 (confluence with Juden Creek?)

\* Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.



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#### 4. GENERAL COMMENTS

Strickland Engineering, prepared, on behalf of Liberty Utilities LLC, the Cape Rock Village and Tanglewood Subdivision *Antidegradation Review Report* dated April 6, 2018.

Applicant elected to determine that discharge of all pollutants of concern (POC) is non-degrading or insignificant to the receiving stream. This analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant in the submitted report and summary forms in Appendix B was used to develop this review document.

A Geohydrological Evaluation was not submitted for this facility upgrade. The stream is gaining for discharge purposes (Appendix A: Map).

A Missouri Department of Conservation Natural Heritage Review Report was obtained by the applicant; MDC found no record of wildlife preserves, critical habitats, or state or federal endangered-list species records within one mile of the site.

#### 5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the Cape Rock Village and Tanglewood Subdivision *Antidegradation Review Report* dated April 6, 2018.

##### 5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B). 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). Tier 2 is assumed for all POCs; however, tier determinations were not necessary with maintenance of mass loading determinations (see Appendix B).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
BOD <sub>5</sub> /DO	*	Insignificant	
Total Suspended Solids (TSS)	**	Insignificant	
Ammonia as N	*	Insignificant	
pH	***	Insignificant	Permit limits applied
Bacteria/ <i>Escherichia coli</i> ( <i>E. coli</i> )	*	Insignificant	Permit limits applied

\*Tier determination not possible with the demonstration of mass loading maintenance. Tier determination not possible: \*\* No in-stream standards for these parameters. \*\*\* Standards for these parameters are ranges.

The following Antidegradation Review Summary attachments in Appendix B were used by the applicant: For pollutants of concern, the attachments are:

☒ Attachment B, Tier 2 with minimal degradation.

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## 5.2. EXISTING WATER QUALITY

No existing water quality data was submitted. POCs were considered to be Tier 2 and non-degrading in the absence of existing water quality.

## 5.3. NO DISCHARGE EVALUATION

According to 10 CSR 20-6.010 (4)(D), reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no discharge facility. Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required. For this reason, the no discharge evaluation should be completed during the submittal of engineering report or facility plan for the purpose of obtaining a construction permit.

## 5.4. LOSING STREAM ALTERNATIVE DISCHARGE LOCATION

Under 10 CSR 20-7.015(4) (A), *discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.*

The facility does not discharge to a losing stream segment or will not discharge within 2 miles of a losing stream segment.

## 5.5. DEMONSTRATION OF INSIGNIFICANCE

In Section II.A of the *Missouri's Antidegradation Rule and Implementation Procedure*, a demonstration of insignificance of the discharge requires the applicant to show a reduction, or maintenance of loading, i.e., no change in ambient water quality concentrations in the receiving waters. As demonstrated in Cape Rock Village and Tanglewood Subdivision *Antidegradation Review Report* dated April 6, 2018, Table 2 below summarizes the results of current loading based on the current permit concentrations and proposed loadings based on the proposed permit concentrations.

Table 2. Net Change in Loadings Based upon Current and Proposed Permit Limits.

POLLUTANTS OF CONCERN	CURRENT WEEKLY AVERAGE OR MAXIMUM DAILY LIMIT (MG/L)	PROPOSED MAXIMUM DAILY LIMIT (NOTE 1) (MG/L)	CURRENT LOADING (LBS/DAY)	PROPOSED LOADING (LBS/DAY)	NET CHANGE (LBS/DAY)
BOD5	65	35	15	14.4	-0.61
Total Suspended Solids (TSS)	120	45	40	28.2	-11.88
Ammonia (Summer)	3.6	1.5	1.2	0.4	-0.8
Ammonia (Winter)	7.5	4.0	2.5	2.5	0

\*WQBEL=water quality based effluent limit. \*\*See Derivation and Discussion of Limits, Section 10.

\*\*\*Value is in the current permit, rather than the expired permit. AWL = average weekly limit.

Note 1—Except for TSS and BOD, the proposed effluent limits that were provided by applicant were determined by using the *ratio of current flow (0.04 MGD) to proposed design flow or 0.53; thus 53% of the current limit is applied as the proposed limit.*



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Current design flow (Qd) = 5.25 MGD  
Mass conversion -- 1 mg/L = 8.34 lbs/million gallons  
Wasteload Allocation (WLA) = maximum daily or weekly average

Existing Load (lbs/day) = Mass conversion \* WLA \* Qd  
**Example:** 8.34 (lbs/MG)/(mg/L) \* 1 mg/L \* 5.25 MGD = 43.8 lbs/day

#### 5.6. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required. Thus, the Tier 2 Review is not required.

#### 6. GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDEGRADATION REVIEW

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for 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 supersedes 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 Design Guides, 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.

