

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Young Life
P.O. Box 520
Colorado Springs, CO
80901

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

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

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

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

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

August 3, 2015
Effective Date

August 2, 2016
Expiration Date


Sara Parker Pauley, Director, Department of Natural Resources


John Madras, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed wastewater collection system will consist of a low pressure sewer system, with grinder pumps at each connection, which will carry raw wastewater to the receiving wastewater treatment facility.

This project will include construction and installation of approximately 1,140 linear feet (lf) of 4-inch through 8-inch polyvinyl chloride (PVC) Standard Dimension Ratio (SDR)-35 gravity sewer with two manholes, approximately 5,097 lf of 2-inch through 4-inch high density polyethylene (HDPE) Standard Dimension Ratio (SDR)-11 force mains with cleanouts and air release valves, and all necessary appurtenances to make a complete and usable wastewater collection system to serve an estimated population equivalent of 247 campers and an estimated design average flow of 18,500 gallons per day (gpd).

Fifteen new centrifugal grinder pumping stations with generators or generator plugs will be installed. Seven will be simplex pump stations capable of pumping 1200, 500, 500, 250, 500, 1200, and 250 gpd. Eight (8) will be duplex pump stations capable of pumping 5,800, 2000, 2500, 1200, 3520, 3520, 250, and 500 gpd. Ten will have 48-inch diameter pump basins and five will have 36-inch diameter basins.

One Smith & Loveless Membrane Bioreactor (MBR) 100-S treatment plant, or approved equal will be installed above ground. The proposed treatment system will include construction and installation of a fine bar screen, flow equalization tank, sludge storage tank, two anoxic zones in series, and a membrane bioreactor tank with a chemical cleaning system. The MBR will be capable of treating an average daily flow of 18,500 gpd, a total organic load of 42 pounds of five-day biochemical oxygen demand (BOD₅) per day, and 10 pounds of Total Kjeldahl Nitrogen per day. Biosolids will be delivered to a licensed municipal treatment plant for further treatment and disposal.

An automatic fine screen that is capable of passing a peak flow rate of 53 gallons per minute (gpm) and has maximum openings of 3-mm will be mounted in the flow equalization zone.

The flow equalization tank will have a capacity of approximately 4,800 gallons. One blower which is capable of 22 cfm will be provided for the flow equalization zone. Two Smith & Loveless MINI-JECT pneumatic ejectors will be provided to pump from the flow equalization zone to the anoxic zone, which are each capable of delivering from 1 to 50 gpm at the design head.

The anoxic zone will have a capacity of 8,500 gallons and will be divided into two sections. The contents of each section of the anoxic zone will be mixed by one submersible mixer.

The aerated sludge holding tank will have a capacity of 15,655 gallons and a waste sludge holding time of 51 days. One decanting airlift will be provided in the sludge holding tank to pump supernatant into the flow equalization zone. Air will be distributed to the sludge holding tank through diffusers at 63 scfm.

The MBR zone will have a total volume of 7,000 gallons and will include 100 flat plate filtration membranes and a fine bubble aeration system. Each filtration module will have 15 square feet (ft²) of membrane area (1500 total ft²) with a nominal pore size of 0.08 microns. The system will

not require the use of permeate pumps; the flow through the membrane will be induced by the head differential across the membrane.

Two blowers will be provided for the MBR tank, with each capable of 53 cfm. The integral air diffuser system will provide a minimum of 0.0306 SCFM of air per square foot of membrane surface area.

A waste sludge airlift pump capable of pumping 20 gpm using 10 scfm of air will be provided in the MBR zone to pump into the sludge holding zone. One recycle pump will recycle effluent from the MBR zone to the first anoxic zone at a rate of 97 gpm.

The MBR instrumentation will include a flow meter and level transducer to monitor membrane flow and flux. A pH and temperature sensors and a DO monitoring system will also be included. The MBR system will be designed to allow cleaning in place.

A constant head tank with a working volume of 35 gallons will be provided for the chemical clean in place system for the MBR and will be supplied from the sodium hypochlorite tank in the building described below. An FRP chemical holding/mixing tank will have a working volume of 55 gallons. A chemical circulation pump capable of pumping 1 gpm at a total dynamic head (THD) of 10 feet will be provided.

A pre-cast concrete building will be furnished and will house the ultraviolet disinfection system, MBR controls, sodium hypochlorite, sodium bicarbonate for alkalinity adjustment, and future ferric chloride feed system. A lockable fiberglass-reinforced housing structure will be provided to protect the motors and blowers.

The chemical feed system for the sodium hypochlorite will include a variable speed drive peristaltic pump capable of pumping between 0.09 gpm to 4.8 gpm.

A closed vessel ultraviolet (UV) disinfection system, TrojanUVFit (PWW model 32AL50), or approved equal will be installed. The UV system will have two trains, installed in parallel, with one UV reactor per train and 32 LPHO lamps per reactor for a total of 64 lamps. The disinfection system will include an in-line flow meter, a UV transmittance monitoring system, and a UV intensity monitoring system. Each UV reactor will have an automatic independently operated wiper system and a skid-mounted UV cleaning system will also be provided. The UV system will be capable of treating a peak hourly effluent flow of 0.178 MGD, which is the expected peak flow for complete future build-out at the site.

An effluent flow meter will be installed after the UV system and prior to an effluent sampling port.

This project will also include general site work appropriate to the scope and purpose of the project. These wastewater facilities will be located in the vicinity of 827 Majestic View Lane, in Lampe in Stone County.

II. FINDING OF AFFORDABILITY

The Finding of Affordability is not applicable. The permittee is not a combined or separate sanitary sewer system or a publicly owned treatment works.

III. CONSTRUCTION PERMIT CONDITIONS

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

1. This construction permit does not authorize discharge.
2. All construction shall be in accordance with the plans and specifications submitted by Mr. Gary M. Lee, P.E. on April 28, 2014 and revisions received August 22, 2014, December 17, 2014, and April 27, 2015.
3. The department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(8).
4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's Southwest Regional Office per 10 CSR 20-7.015(9)(E)2.
5. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"
6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."
7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.
 - A. Sewer mains shall be laid at least 10-feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10-foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18-inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.
 - B. Manholes should be located at least 10-feet horizontally from any existing or proposed water main.
 - C. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18-inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.

- D. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
- a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
 - b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends 10-feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.
8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one 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 www.dnr.mo.gov/env/wpp/epermit/help.htm. See www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.
9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the department's Water Protection Program at 573-751-1300 for more information. See www.dnr.mo.gov/env/wpp/401/ for more information.
10. Upon completion of construction;
- A. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D);
 - B. Submit an electronic copy of the as built if the project was not constructed in accordance with previously submitted plans and specifications; and

IV. REVIEW SUMMARY

1. AMMONIA

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at <http://dnr.mo.gov/pubs/pub2481.htm>.

2. CONSTRUCTION PURPOSE

This construction permit is for a new treatment facility to serve a Young Life youth camp near Lampe, Missouri. The camp planning has been divided into three major phases. The first phase consists of an existing facility that can accommodate up to 50 campers. The wastewater is currently served by several existing septic tank systems serving individual buildings. The second phase will consist of two dormitories housing up to 151 campers and support staff, a cafeteria, central utility plant, swimming pool and maintenance facility. The third and final stage of the camp ground build out will add another two dormitories with the ability to house up to an additional 192 campers with an appropriate number of additional support staff. This construction permit covers phase two with a design flow of 18,500 gallons per day for a population equivalent of 247 campers.

3. FACILITY DESCRIPTION

This construction permit is for a new treatment facility that will include a Membrane Bioreactor treatment system with Blue PRO® upflow phosphorus removal filter and ultraviolet disinfection. The design flow is 18,500 gpd and the facility will discharge to a tributary to Table Rock Lake.

Flow at full build-out will be 43,350 gpd for a population equivalent of 578 campers.

4. COMPLIANCE PARAMETERS

This facility will be expected to meet the following final effluent limitations:

- BOD₅ limits of 10 mg/L monthly average and 15 mg/L daily maximum.
- TSS limits of 15 mg/L monthly average and 20 mg/L daily maximum.
- pH range of 6.5 to 9.0.
- Summer Ammonia limits of 3.7 mg/L daily maximum and 1.4 mg/L monthly average. Winter Ammonia limits of 7.5 mg/L daily maximum and 2.9 mg/L monthly average.
- *E. coli* limits of 126 colonies/ 100 mL daily maximum and monthly average.
- Total Phosphorus of 0.5 mg/L monthly average.
- Oil and Grease of 15 mg/L daily maximum and 10 mg/L monthly average.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The UV disinfection system will be capable of treating peak effluent flow of 0.178 MGD, which is the expected peak flow for complete future build-out at the site, with a UV transmittance of 65%. Alarms will be provided for lamp failures, low UV intensities, and various other scenarios. The following spare parts and equipment will be provided: eight UV lamps, eight quartz sleeves, eight lamp sockets with o-rings, washers and nuts, two ballasts, and one operator's kit.

A pH and temperature sensors shall also be provided for monitoring the MBR Zone, or approved equal, during operation. A DO monitoring system included. The data logger system will include a means capable of transmitting data via phone or wireless service.

Minimum freeboard of any tank in the MBR system is 1-foot.

7,000 gal MBR zone will provide 4.54 hours HRT at design flow.

Remote alarm features for the MBR system: instrumentation will feature a remote accessibility via a web based internet connected device. A panel mounted data logger shall include a means capable of transmitting data via phone or wireless service.

All chemical storage tanks will be equipped with secondary containment.

Sewers will have in-line flushing valves every 500 feet.

6. OPERATING PERMIT MODIFICATION

A new operating permit, MO-0137774, will be issued upon receipt of a statement of work completed and annual fee of \$800.

Review Engineer: Cailie McKinney, E.I. and Diane Reinhardt
Unit Chief Approval: Cindy LePage, P.E.
Date: 7/16/2015

APPENDIX – ANTIDegradation REVIEW

Water Quality and Antidegradation Review

*For the Protection of Water Quality and
Determination of Effluent Limits for Discharge to
Tributary to Table Rock Lake*

by

Clearwater Cove Youth Camp Wastewater Treatment Facility



October 2013

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1. FACILITY INFORMATION

FACILITY NAME: Clearwater Cove Youth Camp WWTF NPDES #: NEW FACILITY

FACILITY TYPE/DESCRIPTION: This is a new treatment facility to serve a Young Life youth camp near Lampe, Missouri. The camp planning has been divided into three major phases. The first phase consists of an existing facility that can accommodate up to fifty campers. The wastewater is currently served by several existing septic tank systems serving individual buildings. The second phase will consist of a single dormitory housing up to 176 campers, a cafeteria, central utility plant, swimming pool and maintenance facility. The third and final stage of the camp ground build out will add another two dormitories with the ability to house up to an additional 254 campers. This Antidegradation Review covers phase two with a design flow of 18,500 gallons per day for a population equivalent of 247 campers.

As a result of the submitted alternative analysis, the applicant's preferred alternative is an Orenco AdvanTex AX-Max Recirculating Filter with Blue Pro Upflow phosphorus removal filter and ultraviolet disinfection. The system would include chemical feed for phosphorus removal and chemical feed for alkalinity adjustment. Water Protection Program staff prefers the membrane bioreactor alternative as we believe it will provide better treatment while still being economically efficient.

COUNTY: Stone UTM COORDINATES: X= 457848 / Y= 4049010
 12- DIGIT HUC: 11010001-1203 LEGAL DESCRIPTION: SW ¼ , NW ¼, Section 30, T 22N, R23W
 EDU*: Ozarks Ecoregion: Ozark Highlands

* - Ecological Drainage Unit

2. WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) 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, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. WATER QUALITY HISTORY:

This is a new facility, so there is no history for this facility. Table Rock Lake is on the 2012 303(d) List as impaired for nutrient/eutrophication biological indications, chlorophyll, and nitrogen with the sources listed as multiple point and non-point sources.

| OUTFALL | DESIGN FLOW (CFS) | TREATMENT LEVEL | RECEIVING WATERBODY | DISTANCE TO CLASSIFIED SEGMENT (MI) |
|---------|-------------------|-----------------|---------------------------------------|-------------------------------------|
| 001 | 0.0286 | Secondary | Tributary to Table Rock Lake (losing) | 1.2 |

3. RECEIVING WATERBODY INFORMATION

| WATERBODY NAME | CLASS | WBID | LOW-FLOW VALUES (CFS) | | | DESIGNATED USES** |
|---------------------------------------|-------|------|-----------------------|------|-------|------------------------|
| | | | 1Q10 | 7Q10 | 30Q10 | |
| Tributary to Table Rock Lake (losing) | U | - | 0.0 | 0.0 | 0.0 | General Criteria |
| Table Rock Lake | L2 | 7313 | - | - | - | AQL, LWW, SCR, WBC (A) |

** Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Livestock & Wildlife Watering (LWW), Secondary Contact Recreation (SCR), Whole Body Contact Recreation (WBC).

RECEIVING WATER BODY SEGMENT #1: Tributary to Table Rock Lake
 Upper end segment* UTM coordinates: X= 457848 / Y= 4049010 (Outfall)
 Lower end segment* UTM coordinates: X= 457846 / Y= 4047036 (meets Table Rock Lake)

*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.

4. GENERAL COMMENTS

Gary M. Lee, P.E., prepared, on behalf of Young Life, the *Preliminary Engineering Report for Wastewater Treatment Facility for Clearwater Cove Youth Camp* dated June 2013. Geohydrological Evaluation was submitted with the request and the receiving stream is losing for discharge purposes (Appendix A: Map). Applicant elected to assume that all pollutants of concern (POC) are significantly degrading the receiving stream in the absence of existing water quality. An alternative 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 C was used to develop this review document. A Missouri Department of Conservation Natural Heritage Review was obtained online by the applicant and it indicated that state endangered species, other species, or natural communities of conservation concern are known to occur on or near the project site. Further review indicated no state-listed endangered species within one mile of the site. One species within one mile of the project site is listed as state rank “SU” (currently unrankable due to lack of information or due to substantially conflicting information about status or trends).

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *Preliminary Engineering Report for Wastewater Treatment Facility for Clearwater Cove Youth Camp* dated June 2013.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix C: Attachment A). 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 was assumed for all POCs (see Appendix C).

TABLE 1. POLLUTANTS OF CONCERN AND TIER DETERMINATION

| POLLUTANTS OF CONCERN | TIER* | DEGRADATION | COMMENT |
|--|-------|-------------|-----------------------|
| BOD ₅ /DO | 2 | Significant | |
| Total Suspended Solids (TSS) | ** | Significant | |
| Ammonia | 2 | Significant | |
| pH | *** | Significant | Permit limits applied |
| Oil & Grease | 2 | Significant | Permit limits applied |
| <i>Escherichia coli</i> (<i>E. coli</i>) | 2 | Significant | |
| Total Phosphorus | 2 | Significant | |
| Aluminum, Total Recoverable | 2 | Significant | |
| Iron, Total Recoverable | 2 | Significant | |

* Tier assumed.

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 C were used by the applicant:

- Tier Determination and Effluent Summary
- Attachment A, Tier 2 with significant degradation.

5.2. EXISTING WATER QUALITY

No existing water quality data was submitted. All POCs were considered to be Tier 2 and significantly degraded in the absence of existing water quality.

5.3. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegradation implementation procedures specify that if the proposed activity does result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Four alternatives from non-degrading to less degrading to degrading alternatives were evaluated. The Geohydrologic evaluation indicated severe overall geologic limitations, including highly permeable bedrock. The proposed site is also located in an area with ridgetops, steep slopes, and poor soil conditions. Due to these factors, land application using irrigation was considered impracticable.

The first discharging alternative, and the base case, was an Orenco AdvanTex Textile Filter (AX-Max system) with a Blue Pro upflow phosphorus removal filter. Two AX-Max units would be installed for secondary treatment and one second stage AX-Max unit would be installed for ammonia reduction. According to the applicant, these systems are reliable and can be designed to meet nitrogen reduction and strict nutrient limits. The system is modular so capacity can be added on demand. Operation and Maintenance costs are relatively low (see Table 2), and the system has a small energy footprint.

The second discharging alternative was a Titan Membrane Bioreactor (MBR). Operation and maintenance for this system would be significantly higher than for the AdvanTex filter, but capital costs are lower. The applicant noted that this system, as well as the AdvanTex, has proven practical applications for resorts in lake areas. This type of treatment would allow for above ground installation, a much smaller equalization basin, and the elimination of the separate phosphorus filter equipment.