#### 7. MIXING CONSIDERATIONS

**Mixing Zone (MZ):** Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)].

**Zone of Initial Dilution (ZID):** Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(b)]

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## 8. PERMIT LIMITS AND MONITORING INFORMATION

WASTELOAD ALLOCATION STUDY CONDUCTED (Y OR N): ☐ N USE ATTAINABILITY ANALYSIS CONDUCTED (Y OR N): ☐ N WHOLE BODY CONTACT USE RETAINED (Y OR N): ☒ Y

### OUTFALL #001

WET TEST (Y OR N): ☐ N FREQUENCY: N/A AEC: N/A METHOD: N/A

TABLE 3. EFFLUENT LIMITS FOR OUTFALL #001

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 2)	MONITORING FREQUENCY
FLOW	MGD	*		*		ONCE/QUARTER
BOD <sub>5</sub> ***	MG/L		35	23	NDEL	ONCE/QUARTER
TSS	MG/L		45	30	NDEL	ONCE/QUARTER
pH	SU	6.5 – 9.0		6.5 – 9.0	FSR	ONCE/QUARTER
AMMONIA AS N (APRIL 1 – SEPT 30)	MG/L	1.5		0.6	NDEL	ONCE/QUARTER
AMMONIA AS N (OCT 1 – MAR 31)	MG/L	4.0		1.6	NDEL	ONCE/QUARTER
ESCHERICHIA COLIFORM (E. COLI)	NOTE 1	1030**		206**	FSR	ONCE/QUARTER

NOTE 1 – COLONIES/100 ML

NOTE 2 – WATER QUALITY-BASED EFFLUENT LIMITATION – WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT – MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT – PEL; OR TECHNOLOGY-BASED EFFLUENT LIMIT – TBEL; OR NO DEGRADATION EFFLUENT LIMIT – NDEL; OR FEDERAL/STATE REGULATION – FSR; OR NOT APPLICABLE – N/A. ALSO, PLEASE SEE THE GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.

\* Monitoring requirements only.

\*\* The Monthly and Weekly Average for *E. coli* shall be reported 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).

\*\*\* This facility is 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.

## 9. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

## 10. DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations and limits were calculated using two methods:

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

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where: C = downstream concentration

Cs = upstream concentration

Qs = upstream flow

Ce = effluent concentration

Qe = effluent flow



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Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

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).

Chronic wasteload allocations (WLA<sub>c</sub>) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and upstream stream flow without mixing considerations. Acute wasteload allocations are only determined in the absence of applicable chronic criteria.

#### 10.1. OUTFALL #001 – MAIN FACILITY OUTFALL

#### 10.2. 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 23 mg/L monthly average, 35 mg/L average weekly. The technology-based secondary limitations at 10 CSR 20-7.015 (8) of 30 mg/L monthly and 45 mg/L average weekly are less protective of water quality standards than the no degradation expansion limitations in the table below. The table below shows that the expanded loading will be reduced as compared to the current permitted loading. This demonstration of insignificance satisfies the requirements of the AIP. These limitations are non-degrading and protective of existing water quality.

Parameter	Limit	WLA (mg/L)	(LBS/MG)/(mg/L)	Current Qd MGD	Current Load (lbs/day)	Expanded Qd MGD	Proposed Load (lbs/day)	Expansion Limit (mg/L)
BOD	Monthly	45	8.34	0.04	15.0	0.075	14.4	23
	Weekly	65	8.34	0.04	21.7	0.075	21.9	35

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

- **Total Suspended Solids (TSS).** 30 mg/L monthly average, 45 mg/L average weekly limit.

Parameter	Limit	WLA (mg/L)	(LBS/MG)/(mg/L)	Current Qd MGD	Current Load (lbs/day)	Expanded Qd MGD	Proposed Load (lbs/day)	Expansion limit (mg/L)
TSS	Monthly	80	8.34	0.04	26.7	0.075	18.8	30
	Weekly	120	8.34	0.04	40.0	0.075	28.1	45

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

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- **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 due to the classification of the receiving stream, therefore the water quality standard must be met at the outfall.
- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

#### **No degradation Limitation Calculations**

The following tables are presented because the facility was recently renewed with lower ammonia limitations and, secondly, to give the applicant-provided antidegradation review loading calculations consideration. The limitations are more stringent and use correct low flow values.

Parameter	Limit	WLA (mg/L)	(LBS/MG)/(mg/L)	Current Qd MGD	Current Load (lbs/day)	Expanded Qd MGD	Expansion Limit (mg/L)
Ammonia Summer	Monthly	1.4	8.34	0.04	0.5	0.075	0.6
	Maximum	3.6	8.34	0.04	1.2	0.075	1.5
Ammonia Winter	Monthly	2.9	8.34	0.04	1.0	0.075	1.6
	Maximum	7.5	8.34	0.04	2.5	0.075	4.0

#### **No Degradation Expansion Limitations**

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	1.5	0.6
Winter	4.0	1.6

**Classified Streams:** 10 CSR 20-7.015 (9)(B)1.A.

- **Escherichia coli (E. coli)**. Monthly average of 206 per 100 mL as a geometric mean and Daily Maximum of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d).

For facilities less than 100,000 gpd: Per the effluent regulations the *E. coli* sampling/monitoring frequency 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). The weekly average requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Please see **GENERAL ASSUMPTIONS OF THE WQAR #7**



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#### **11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION**

The proposed facility discharge will result in no degradation of the segment identified in the Juden Creek. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. 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.

Reviewer: Shawn Abrahamsen

Date: 12/14/2018

Unit Chief: John Rustige, P.E.

JR

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Appendix A: Map of Discharge Location



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## Appendix B: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant. Department staff determined that changes must be made to the information contained within these attachments. The following were modified and can be found within the Department's WQAR:

### 1) Attachment A: Antidegradation Application.

MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM WATER QUALITY REVIEW ASSISTANCE ANTIDEGRADATION REVIEW REQUEST PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS		RECEIVED DEC 6 2018 Water Protection Program		For Office Use Only	
TYPE OF PROJECT <input type="checkbox"/> Grant <input type="checkbox"/> SRF Loan <input checked="" type="checkbox"/> All Other Projects		CHECK NUMBER 12-4060		DATE RECEIVED 12-07-18	
REQUESTER Michael Montgomery		TELEPHONE NUMBER WITH AREA CODE (573) 243-4080		FEE SUBMITTED \$1,000.00	
PERMITTED FACILITY NAME Cape Rock Village & Tanglewood Subdivision		NCP NUMBER (IF APPLICABLE)			
COUNTY Cape Girardeau		SEC. NAME CODE 4952			
<b>REASON FOR REQUEST</b>					
<input type="checkbox"/> New Discharge (See Instruction #9) <input checked="" type="checkbox"/> Upgrade (No expansion) (See A/P) <input type="checkbox"/> Expansion <input type="checkbox"/> GAPP or Study Review					
DESCRIPTION OF PROPOSED ACTIVITY The wastewater lagoon improvements include increasing the permitted flow and improving effluent water quality set forth in the existing operating permit's schedule of compliance. The effluent quality will be improved through the construction and implementation of a NitrOx moving bed biotm reactor (MBBR) and ultraviolet (UV) disinfection system.					
<b>FACILITY INFORMATION</b>					
METHOD OF BACTERIA COMPLIANCE <input type="checkbox"/> Chlorine Disinfection <input checked="" type="checkbox"/> Ultraviolet Disinfection <input type="checkbox"/> Ozone <input type="checkbox"/> Not Applicable					
WATER QUALITY ISSUE The upgrade shall include the addition of UV disinfection.					
*Water quality issues include: effluent limit compliance issues, notices of violation, water body beneficial uses not attained or supported, etc.					
OUTFALL	LOCATION (UTM OR LAT/LONG OR LEGAL DESCRIPTION)	MAPPED (CHECK)	RECEIVING WATER BODY <sup>3</sup>		
#001	UTM: X=807317, Y=4138867	<input checked="" type="checkbox"/>	Tributary to Judens Creek		
Please attach topographic map (See: <a href="http://www.dnr.mo.gov/internet/mapviewer/">www.dnr.mo.gov/internet/mapviewer/</a> ) with outfall locations clearly marked. For additional outfalls, attach a separate form.					
Please see general instructions for discharges to streams.					
OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE		EFFLUENT TYPES*	
#001	0.075	Aerated Lagoon / MBBR / UV		Domestic Wastewater	
* Describe predominating character of effluent. Example: Domestic Wastewater, Municipal Wastewater, Industrial Wastewater, Storm water, Mining Leachate, etc. ** If expansion, indicate new design flow.					
See General Instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream.					
APPLICANT Michael Montgomery		DATE 12/3/2018		E-MAIL ADDRESS mmontgomery@stricklandengineering.com	
APPLICANT SIGNED (check all that apply)		FEE (573) 243-4080		Submit request to Missouri Department of Natural Resources, Water Protection Program, ATTN: dPCB Engineering Section P.O. Box 176 Jefferson City, MO 65103-0176 Telephone: 573-751-1300 Fax: 573-522-9600	
<input type="checkbox"/> Fee: See Instructions					
<input type="checkbox"/> Attachment A - Significant Degradation					
<input type="checkbox"/> Attachment B - Minimal Degradation					
<input type="checkbox"/> Attachment C - Temporary degradation					
<input type="checkbox"/> Attachment D - Tier 1 Review					
<input type="checkbox"/> No Degradation Evaluation					
<input type="checkbox"/> Heritage Review Determination. See Instruction #6.					
<input type="checkbox"/> Geohydrologic Evaluation. See Instruction #6.					
<input type="checkbox"/> Tier Analysis for minimal degradation (see Page 3, Tier 2 Reviews).					
<input type="checkbox"/> Quality Assurance Project Plan.					
<input type="checkbox"/> Time of travel study (see Instruction #3) or model (see Instruction #2).					