The third discharging alternative was an Aeromod extended aeration plant. Operation and maintenance for this system would be higher than for the AdvanTex filter. This system would require on site concrete construction, whereas the AdvanTex and the MBR systems are shop-fabricated and easier to field install.

Only those alternatives that were considered practicable were included in the economic efficiency analysis (see Table 2). Table 2 shows the limits the applicant believes the different treatment alternatives are capable of meeting. This analysis showed that all discharging alternatives were economically efficient. No affordability analysis was provided which would exclude the MBR or extended aeration systems. The Orenco AdvanTex AX-Max system was the applicant's preferred alternative based on this analysis. In the preliminary engineering report, the applicant stated that they intend to bid the Orenco AdvanTex and the Titan MBR systems against each other.

The applicant listed the same level of treatment attainable for all three of the discharging options on Attachment A (see Appendix C). However, department staff prefers the MBR alternative as we believe it will be capable of providing better treatment than the AdvanTex filter. The cost of the MBR is 108% of the base case treatment, which is within the 120% rule of thumb for being economically efficient.

TABLE 2: ALTERNATIVES ANALYSIS COMPARISON

| | Alternative 1: Orenco Textile Filter | Alternative 2: MBR | Alternative 3: Extended Aeration |
|------------------------------|---|-----------------------|-------------------------------------|
| BOD | 10 | 10 | 10 |
| TSS | 15 | 15 | 15 |
| Ammonia | 1.3 | 1.3 | 1.3 |
| Phosphorus | 0.5 | 0.5 | 0.5 |
| Practical | Y | Y | Y |
| Economical | Y | Y | Y |
| Capital Cost | \$1,091,000 | \$850,000 | \$1,150,000 |
| Annual O&M | \$55,000 | \$85,000 | \$65,000 |
| Equivalent Annual Cost (EAC) | \$130,000 | \$140,000 | \$155,000 |
| Ratio of EACs | 1:1 (base case) | 1:1.08 | 1:1.15 |

5.3.1. REGIONALIZATION ALTERNATIVE

Within Section II B 1. of the AIP, discussion of the potential for discharge to a regional waste water collection system is mentioned. There are no treatment facilities within five miles capable of treating the additional flow this facility will produce, and there are no municipal treatment facilities within five miles.

NEEDS A WAIVER TO PREVENT CONFLICT WITH AREA WIDE MANAGEMENT PLAN APPROVED UNDER SECTION 208 OF THE CLEAN WATER ACT AND/OR UNDER 10 CSR 20-6.010(3) (B) 1 OR 2 CONTINUING AUTHORITIES? (Y OR N) N

5.3.2 SOCIAL AND ECONOMIC IMPORTANCE EVALUATION

The affected community includes those who reside on, vacation at, or otherwise enjoy Table Rock Lake, as well as the youth from throughout Missouri who will benefit from the camp and its programs. This camp facility will provide social benefits for the campers attending and is open to kids from economically depressed communities, kids with disabilities and teenage mothers. The camp will also seek to introduce the campers to sustainable and environmentally responsible living by exposing the campers to new and innovative infrastructure technologies supporting various aspects of the campgrounds. It is the intent of the applicant for this project to have a low carbon footprint, low emissions, and close to zero waste programs.

The applicant provided detailed calculations of the expected economic benefits which detailed the economic benefit to Missouri through the camp operating expenditures, employee compensation, new jobs, and construction expenditures. The camp’s expenditures will trigger further economic activity as these expenditures create income for recipients (employees and other businesses). This subsequent spending causes “multiplier effects” in the economy that were estimated by the applicant using multiplier coefficients. The ongoing economic activity of the camp is expected to provide 42 direct and indirect jobs in Missouri, result in a total annual economic activity of \$6,571,500, and result in annual household earnings of \$2,021,000. The construction activities for the camp are expected to result in 67 direct and indirect jobs in Missouri, \$31,670,000 in total economic activity, and \$6,340,000 in household earnings.

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 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 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(4)(A)4.B.(I)(a)].

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

8. PERMIT LIMITS AND MONITORING INFORMATION

WASTELOAD ALLOCATION
STUDY CONDUCTED (Y OR N):

USE ATTAINABILITY
ANALYSIS CONDUCTED (Y OR N):

WHOLE BODY CONTACT
USE RETAINED (Y OR N):

OUTFALL #001

WET TEST (Y OR N):

FREQUENCY:

N/A

AEC:

N/A

METHOD:

N/A

TABLE 3. EFFLUENT LIMITS OUTFALL #001

| PARAMETER | UNITS | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | BASIS FOR LIMIT (NOTE 2) | MONITORING FREQUENCY |
|--|--------|------------------|-------------------|--------------------|--------------------------------|-------------------------|
| FLOW | MGD | * | | * | FSR | ONCE/MONTH |
| BIOCHEMICAL OXYGEN DEMAND ₅ | MG/L | 15 | | 10 | FSR | ONCE/MONTH |
| TOTAL SUSPENDED SOLIDS | MG/L | 20 | | 15 | FSR | ONCE/MONTH |
| PH | SU | 6.5–9.0 | | 6.5–9.0 | FSR | ONCE/MONTH |
| AMMONIA AS N (APR 1 – SEPT 30) | MG/L | 3.7 | | 1.4 | WQBEL | ONCE/MONTH |
| AMMONIA AS N (OCT 1 – MAR 31) | MG/L | 7.5 | | 2.9 | WQBEL | ONCE/MONTH |
| <i>ESCHERICHIA COLIFORM (E. COLI)</i> | NOTE 1 | 126** | | 126** | FSR | ONCE/MONTH |
| TOTAL PHOSPHORUS | MG/L | * | | 0.5 | FSR | ONCE/MONTH |
| ALUMINUM, TOTAL RECOVERABLE | MG/L | * | | * | FSR | ONCE/MONTH |
| IRON, TOTAL RECOVERABLE | MG/L | * | | * | FSR | ONCE/MONTH |
| OIL & GREASE | MG/L | 15 | | 10 | FSR | ONCE/MONTH |

NOTE 1 – COLONIES/100 mL

NOTE 2– WATER QUALITY-BASED EFFLUENT LIMITATION - WQBEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT - PEL; OR FEDERAL/STATE REGULATION - FSR. ALSO, PLEASE SEE THE **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.**

* - Monitoring requirements only.

** - The Monthly Average for *E. coli* shall be reported as a Geometric Mean.

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:

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

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow

C_e = effluent concentration

Q_e = 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).

2) Alternative Analysis-based – Using the preferred alternative’s treatment capacity for conventional pollutants such as BOD₅ and TSS that are provided by the consultant as the WLA, the significantly-degrading effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 to derive the average weekly limit (AWL). For toxic and nonconventional pollutant such as ammonia, the treatment capacity is applied as the significantly-degrading effluent monthly average (AML). A maximum daily can be derived by dividing the AML by 1.19 to determine the long-term average (LTA). The LTA is then multiplied by 3.11 to obtain the maximum daily limitation. This is an accepted procedure that is defined in USEPA’s “Technical Support Document For Water Quality-based Toxics Control” (EPA/505/2-90-001).

Note: Significantly-degrading effluent limits have been based on the authority included in Section III. Permit Consideration of the AIP. Also 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 BOD₅ 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 BOD₅ 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.

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 (BOD₅).** BOD₅ limits of 10 mg/L monthly average and 15 mg/L daily maximum were proposed. These are the losing stream limits at 10 CSR 20-7.015(4)(B)1.
- **Total Suspended Solids (TSS).** TSS limits of 15 mg/L monthly average and 20 mg/L daily maximum were proposed. These are the losing stream limits at 10 CSR 20-7.015(4)(B)2.
- **pH.** pH shall be maintained in the range from six and one-half to nine (6.5– 9.0) standard units [10 CSR 20-7.015(4)(B)3.].

- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & 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; Winter: October 1 – March 31.