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MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH ANTIDEGRADATION REVIEW SUMMARY FOR PUBLIC NOTICE ATTACHMENT B: TIER 2 - MINIMAL DEGRADATION			
<b>1. FACILITY</b>			
Name: Cape Rock Village & Tanglewood Subdivision		Telephone Number with Area Code: (417) 229-8018	
Address (Physical): Hibbs Lane	City: Cape Girardeau	State: MO	Zip Code: 63701
<b>2. OWNER</b>			
Name and Official Title: Liberty Utilities (Missouri Water) LLC			
Address: 110 Foster St.	City: Noel	State: MO	Zip Code: 64854
Telephone Number with Area Code: (417) 229-8018	E-mail Address: gaul.ca@noel.libertyutilities.com		
<b>3. CONTINUING AUTHORITY</b> The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at <a href="http://www.sos.mo.gov/cheater/document/10csr20-6-010-3a.pdf">www.sos.mo.gov/cheater/document/10csr20-6-010-3a.pdf</a>			
Name and Official Title: Same as Owner			
Address: Same as Owner	City: Noel	State: MO	Zip Code: 64854
Telephone Number with Area Code: (417) 229-8018	E-mail Address: gaul.ca@noel.libertyutilities.com		
<b>4. RECEIVING WATER BODY SEGMENT #1</b>			
Name: Tributary to Judens Creek			
4.1 UPPER END OF SEGMENT (Location of discharge) UTM _____ OR Lat. 27.254813° Long. -89.530724°			
4.2 LOWER END OF SEGMENT UTM _____ OR Lat. 37.348837° Long. -89.529879°			
Per the Missouri Antidegradation Rule and Implementation Procedures, as RFP, the definition of a segment, "a segment is a section of water that is bounded, at a minimum, by significant existing sources and confluences with other significant water bodies."			
<b>5. WATER BODY SEGMENT #2 (IF APPLICABLE. Use another form if a third segment is needed)</b>			
Name: _____			
5.1 Upper end of segment UTM _____ OR Lat. _____ Long. _____			
5.2 Lower end of segment UTM _____ OR Lat. _____ Long. _____			
<b>6. WET WEATHER ANTICIPATIONS</b>			
If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(e)(4). Attach the feasibility analysis to this report.			
What is the Wet Weather Flow Peaking Factor in relation to design flow? <u>4</u>			
Wet Weather Design Summary: _____			
<b>7. OIL AND GREASE</b>			
Is this a publicly owned treatment works, or POTW, restaurant, school or other domestic wastewater treatment facility with oil and grease as a pollutant of concern? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
In accordance with 10 CSR 20-7.031(3)(B), waters shall be free from oil, silt and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. In accordance with 10 CSR 20-7.031 Table A, oil and grease has a chronic toxicity of 10 mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/L and 10 mg/L, respectively).			

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<b>8. 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 A of 10 CSR 20-7.031?			
<input type="checkbox"/> Yes <input type="checkbox"/> No			
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.			
<b>9. EXISTING WATER QUALITY DATA OR MODEL SUMMARY</b>			
Obtaining existing water quality is possible by three methods according to the Antidegradation Implementation Procedure, Section 8.A.1: (1) Using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) Collecting water quality data approved by the Missouri Department of Natural Resources methodology or (3) Using an appropriate water quality model. QAPPs must be submitted to the department for approval in advance (six months) of the proposed activity. Provide all corresponding data and reports that were approved by the department's Water Protection Program.			
Date that existing water quality data was provided by the Water Protection Program:			
Tier Analysis submitted with antidegradation review report (see AIP Section II 1.d., Page 21):			
Approval date of the QAPP by the Water Protection Program:			
Approval date of the project sampling plan by the Water Protection Program:			
Approval date of the data collected for all appropriate pollutants of concern by the Water Protection Program:			
Comments/Discussion:			
<b>10. ASSIMILATIVE CAPACITY / LOAD REDUCTION TABLE</b>			
Determining the facility assimilative capacity, or FAC, and the segment assimilative capacity, or SAC for each pollutant of concern is explained in detail in the Antidegradation Implementation Procedure, Section 8.A.3, and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure, Section 8.A. Provide all calculations in the Antidegradation Review Report.			
Pollutant of Concern	Facility Assimilative Capacity OR Current Load (lb/day)	New Load (lb/day)	Percent of Facility Assimilative Capacity OR Percent Load Reduction (%)
BOD5	15.0	14.4	4.0% Reduction
TSS	26.7	18.8	25.6% Reduction
Ammonia (summer)	0.47	.4	14.9% Reduction
Ammonia (winter)	0.97	.97	0%
Pollutant of Concern	Water Body Segment #1 SAC (like another form if a second segment is needed)	Cumulative Net Increase in Load	Cumulative % of Water Body Segment #1 SAC
BOD5	Tributary to Judens Creek	-0.6	4.0% Reduction
TSS	Tributary to Judens Creek	-7.9	25.6% Reduction
Ammonia (summer)	Tributary to Judens Creek	-0.07	14.9% Reduction
Ammonia (winter)	Tributary to Judens Creek	0	0%
Assimilative capacity/loading reduction summary All cumulative net load is a 0 lb/day			
Is degradation considered minimal for all pollutants of concern? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 10 percent of the SAC according to the Antidegradation Implementation Procedure, Section 8.A.3. If yes, an alternative analysis and a social and economic impact analysis are not required.			
Comments/Discussion:			



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11. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS				
What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:				
Pollutants of Concern*	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	mg/L		23	34.5
TSS	mg/L		30	45
Ammonia (summer)	mg/L		8	1.5
Ammonia (winter)	mg/L		1.55	4.0
These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest secondary and regulatory requirements.				
*A Tier Analysis must be submitted to demonstrate that the POCs are Tier 2 with minimal degradation.				
12. PROPOSED PROJECT SUMMARY				
The purpose of this project is to meet the effluent quality parameters set forth in the Schedule of Compliance, per the Facility's Operating Permit. The project includes: increasing permitted flows, installing ammonia treatment, and installing UV disinfection.				
Attach the Antidegradation Review Report and all supporting documentation, including minimal degradation calculations.				
<b>CONSULTANT:</b> I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulations.				
Signature: <i>Brian Strickland</i>			DATE: 4/25/18	
NAME AND OFFICIAL TITLE/LICENSE # Brian Strickland, P.E. / License No. E-30135			COMPANY NAME Strickland Engineering	
ADDRESS 113 W. Main Street, Suite 1			CITY Jackson	STATE MO
TELEPHONE NUMBER WITH AREA CODE (573) 243-4080			E-MAIL ADDRESS bstrick@stricklandengineering.com	
<b>OWNER:</b> I have read and reviewed the prepared documents and agree with this submittal.				
Signature: <i>[Signature]</i>			DATE: 4/25/18	
<b>CONTINUING AUTHORITY:</b> I have read and reviewed the prepared documents and agree with this submittal.				
Signature: _____			DATE: _____	

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MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
**ANTIDEGRADEATION REVIEW SUMMARY**  
**TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY**