Summer

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

Chronic WLA: $C_e = ((0.0286 + 0.0)1.5 - (0.0 * 0.01)) / 0.0286$
 $C_e = 1.5 \text{ mg/L}$

Acute WLA: $C_e = ((0.0286 + 0.0)12.1 - (0.0 * 0.01)) / 0.0286$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 1.5 \text{ mg/L (0.780)} = \mathbf{1.2 \text{ mg/L}}$ [CV = 0.6, 99th Percentile, 30 day avg.]
 $LTA_a = 12.1 \text{ mg/L (0.321)} = 3.88 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

$MDL = 1.2 \text{ mg/L (3.11)} = \mathbf{3.7 \text{ mg/L}}$ [CV = 0.6, 99th Percentile]
 $AML = 1.2 \text{ mg/L (1.19)} = \mathbf{1.4 \text{ mg/L}}$ [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: $C_e = ((0.0286 + 0.0)3.1 - (0.0 * 0.01)) / 0.0286$
 $C_e = 3.1 \text{ mg/L}$

Acute WLA: $C_e = ((0.0286 + 0.0)12.1 - (0.0025 * 0.01)) / 0.0286$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 3.1 \text{ mg/L (0.780)} = \mathbf{2.4 \text{ mg/L}}$ [CV = 0.6, 99th Percentile, 30 day avg.]
 $LTA_a = 12.1 \text{ mg/L (0.321)} = 3.9 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

$MDL = 2.4 \text{ mg/L (3.11)} = \mathbf{7.5 \text{ mg/L}}$ [CV = 0.6, 99th Percentile]
 $AML = 2.4 \text{ mg/L (1.19)} = \mathbf{2.9 \text{ mg/L}}$ [CV = 0.6, 95th Percentile, n = 30]

| Season | Maximum Daily Limit (mg/l) | Average Monthly Limit (mg/l) |
|--------|----------------------------|------------------------------|
| Summer | 3.7 | 1.4 |
| Winter | 7.5 | 2.9 |

Notice to Permittee: On August 22, 2013, the Environmental Protection Agency (EPA) published a notice in the Federal Register announcing the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, *Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013*, is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect aquatic life in water.

The Water Protection Program (WPP) is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria and will be proposed in the next Missouri Water Quality Standards triennial review in 2014. WPP is suggesting that all permittees consider the lower ammonia criteria and adjust the proposed alternative's treatment design, if they so choose. Consideration of the future ammonia criteria at this time could avoid a near-future upgrade. More information about the new ammonia criteria for aquatic life protection may be found at: <http://dnr.mo.gov/pubs/pub2481.pdf>

- **E. coli.** Effluent limitations for losing streams are 126 colonies per 100 ml monthly average and 126 colonies per 100 ml daily maximum [10 CSR 20-7.015 (4)(B)4.] and [10 CSR 20-7.031(4)(C), Table A]. Per the Clean Water Commission Directive in January 2011, the *E. coli* sampling/monitoring frequency shall be set to match the monitoring frequency of other parameters in the permit 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 month for the monthly average). The daily maximum requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Further, the limit may change depending on the outcome of future state effluent regulation revision. Please see **General Assumptions of the WQAR #7.**
- **Total Phosphorus.** Effluent limitation for Table Rock Lake is 0.5 mg/L monthly average as per 10 CSR 20-7.015 (3)(F).
- **Aluminum, Total Recoverable.** Monitoring requirement only. This facility uses chemicals for phosphorous removal that may contain aluminum. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards for Aluminum (Total Recoverable).
- **Iron, Total Recoverable.** Monitoring requirement only. This facility uses chemicals for phosphorous removal that may contain iron. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards for Iron (Total Recoverable).
- **Oil & Grease.** Conventional pollutant, [10 CSR 20-7.031, Table A]. Effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

11. ANTIDegradation Review Preliminary Determination

The proposed new facility discharge, Clearwater Cove Youth Camp WWTF, 0.0185 MGD will result in significant degradation of the segment identified in the tributary to Table Rock Lake. The Orenco AdvanTex AX-Max system with a Blue Pro upflow phosphorus removal filter was determined to be the base case technology (lowest cost alternative that meets technology and water quality based effluent limitations). The cost effectiveness of the other technologies were evaluated, and the AdvanTex system was found to be cost effective and was determined to be the applicant's preferred alternative.

The Orenco AdvanTex AX-Max system is not covered in 10 CSR 20-8 Design Guides and may be considered a new treatment technology. As a new technology, 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.

The Department prefers the membrane bioreactor alternative as we believe it will provide better treatment while still being economically efficient.

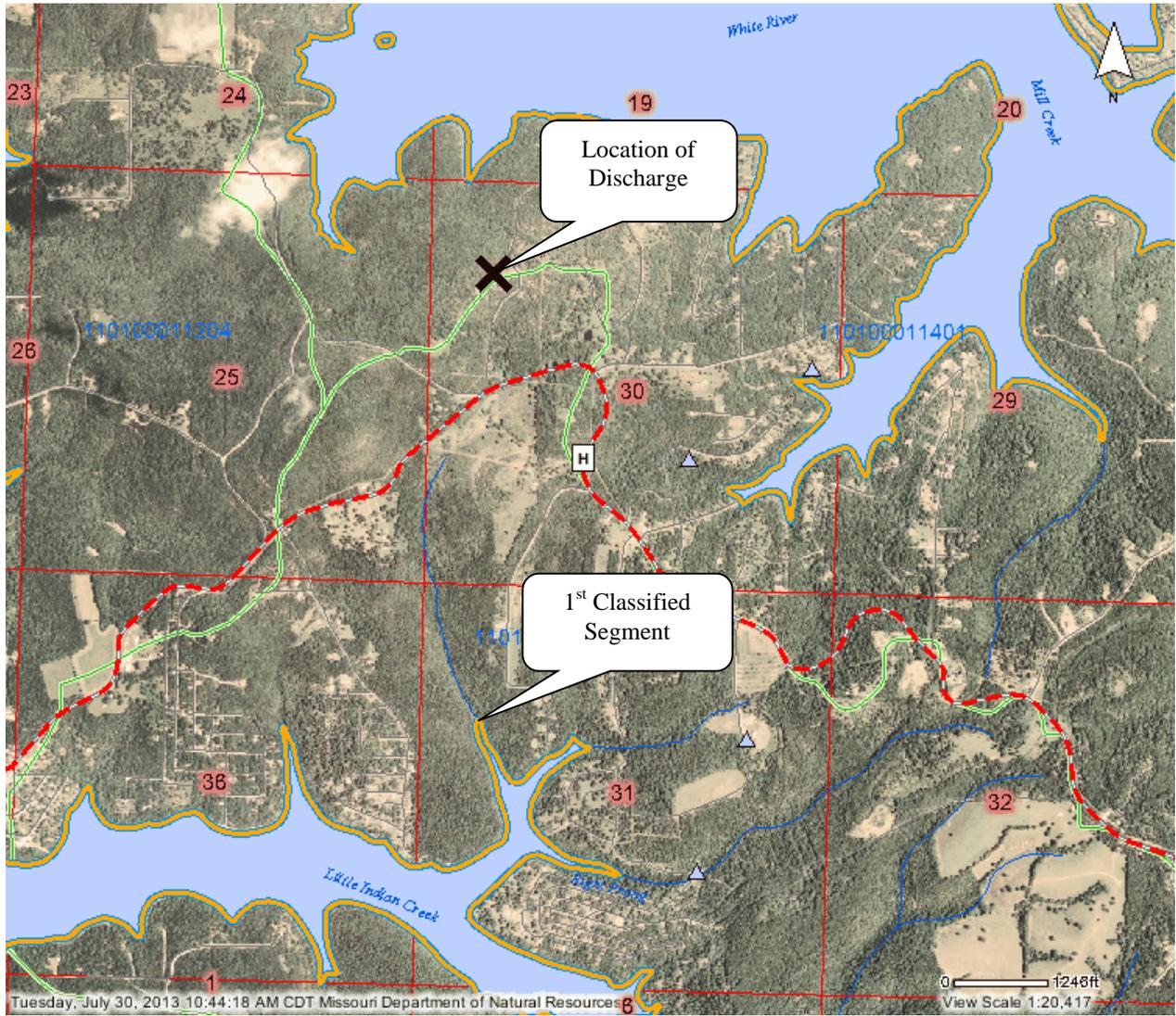
Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. MDNR has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis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

Reviewer: Cailie McKinney, E.I.

Date: 10/01/2013

Unit Chief: John Rustige, P.E.