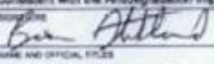
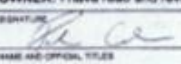
<b>1. FACILITY</b>	
Name Cape Rock Village & Tanglewood Subdivision	
Telephone Number (with area code) (417) 229-6016	
Address (Physical) Hilltop Lane	City Cape Girardeau
State MO	Zip Code 63701
<b>2. RECEIVING WATER BODY SEGMENT #1</b>	
Name Tributary to Judens Creek	
3.1 UPPER END OF SEGMENT (Location of discharge) UTM _____ OR Lat 37.354813° Long -89.530724°	
3.2 LOWER END OF SEGMENT UTM _____ OR Lat 37.349837° Long -89.526379°	
<small>Per the Missouri Antidegradation Rule and Implementation Procedure, or 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."</small>	
<b>3. WATER BODY SEGMENT #2 (IF APPLICABLE)</b>	
Name _____	
3.1 UPPER END OF SEGMENT UTM _____ OR Lat _____ Long _____	
3.2 LOWER END OF SEGMENT UTM _____ OR Lat _____ Long _____	
<b>4. WATER BODY SEGMENT #3 (IF APPLICABLE)</b>	
Name _____	
4.1 UPPER END OF SEGMENT UTM _____ OR Lat _____ Long _____	
4.2 LOWER END OF SEGMENT UTM _____ OR Lat _____ Long _____	
<b>5. PROJECT INFORMATION</b>	
Is the receiving water body an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<small>In Tables D and E of 10 CSR 20-7.031, Outstanding National Resource Waters and Outstanding State Resource Water are listed. Per the Antidegradation Implementation Procedure Section 1.B.3, "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation." Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.</small>	
Will the proposed discharge of all pollutants of concern, or POCs, result in no net increase in the ambient water quality concentration of the receiving water after mixing? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<small>If yes, submit a summary table showing the levels of each pollutant of concern before and after the proposed discharge in the receiving water and then complete Attachment B for the first downstream classified water body segment.</small>	
Will the discharge result in temporary degradation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<small>If yes, complete Attachment C.</small>	
Has the project been determined as non-degrading? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<small>If yes, complete No Degradation Evaluation - Conclusion of Antidegradation Review form.</small>	
<small>Submit with the appropriate Construction Permit Application as no antidegradation review is required.</small>	
<b>If yes to one of the above questions, skip to Section 8 - Wet Weather.</b>	

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<b>6. EXISTING WATER QUALITY DATA OR MODEL SUMMARY</b>		
<p>Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section 3.A.1. (1) using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) collecting water quality data by approval the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Water Quality Monitoring and Assessment Section.</p>		
<p>Date existing water quality data was provided by the Water Quality Monitoring and Assessment Section:</p>		
<p>Approval date of the QAPP by the Water Quality Monitoring and Assessment Section:</p>		
<p>Approval date of the project sampling plan by the Water Quality Monitoring and Assessment Section:</p>		
<p>Approval date of the data collected for all appropriate pollutants of concern by the Water Quality Monitoring and Assessment Section:</p>		
<p>Comments/Discussion:</p>		
<b>7. POLLUTANTS OF CONCERN AND TIER DETERMINATION(S)</b>		
<p>Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section 3.5. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (3).</p>		
<b>Water Body Segment One</b>		
<b>Pollutants of Concern and Tier Determination(s)</b>		
Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
	BOOD	
	TSS	
	Ammonia	
<p>Note: Add an asterisk to items that you only assume are Tier 2 with significant degradation.</p>		
<b>Water Body Segment Two</b>		
<b>Pollutants of Concern and Tier Determination(s)</b>		
Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
<ul style="list-style-type: none"> <li>• For pollutants of concern that are Tier 2 with significant degradation, complete Attachment A.</li> <li>• For pollutants of concern that are Tier 2 with minimal degradation, complete Attachment B.</li> <li>• For pollutants of concern that are Tier 1, complete Attachment D. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment.</li> </ul>		
<b>8. WET WEATHER ANTICIPATIONS</b>		
<p>If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.</p>		
<p>What is the Wet Weather Flow Peaking Factor in relation to design flow?</p>		
<p>Wet Weather Design Summary:</p>		