APPENDIX A: MAP OF DISCHARGE LOCATION



APPENDIX B: NATURAL HERITAGE REVIEW

| | | | |
|--|---|---|--|
|  | Missouri Department of Conservation Natural Heritage Review Report June 13, 2013 -- Page 1 of 2 | | Resource Science Division P. O. Box 180 Jefferson City, MO 65102 Prepared by: Emily Clancy Emily.Clancy@mdc.mo.gov (573) 522 – 4115 ext. 3182 |
| | GARY M. LEE PE 801 WESTCHESTER AVE. HARRISONVILLE, MISSOURI 64701 glee@uam-llc.com | Project type: Wastewater Location/Scope: Section 30 of T22N R23W County: Stone Query reference: Proposed WWTP Clearwater Cove Youth Camp Query received: June 6, 2013 | |
| <p><i>This NATURAL HERITAGE REVIEW is not a site clearance letter. Rather, it identifies public lands and sensitive resources known to have been located close to and/or potentially affected by the proposed project. On-site verification is the responsibility of the project. Natural Heritage records were identified at some date and location. This report considers records near but not necessarily at the project site. Animals move and, over time, so do plant communities. To say "there is a record" does not mean the species/habitat is still there. To say that "there is no record" does not mean a protected species will not be encountered. These records only provide one reference and other information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Look for additional information about the biological and habitat needs of records listed in order to avoid or minimize impacts. More information is at http://mdc.mo.gov/discover-nature/places-go/natural-areas and mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx. Contact information for the department's Natural History Biologist is online at http://mdc.mo.gov/contact-us.</i></p> | | | |
| <p>Level 3 issues: Records of <u>federal-listed</u> (these are also state-listed) species or critical habitats near the project site: Natural Heritage records identify <u>no</u> critical habitats, <u>no</u> federal-listed species records within one mile of the site, or in the public land survey section listed above or sections adjacent.</p> <p>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.</p> <p>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.</p> <p><small>FEDERAL LIST species/habitats are protected under the Federal Endangered Species Act. Consult with the U.S. Fish and Wildlife Service (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; 573-234-2132).</small></p> | | | |
| <p>Level 2 issues: Records of <u>state-listed</u> (not federal-listed) endangered species AND / OR <u>state-ranked</u> (not state-listed endangered) species and natural communities of conservation concern. The Department tracks these species and natural communities due to population declines and/or apparent vulnerability. Natural Heritage records identify <u>no</u> state-listed endangered species within 1 mile of the site.</p> <p>Natural Heritage records identify eastern tiger salamander (<i>Ambystoma tigrinum</i>, state-rank SU) within 1 mile of the project site. The state-rank SU is defined as currently unrankable due to lack of information or due to substantially conflicting information about status or trends. More information about this species can be found at: http://mdc.mo.gov/discover-nature/field-guide/eastern-tiger-salamander-0.</p> <p>See http://mdc.mo.gov/sites/default/files/resources/2010/04/2013_species_concern.pdf for a</p> | | | |

complete list of species and communities of conservation concern.

STATE ENDANGERED species are listed in and protected under the Wildlife Code of Missouri (3CSR10-4.111).

General recommendations related to this project or site, or based on information about the historic range of species (unrelated to any specific Natural Heritage records):

- Indiana bats (*Myotis sodalis*, federally and state listed "endangered") hibernate during winter months, in caves primarily in the southern half of Missouri. They spend summer months, primarily north of the Missouri River, roosting and raising young under the bark of trees in 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, especially from September to April. **If any trees need to be removed by 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).**
- Gray bats (*Myotis grisescens*, federal and state-listed endangered) are likely to occur in the project area, as they forage over streams, rivers, and reservoirs in this part of Missouri. Avoid entry or disturbance of any cave inhabited by gray bats and when possible retain forest vegetation along the stream and from the gray bat cave opening to the stream. See <http://mdc.mo.gov/104> for best management recommendations.
- Stone County has known karst geologic features (e.g. caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in natural heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are species of conservation concern) are influenced by changes to water quality, so check your project site for any karst features and make every effort to protect groundwater in the project area. See http://mdc.mo.gov/nathis/caves/manag_construc.htm for best management information.
- Streams in the area should be protected from soil erosion, water pollution and in-stream activities that modify or diminish aquatic habitats. Best management recommendations relating to streams and rivers may be found at: http://mdc.mo.gov/sites/default/files/resources/2013/02/constproinearstreams_2013.pdf.
- 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, so inspect and clean equipment thoroughly before moving between project sites.
 - 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 ($\geq 104^{\circ}$ F, typically available at do-it-yourself carwash sites), and dry in the hot sun before using again.

These recommendations are ones project managers might prudently consider based on a general understanding of species needs and landscape conditions. Natural Heritage records largely reflect sites visited by specialists in the last 30 years. Many privately owned tracts have not been surveyed and could host remnants of species once but no longer common.

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

- 1) Attachment A: Proposed effluent limits for BOD₅ and TSS were changed to comply with losing stream effluent limits at 10 CSR 20-7.015(4)(B). Dissolved oxygen will not be a limit in this review. As noted in the antidegradation review, the department believes the membrane bioreactor will be capable of providing a greater level of treatment than that provided on Attachment A.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
WATER QUALITY REVIEW ASSISTANCE/ANTIDEGRADATION REVIEW REQUEST
 PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

| | | | |
|---|---|---|-----------------------------------|
| TYPE OF PROJECT <input type="checkbox"/> Grant <input type="checkbox"/> SRF Loan <input checked="" type="checkbox"/> All Other Projects | | | |
| REQUESTER Clearwater Cove Youth Camp | | TELEPHONE NUMBER WITH AREA CODE (816) 805-3546 | |
| PERMITTEE / FACILITY NAME Clearwater Cove Youth Camp - Young Life | | MSOP NUMBER (IF APPLICABLE) | |
| COUNTY Stone | | SIC / NAICS CODE | |
| REASON FOR REQUEST | | | |
| <input checked="" type="checkbox"/> New Discharge (See Instruction #9) <input type="checkbox"/> Upgrade (No expansion) (See AIP) <input type="checkbox"/> Expansion <input type="checkbox"/> QAPP or Study Review | | | |
| DESCRIPTION OF PROPOSED ACTIVITY: This is a youth camp for young adults, high school age. While it will be open year round most activity will be in the summer months | | | |
| FACILITY INFORMATION | | | |
| 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 ISSUES* | | | |
| *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 ¹ (CHECK) | RECEIVING WATER BODY ² |
| 1 | SW 1/4, NW 1/4, Section 30 T22 H, R 23 W | ✓ | Table Rock Lake |
| ¹ Please attach topographic map (See: www.dnr.mo.gov/internetmapviewer/) with outfall locations clearly marked. For additional outfalls, attach a separate form. ² Please see general instructions for discharges to streams. | | | |
| OUTFALL | NEW DESIGN FLOW** (MGD) | TREATMENT TYPE | EFFLUENT TYPES* |
| 1 | 0.0185 | Advanced | Domestic Waste |
| * 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. | | | |
| SIGNATURE | | DATE: 7/6/2013 | |
| PRINT NAME Gary M. Lee | | EMAIL ADDRESS glee@uam-llc.com | |
| Applicant supplied (check all that apply): <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 checked="" type="checkbox"/> Heritage Review Determination. See Instruction #8. <input checked="" type="checkbox"/> Geohydrologic Evaluation. See Instruction #9. <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). | | PHONE NUMBER: (816) 805-3546 Submit request to: Missouri Department of Natural Resources, Water Protection Program, ATTN: WPCB Engineering Section P.O. Box 176 Jefferson City, MO 65102-0176 Phone: 573-751-1300 Fax: 573-522-9920 | |

RECEIVED

JUL 29 2013

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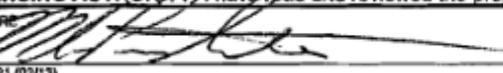
MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY FOR PUBLIC NOTICE
ATTACHMENT A: TIER 2 – SIGNIFICANT DEGRADATION

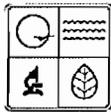
WATER PROTECTION PROGRAM

| | | | |
|--|--------------------------|---|-------------------|
| 1. FACILITY | | | |
| NAME Clearwater Cove Youth Camp | | TELEPHONE NUMBER WITH AREA CODE (816) 805-3546 | |
| ADDRESS (PHYSICAL) Stone County | CITY Lampe | STATE MO | ZIP CODE |
| 2. OWNER | | | |
| NAME AND OFFICIAL TITLES Young Life | | | |
| ADDRESS PO Box 520 | CITY Colorado Springs | STATE CO | ZIP CODE 80901 |
| TELEPHONE NUMBER WITH AREA CODE (816) 805-3546 | | E-MAIL ADDRESS glee@uam-llc.com | |
| 3. CONTINUING AUTHORITY The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf . | | | |
| NAME AND OFFICIAL TITLES Young Life | | | |
| ADDRESS PO Box 520 | CITY Colorado Springs | STATE CO | ZIP CODE 80901 |
| TELEPHONE NUMBER WITH AREA CODE | | E-MAIL ADDRESS | |
| 4. RECEIVING WATER BODY SEGMENT #1 | | | |
| NAME Table Rock Lake | | | |
| 4.1 UPPER END OF SEGMENT (Location of discharge) UTM _____ OR Lat 36°, 35' Long 93°8' | | | |
| 4.2 LOWER END OF SEGMENT UTM _____ OR Lat _____, Long _____ | | | |
| Per the Missouri Antidegradation 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." | | | |
| 5. WATER BODY SEGMENT #2 (IF APPLICABLE, Use another form if a third segment is needed) | | | |
| NAME | | | |
| 5.1 UPPER END OF SEGMENT UTM _____ OR Lat _____, Long _____ | | | |
| 5.2 LOWER END OF SEGMENT UTM _____ OR Lat _____, Long _____ | | | |
| 6. WET WEATHER ANTICIPATIONS | | | |
| 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 the antidegradation review report. | | | |
| What is the Wet Weather Flow Peaking Factor in relation to design flow? None | | | |
| Wet Weather Design Summary: There is no anticipated wet weather flow | | | |

| 7. EXISTING WATER QUALITY DATA OR MODEL SUMMARY | | | | |
|--|---|----------------------|-------------------------|---------------------|
| Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section II.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 well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Watershed Protection Section. Additional Information needed with the EWQ data includes: 1) Date existing water quality data was provided by the Watershed Protection Section, 2) Approval date by the Watershed Protection Section of the QAPP, project sampling plan, and data collected for all appropriate POCs. | | | | |
| Comments/Discussion: | | | | |
| 8. SUMMARY OF THE POLLUTANTS OF CONCERN AND THE PROPOSED 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). | | | | |
| 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 | 272 | 20 | 20 |
| TSS | MG/L | 320 | 20 | 20 |
| DISSOLVED OXYGEN | MG/L | | 1 | 1 |
| AMMONIA | MG/L | 42 | 1.3 | 1.3 |
| BACTERIA (E. COLI) | CFUS | | HD | HD |
| Phosphorous | MG/L | 7 | .5 | .5 |
| | | | | |
| | | | | |
| Proposed limits must not violate water quality standards, be protective of beneficial uses, and achieve the highest statutory and regulatory requirements. | | | | |
| *Assumed Tier 2. | | | | |
| 9. IDENTIFYING ALTERNATIVES | | | | |
| Supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Attach all supportive documentation in the Antidegradation Review report. | | | | |
| Applicants choosing to use a new wastewater technology that are considered an "unproven technology" in Missouri in their Tier 2 Reviews with alternative analysis must comply with the requirements set forth in the <i>New Technology Definitions and Requirements Factsheet</i> that can be found at: http://dnr.mo.gov/pubs/pub2453.pdf . | | | | |
| Non-degrading alternatives: Land application using irrigation was considered, but soils and slopes rendered it non applicable | | | | |
| Alternatives ranging from less-degrading to degrading including Preferred Alternative (All treatment levels for POCs must at a minimum meet water quality standards): | | | | |
| Alternatives | Level of Treatment Attainable for each Pollutant of Concern | | | |
| | BOD5 (MG/L) | TSS MG/L | AMMONIA AS N MG/L | |
| Extended Air | 20 | 20 | 1.3 | |
| MBR | " | " | " | |
| Recirculating Filter | " | " | " | |
| | | | | |
| | | | | |
| | | | | |

| 10. DETERMINATION OF THE REASONABLE ALTERNATIVE |
|--|
| <p>Per the Antidegradation Implementation Procedure Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient and affordable." Provide basis and supporting documentation in the Antidegradation Review report. Please do not write "See Report" for any box below.</p> |
| <p>Practicability Summary:</p> <p>"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a.</p> <p>Both the recirculating filter and MBR technologies have proven practical applications for resorts ground lake areas. They are relatively reliable and reassure routine normal maintenance.</p> |
| <p>Economic Efficiency Summary:</p> <p>Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b.</p> <p>See attached: All alternations were similar like recirculating filter being the lowest equivalent annual cost. The owner will bid the recirculating filter against the MBR</p> |
| <p>Affordability Summary:</p> <p>Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."</p> <p>All alternatives are affordable. The MBR offers the lowest capital cost but a higher annual cost, mostly due to allowance for membrane replacement.</p> |
| <p>Preferred Chosen Alternative:</p> <p>The Orenco Recirculating Filter w/ continuous backwash up flow filter was chosen for best bid but an MBR - Titan Unit will be bid as an alternate.</p> |
| <p>Reasons for Rejecting the other Evaluated Alternatives:</p> <p>The extended air requires on site concrete construction, making it more expensive. The other alternatives are shop fabricated and easier to field install.</p> |
| <p>Comments/Discussion:</p> |

| | | | |
|---|--|---------------------------------|--------------------------------|
| 11. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE | | | |
| <p>If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the Antidegradation Implementation Procedure Section II.E. 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.</p> | | | |
| <p>Identify the affected community: 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 project has been working closely with Stone County Planning and Zoning. Youth throughout Missouri will benefit from the camp and its programs.</p> | | | |
| <p>Identify relevant factors that characterize the social and economic conditions of the affected community: Examples of social and economic factors are provided in the Antidegradation Implementation Procedure Section II.E.1., but specific community examples are encouraged. The closest similar camp for Missourians is Colorado. This site will allow more Missouri youth to attend camp.</p> | | | |
| <p>Describe the important social and economic development associated with the project: Determining benefits for the community and the environment should be site specific and in accordance with the Antidegradation Implementation Procedure Section II.E.1. Please see attached Economic Analysis - which outlined direct and indirect economic impact to Missouri.</p> | | | |
| <p>PROPOSED PROJECT SUMMARY: The organization "Young Life" is planning to construct a youth camp facility on Table Rock Lake in the Ozarks of Missouri near Lampe, Mo called Clearwater Cove. Young Life's mission is to introduce adolescents to Jesus Christ and to help them grow in their faith. At Young Life's camps in North America, kids are treated to resort-quality facilities for which Young Life has become known. As Young Life's worldwide outreach continues to grow, their camping program is expanding as well. Regardless of the facility, the experience is the same — kids getting away from the pressures of everyday life, having fun with friends and their Young Life leaders, and hearing the message of God's love in terms they can understand. And Young Life camping is open to kids who often are overlooked: those from economically depressed communities, kids with disabilities and teenage mothers. In addition, to these objectives and goals the Clearwater Cove Camp will seek to introduce campers to sustainable and environmentally responsible living by exposing the campers to new and innovative infrastructure technologies supporting the campgrounds</p> | | | |
| <p>Attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed and dated by a registered professional engineer of Missouri.</p> | | | |
| <p>CONSULTANT: 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.</p> | | | |
| SIGNATURE  | | DATE 7-6-13 | |
| NAME AND OFFICIAL TITLES / LICENSE # Gary M. Lee | | COMPANY NAME Lee Engineering | |
| ADDRESS 801 Westchester Ave | | CITY Harrisonville | STATE / ZIP CODE MO / 64701 |
| TELEPHONE NUMBER WITH AREA CODE (816) 805-3546 | | E-MAIL ADDRESS | |
| <p>OWNER: I have read and reviewed the prepared documents and agree with this submittal.</p> | | | |
| SIGNATURE  | | DATE 7/24/13 | |
| <p>CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.</p> | | | |
| SIGNATURE  | | DATE 7/24/13 | |



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

RECEIVED

APR 28 2014

CP0001649
 AP 18291 C13242

| FOR DEPARTMENT USE ONLY | |
|--------------------------|---------------------|
| APP NO. | CP NO. |
| FEE RECEIVED 4-28-14 | CHECK NO. 558397 |
| DATE RECEIVED #750.00 | J.S. |

WATER PROTECTION PROGRAM

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: 10/30/2013
 Attached is the No Degradation Evaluation Conclusion of Antidegradation Review form
- 1.3 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: _____ NO N/A (If Not Applicable, complete No. 1.4.)
- 1.4 [Complete only if answered Not Applicable on No. 1.3.] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
 YES NO
- 1.5 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 submittal. Denote which form: A B B2
 N/A Please explain: _____
- 1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? YES NO
- 1.9 Is the appropriate fee included with this application? YES NO (See instructions for appropriate fee.)