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9. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS				
These are the proposed effluents of concern and their respective effluent limits that the wastewater treatment system will comply with:				
Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	mg/L		20	34.5
TSS	mg/L		30	45
Dissolved Oxygen				
Ammonia	mg/L		0.6 Summer; 1.55 Winter	1.5 Summer; 4.0 Winter
Bacteria (E. Coli)				
These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest statutory and regulatory requirements.				
Attach the Antidegradation Review report and all supporting documentation.				
<b>CONSULTANT:</b> I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulation.				
SIGNATURE 			DATE 4/25/18	
NAME AND OFFICIAL TITLE Brian Strickland, P.E.				
COMPANY NAME Strickland Engineering, LLC				
ADDRESS 113 W. Main Street, Suite 1		CITY JACKSON	STATE MO	ZIP CODE 63755
TELEPHONE NUMBER WITH AREA CODE (573) 243-4080		E-MAIL ADDRESS bstrick@stricklandengineering.com		
<b>OWNER:</b> I have read and reviewed the prepared documents and agree with this submittal.				
SIGNATURE 			DATE 4/26/18	
NAME AND OFFICIAL TITLE Liberty Utilities (Missouri Water) LLC				
ADDRESS 110 Foster St.		CITY Noel	STATE MO	ZIP CODE 64854
TELEPHONE NUMBER WITH AREA CODE (417) 229-8018		E-MAIL ADDRESS paul.carlson@libertyutilities.com		
<b>CONTINUING AUTHORITY:</b> Continuing Authority is the permanent organization that will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at <a href="http://www.sos.mo.gov/csr/rules/csrcontent/10csm16c20-6a.pdf">www.sos.mo.gov/csr/rules/csrcontent/10csm16c20-6a.pdf</a> .				
I have read and reviewed the prepared documents and agree with this submittal.				
SIGNATURE			DATE	
NAME AND OFFICIAL TITLE Liberty Utilities (Missouri Water) LLC				
ADDRESS 110 Foster St.		CITY Noel	STATE MO	ZIP CODE 64854
TELEPHONE NUMBER WITH AREA CODE (417) 229-8018		E-MAIL ADDRESS paul.carlson@libertyutilities.com		

Cape Rock Village and Tanglewood Subdivision WWTF  
12/12/2018  
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NOV 29 2018  
Water Protection Program

 **MISSOURI DEPARTMENT OF NATURAL RESOURCES**  
**WATER PROTECTION PROGRAM**  
**FACILITY PLAN OR ENGINEERING REPORT REVIEW REQUEST**

**1.0 REASON FOR REQUEST:**

☒ Facility plan\* for a wastewater treatment facility (WWTF) or components thereof for facilities with a design flow of 22,500 gpd or greater or for a department funded project.

☐ Engineering report\* for a nondepartment funded wastewater treatment facility or components thereof for facilities with a design flow less than 22,500 gpd.

☐ Engineering report\* for nondepartment funded projects limited to collection system improvements only.

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

**2.0 REQUEST INFORMATION**

2.1 Is this a federal/state funded project? ☐ Yes ☒ No  
Funding Agency: ☐ MoDNR ☐ USOA-RD ☐ CDBG ☐ Other: \_\_\_\_\_; Project #: \_\_\_\_\_

2.2 For new or expanded discharges, has the Missouri Department of Natural Resources approved the proposed project's antidegradation review? ☐ Yes Date of approval: \_\_\_\_\_ ☐ N/A

2.3 Is the facility currently under enforcement with the department or the U.S. Environmental Protection Agency? ☐ Yes ☒ No

2.4 Is the facility plan or engineering report required for submittal by an enforcement agreement or an operating permit schedule of compliance? ☒ Yes ☐ No

2.5 Is an electronic copy of the facility plan or engineering report included in addition to a hard copy? ☒ Yes ☐ No

**3.0 PROJECT INFORMATION**

3.1 NAME OF PROJECT: Cape Rock Village & Tanglewood Subdivision Wastewater Treatment Lagoon Improvements

DATE SUBMITTED: 04/05/2018

PHYSICAL ADDRESS	CITY	STATE	ZIP CODE	COUNTY
HSRop Lane	Cape Girardeau	MO	63701	Cape Girardeau

3.2 PROJECT DESCRIPTION

The wastewater lagoon improvements include increasing the permitted flow and improving effluent water quality set forth in the existing operating permit's schedule of compliance. The effluent quality will be improved through the construction and implementation of a NitrOx moving bed biofilm reactor (MBBR) and ultraviolet (UV) disinfection system.

**3.3 ADDITIONAL INFORMATION**

A. Is a topographic map included in the facility plan or engineering report? ☒ Yes ☐ No

B. [WWTF only] Is a process flow diagram included in the facility plan or engineering report? ☒ Yes ☐ No ☐ N/A

C. [WWTF only] Is a geohydrological evaluation included in the facility plan or engineering report? ☐ Yes ☐ No ☒ N/A

D. [WWTF only] Alternatives analysis included feasibility of no-discharge? ☒ Yes ☐ No ☐ N/A

E. [WWTF only] Alternatives analysis included feasibility of regionalization? ☐ Yes ☐ No ☒ N/A

F. Does the proposed project include innovative or new technology not included in 10 CSR 20-8? ☒ Yes ☐ No  
Technology: Moving Bed Biofilm Reactor (MBBR)