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

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT

Clearwater Cove Young Life Camp

2.2 PROJECT DESCRIPTION

Wastewater Treatment facility serving the proposed camp grounds. Both a recirculating filter system and an MBR system will be bid as competing technologies

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

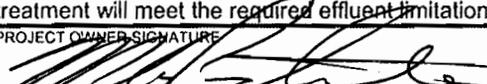
Biosolids will be delivered to a licensed municipal treatment plant for further treatment and disposal

2.4 DESIGN INFORMATION

- A. Current population: 0; Design population: 187
- B. Actual Flow: 18700 gpd; Design Average Flow: 18700 gpd;
 Actual Peak Daily Flow: 76000 gpd; Design Maximum Daily Flow: 18700 gpd

2.5 ADDITIONAL INFORMATION

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

| | | | |
|---|--------------------------|---|--|
| 3.0 WASTEWATER TREATMENT FACILITY | | | |
| NAME Clearwater Cove Younglife | | TELEPHONE NUMBER WITH AREA CODE 719-381-1843 | E-MAIL ADDRESS MPOINDEXTER@SC.YOUNGLIFE.ORG |
| ADDRESS (PHYSICAL) 827 MAJESTIC VIEW LANE | CITY Lampe | STATE Mo | ZIP CODE 65681 COUNTY Stone |
| Wastewater Treatment Facility: Mo- (Outfall Of) | | | |
| 3.1 Legal Description: ne ¼, sw ¼, nw ¼, Sec. 30, T 22 N, R 23W (Use additional pages if construction of more than one outfall is proposed.) | | | |
| 3.2 UTM Coordinates Easting (X): 36,35.9 Northing (Y): 93,28.17 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83) | | | |
| 3.3 Name of receiving streams: Table Rock La | | | |
| 4.0 PROJECT OWNER | | | |
| NAME Young Life | | TELEPHONE NUMBER WITH AREA CODE (719) 381-1843 | E-MAIL ADDRESS MPOINDEXTER@SC.YOUNGLIFE.ORG |
| ADDRESS PO Box 520 | CITY Colorado Springs | STATE CO | ZIP CODE 80901 |
| 5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system. | | | |
| NAME Young Life | | TELEPHONE NUMBER WITH AREA CODE (719) 381-1843 | E-MAIL ADDRESS MPOINDEXTER@SC.YOUNGLIFE.ORG |
| ADDRESS PO Box 520 | CITY Colorado Springs | STATE CO | ZIP CODE 80901 |
| 5.1 A letter from the continuing authority, if different than the owner, is included with this application. <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A | | | |
| 5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY. | | | |
| A. Is a copy of the certificate of convenience and necessity included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| 5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION. | | | |
| A. Is a copy of the as-filed restrictions and covenants included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| 6.0 ENGINEER | | | |
| ENGINEER NAME / COMPANY NAME Gary M. Lee PE | | TELEPHONE NUMBER WITH AREA CODE (816) 805-3546 | E-MAIL ADDRESS glee@uam-llc.com |
| ADDRESS 801 Westchester Ave | CITY Harrisonville | STATE Mo | ZIP CODE 64701 |
| 7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility. | | | |
| PROJECT OWNER SIGNATURE  | | | |
| PRINTED NAME Mark Poindexter | | | DATE 2/10/14 |
| TITLE OR CORPORATE POSITION Director of Construction | | TELEPHONE NUMBER WITH AREA CODE (719) 381-1843 | E-MAIL ADDRESS MPOINDEXTER@SC.YOUNGLIFE.ORG |
| 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. | | | |

PART B – LAND APPLICATION ONLY

(Submit only if the proposed construction project includes land application of wastewater.)

8.0 FACILITY INFORMATION

8.1 Type of wastewater to be irrigated: Domestic State/National Park Seasonal business
 Municipal Municipal with a pretreatment program or significant industrial users
 Other (explain) _____

8.2 Months when the business or enterprise will operate or generate wastewater:

12 months per year Part of the year (list months): _____

8.3 This system is designed for:

- No-discharge.
 Partial irrigation when feasible and discharge rest of time.
 Irrigation during recreational season, April – October, and discharge during November – March.
 Other (explain) _____.

9.0 STORAGE BASINS

9.1 Number of storage basins: _____ (Use additional pages if greater than three basins.)

9.2 Type of basins: Steel Concrete Fiberglass Earthen Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

| | | | | | | |
|-----------|--------------|-------------|-------------|-----------------|------------------|---------------|
| Basin #1: | Length _____ | Width _____ | Depth _____ | Freeboard _____ | Berm Width _____ | % Slope _____ |
| Basin #2: | Length _____ | Width _____ | Depth _____ | Freeboard _____ | Berm Width _____ | % Slope _____ |
| Basin #3: | Length _____ | Width _____ | Depth _____ | Freeboard _____ | Berm Width _____ | % Slope _____ |

9.4 Storage Basin operating levels (report as feet below emergency overflow level).

| | | |
|-----------|--|--|
| Basin #1: | Maximum operating water level _____ ft | Minimum operating water level _____ ft |
| Basin #2: | Maximum operating water level _____ ft | Minimum operating water level _____ ft |
| Basin #3: | Maximum operating water level _____ ft | Minimum operating water level _____ ft |

9.5 Design depth of sludge in storage basins.

Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.

Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.7 Total design sludge storage: _____ dry tons and _____ cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Number of irrigation sites _____ Total Acres _____ Maximum % field slopes _____

Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres

Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres

Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres

(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation: Grass hay Pasture Timber Row crops

Other (describe) _____

10.3 Wastewater flow (dry weather) gallons per day: Average annual _____ Seasonal _____ Off-season _____

10.4 Land application rate (design flow including 1-in-10 year storm water flows):

Design: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week

Actual: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week

10.5 Total irrigation per year (gallons): Design: _____ gal Actual: _____ gal

10.6 Actual months used for irrigation (check all that apply):

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

10.7 Land application rate is based on:

Hydraulic Loading Other (describe) _____

Nutrient Management Plan (N&P) If N&P is selected, is the plan included? YES NO



Construction Permit – Wastewater Treatment Facility Application Instructions for Form 780-2189

All blanks must be filled in when the application is submitted to the Missouri Department of Natural Resources. This includes the required signature.

A land disturbance permit is required if construction will result in the disturbance of one or more acres of land. A land disturbance permit is available through the department's ePermitting system at www.dnr.mo.gov/env/wpp/epermit/help.htm. A permit fee of \$300 is required.

Part A – Basic Application Information

- 1.0 If any of the questions in this section are answered no, this application may be considered incomplete and returned to the applicant.
- 1.1 Check the appropriate box. If the project is funded with federal or state monies, supply the funding agency name and project number.
- 1.2 Check the appropriate box. Provide the date of department approval for the antidegradation report. Include a copy of the approved *Water Quality and Antidegradation Review* with this application. Not every construction project may require an antidegradation review. In these cases, applicants may complete the No Degradation Evaluation Conclusion of Antidegradation Review form online at www.dnr.mo.gov/forms/780-2026-f.pdf. Include completed and signed form with this application. For more information, guidance documents and forms concerning antidegradation visit www.dnr.mo.gov/env/wpp/permits/antideg-implementation.htm.
- 1.3 Check the appropriate box and provide the date of department approval. Per 10 CSR 20-8.110(3)(C), facility plans must be approved by the department prior to the submittal of plans and specifications and a construction permit application. "Facility plans must be completed for projects involving wastewater treatment facility projects and projects receiving funding through the grant and loan programs under 10 CSR 20-4" in accordance with 10 CSR 20-8.110(4)(A)4. The department has developed a fact sheet to aid in the development of an approvable facility plan. This document is available online at www.dnr.mo.gov/pubs/pub2416.pdf.
- 1.4 Complete only if No. 1.3 is answered Not Applicable. Check the appropriate box. For wastewater treatment facilities with a design flow under 22,500 gallons per day, or gpd, an engineering report may be required by the department in accordance with 10 CSR 20-6.010(4)(D)1 and 10 CSR 20-8.020(3). The department will require an engineering report for any new wastewater treatment facilities and for any major modifications to an existing wastewater treatment facility.
- 1.5 Check the appropriate box. Provide a copy of the appropriate plans and specifications for department review when applying for a construction permit per 10 CSR 20-8.110(3)(C), 10 CSR 20-8.020(5) and 10 CSR 20-8.020(6). A Missouri registered professional engineering seal, signature and date is required on each sheet of the plans and the cover of the technical specifications.