G. Does the proposed project include a deviation from 10 CSR 20-8? ☐ Yes ☒ No  
Deviation request: \_\_\_\_\_

H. [If the project is receiving department SRF funding] Does the proposed project include a sole source request? ☐ Yes ☐ No  
Sole source request: \_\_\_\_\_

3.4 ESTIMATED COST OF THE PREFERRED ALTERNATIVE  
\$ 464,200

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<b>4.0 ENGINEER:</b>			
ENGINEER NAME / COMPANY NAME Brian Strickland, P.E. / Strickland Engineering		TELEPHONE NUMBER WITH AREA CODE (573) 243-6080	
EMAIL ADDRESS bstrick@stricklandengineering.com			
ADDRESS 113 W. Main Street, Suite 1		CITY Jackson	STATE MO
		ZIP CODE 63755	
<b>5.0 CONTINUING AUTHORITY:</b> Permanent organization that will serve as the continuing authority for the operation, maintenance, and modernization of the wastewater system.			
NAME Liberty Utilities (Missouri Water) LLC		TELEPHONE NUMBER WITH AREA CODE (417) 229-8018	
EMAIL ADDRESS paul_carlson@libertyutilities.com			
ADDRESS 110 Foster St.		CITY Noel	STATE MO
		ZIP CODE 64854	
<b>6.0 RECEIVING WASTEWATER TREATMENT FACILITY</b>			
NAME		TELEPHONE NUMBER WITH AREA CODE	
MISSOURI STATE OPERATING PERMIT #		DESIGN AVERAGE FLOW (GPD)	
		RESERVING CAPACITY (GPD)	
<b>7.0 PROJECT OWNER:</b> I hereby certify that I am familiar with the information contained in this form and to the best of my knowledge and belief such information is true, complete, and accurate.			
PROJECT OWNER NAME Liberty Utilities (Missouri Water) LLC		TELEPHONE NUMBER WITH AREA CODE (417) 229-8018	
EMAIL ADDRESS			
ADDRESS 110 Foster St. 703 W. Olive		CITY Noel	STATE MO
		ZIP CODE 64854 65105	
AUTHOR'S SIGNATURE 		TITLE OR CORPORATE POSITION Operation Supervisor	
PRINTED NAME Paul Carlson		DATE 11/12/18	
Mail completed form and any attachments to one of the following:			
For Nondepartment Funded Projects: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM ATTN: ENGINEERING SECTION P.O. BOX 176 JEFFERSON CITY, MO 65102-0176		For Department Funded Projects: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM ATTN: FINANCIAL ASSISTANCE CENTER P.O. BOX 176 JEFFERSON CITY, MO 65102-0176	

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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	CHECK NO.
DATE RECEIVED	

**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: 12/12/18 ☐ N/A
- 1.3 Has the department approved the proposed project's facility plan\*?  
☐ YES Date of Approval: 1/17/19 ☐ 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	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$
2.3 PROJECT DESCRIPTION	
2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION	
2.5 DESIGN INFORMATION A. Current population: _____; Design population: _____ B. Actual Flow: <u>65,000</u> gpd; Design Average Flow: <u>75,000</u> gpd; Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: _____ gpd; Design Wet Weather Event: _____	
2.6 ADDITIONAL INFORMATION A. Is a topographic map attached? <input type="checkbox"/> YES <input type="checkbox"/> NO B. Is a process flow diagram attached? <input type="checkbox"/> YES <input type="checkbox"/> NO	

<b>3.0 WASTEWATER TREATMENT FACILITY</b>				
NAME		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS
ADDRESS (PHYSICAL) 0.02 mi. NW of Intersection of Breezie Ln & Hilltop Ln		CITY	STATE	ZIP CODE COUNTY
Wastewater Treatment Facility: Mo- (Outfall Of )				
3.1 Legal Description: _____ ¼, _____ ¼, _____ ¼, 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: _____				
<b>4.0 PROJECT OWNER</b>				
NAME		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS
ADDRESS		CITY	STATE	ZIP CODE
<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		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS
ADDRESS		CITY	STATE	ZIP CODE
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 type="checkbox"/> N/A				
5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.				
A. Is a copy of the certificate of convenience and necessity included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.				
A. Is a copy of the as-filed restrictions and covenants included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
<b>6.0 ENGINEER</b>				
ENGINEER NAME / COMPANY NAME		TELEPHONE NUMBER WITH AREA CODE		E-MAIL ADDRESS
ADDRESS		CITY	STATE	ZIP CODE
<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>				