The department will accept plans and specifications in electronic form on a CD and in the Adobe® PDF searchable format. If the plans are scanned, set the resolution to a minimum of 200 dpi at 17 by 22 inches.

Note: Additional sets of plans and specifications may be required by the department for final approval and issuance of the construction permit. See 10 CSR 20-8.110(6)(A)1.

- 1.6 Check the appropriate box. A summary of design shall accompany the plans and specifications when applying for a construction permit per 10 CSR 20-8.110(5) and 10 CSR 20-8.020(7). The department has developed a fact sheet to aid in the development of an acceptable summary of design. This document is available online at www.dnr.mo.gov/pubs/pub2417.pdf. For wastewater treatment facilities with a design flow under 22,500 gpd, a summary of design may not be required by the department.
- 1.7 Check the appropriate box. Include the applicable operating permit application. No fee is required.
 - Form B is available online at <http://dnr.mo.gov/forms/780-1512-f.pdf>.
 - Form B2 is available online at <http://dnr.mo.gov/forms/780-1805-f.pdf>.
 - Form A is available online at <http://dnr.mo.gov/forms/780-1479-f.pdf>.
- 1.8 Check the appropriate box. More information about the Compliance and Enforcement Water Protection Program is available online at http://www.dnr.mo.gov/env/wpp/compliance_enforcement.htm.
- 1.9 Check the appropriate box. Include the fee with your application.
 - \$750 for a wastewater treatment facility with a design flow of less than 500,000 gpd.
 - \$2,200 for a wastewater treatment facility with a design flow of 500,000 gpd or greater.

Note: Incomplete permit applications or related engineering documents will be returned by the department if they are not completed in the time frame established by the department in a comment letter to the project owner. Permit fees for returned applications shall be forfeited. See 10 CSR 20-6.010(4)(E). Permit fees for applications being processed by the department that are withdrawn by the applicant shall be forfeited. See 10 CSR 20-6.011(4)(B).

- 2.1 Provide the name of the proposed construction project.
- 2.2 Briefly describe the construction project by providing the number and capacity of each new unit.
- 2.3 Briefly describe the method of sludge handling, use and disposal at the treatment facility.
- 2.4 Provide the project design information and when required in the units specified.
 - A. Provide the current population and the design population to be served by the wastewater treatment facility.
 - B. Provide the estimated design flow information in accordance with 10 CSR 20-8.110(4)(C)4.A.

Design average flow – The design average flow is the average of the daily volumes to be received for a continuous 12 month period expressed as a volume per unit time. However, the design average flow for facilities having critical seasonal high hydraulic loading periods (e.g., recreational areas, campuses and industrial facilities) shall be based on the daily average flow during the seasonal period.

Design maximum daily flow – The design maximum daily flow is the largest volume of flow to be received during a continuous 24-hour period expressed as a volume per unit time.

2.5 Provide the additional project information.

A. Attach a topographic map of the area extending at least one mile beyond the facility property boundaries. This map must show the outline of the facility and the following information. A topographic map is available online at www.dnr.mo.gov/internetmapviewer/ or from the Department of Natural Resources' Division of Geology and Land Survey in Rolla, Missouri at 573-368-2125. (Submittals of more than one map may be necessary to show the entire area.)

1. The area surrounding the wastewater treatment facility, including all unit processes.
2. The major pipes or other structures through which wastewater enters the treatment facility and the pipes or other structures through which treated wastewater is discharged from the treatment facility. Include outfalls from bypass piping, if applicable.
3. The actual point of discharge.
4. Wells, springs, other surface water bodies and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment facility and 2) listed in public record or otherwise known to the applicant.
5. Any areas where biosolids produced by the treatment facility are treated, stored, or disposed.
6. If the treatment facility receives waste classified as hazardous under the Resource Conservation and Recovery Act, or RCRA, by truck, rail, or special pipe, show on the map where hazardous waste enters the treatment works and where it is treated, stored or disposed.
7. Outline any wastewater land application sites.

B. Provide a process flow diagram with the influent and effluent design average flow and peak flow capabilities. Also, depict all of the treatment facility components and the corresponding hydraulic capacities of each component. In addition, include all recycle flows in the diagram. If land application is used, depict all irrigation equipment and application sites.

3.0 Complete the Wastewater Treatment Facility information. Include the Missouri State Operation Permit number, outfall number, physical location, and other appropriate contact information.

3.1 Provide the project legal description. The department's mapping system is available online at www.dnr.mo.gov/internetmapviewer/.

3.2 A Global Positioning System, or GPS, is a satellite-based navigation system. The department prefers that a GPS receiver is used and the displayed coordinates submitted. If access to a GPS receiver is not available, use a mapping system to approximate the coordinates.

3.3 Provide the name of the receiving stream(s) to which the discharge is directed and any subsequent tributary until a continuous flowing stream is reached.

4.0 Complete Project Owner information. Include the legal name, address, phone number with area code and email address.

5.0 Complete Continuing Authority contact information. If same as the Project Owner, write "Same as above".

Include the permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system. See 10 CSR 20-6.010(3) for the regulatory requirement regarding continuing authority.

- 5.1 Check the appropriate box. Include a letter signed by the continuing authority (if not same as the project owner) stating they will “accept, operate and maintain” the wastewater treatment facility after successful construction.

If the continuing authority will not accept and agree to operate and maintain the wastewater treatment facility, this application will be considered incomplete.

- 5.2 Complete if the continuing authority is a Missouri Public Service Commission, or PSC, regulated entity. See 10 CSR 20-6.010(3)(B)3 for more information. This information is not necessary for existing wastewater treatment facilities currently permitted with a PSC entity as owner and continuing authority.
- 5.3 Complete if the continuing authority is a property owners association. See 10 CSR 20-6.010(3)(B)5 for more information. This information is not necessary for existing wastewater treatment facilities currently permitted with the property owners association as owner and continuing authority.
- 6.0 Complete Engineer contact information.
- 7.0 All applications must be signed as follows in accordance with 10 CSR 20-6.010(2)(B) and the signatures must be original:
- A. For a corporation, by an officer having responsibility for the overall operation of the regulated facility or activity or for environmental matters.
 - B. For a partnership or sole proprietorship, by a general partner or the proprietor.
 - C. For a municipal, state, federal or other public facility, by either a principal executive officer or by an individual having overall responsibility for environmental matters at the facility.

Part B – Land Application

Complete Part B only if the proposed construction project includes land application of wastewater from a treatment facility.

- 8.0 Provide the applicable Facility Information land application information. Check the appropriate boxes.
- 9.0 Provide the applicable Storage Basins information. Check the appropriate boxes.
- Freeboard – The depth from the top of the berm to the emergency spillway. Minimum depth is one foot.
 - Safety Volume – The depth to contain the 25-year, 24-hour storm event. Minimum depth is one foot.
 - Maximum Operating Water Level – The water level at the bottom of the safety volume. Minimum depth is two feet below the top of the berm.
 - Minimum Operating Water Level – The water level above the bottom of the lagoon basin for seal protection. Minimum depth is two feet and may be greater when additional treatment volume is included.
 - Total Depth is from the top of the berm to the bottom of the lagoon basin including freeboard.
- 10.0 Provide the applicable Land Application System information. Check the appropriate boxes.
- 10.7 Check the appropriate box. If the land application rate is based on a Nutrient Management Plan, or N and P, include the plan with this application for department review.

Mail the completed form and applicable fee to the department.

If there are any questions concerning this form, contact the Department of Natural Resources, Water Protection Program at 800-361-4827 or 573-751-1300.

For More Information

Missouri Department of Natural Resources
Water Protection Program
P.O. Box 176
Jefferson City, MO 65101-0176
800-361-4827 or 573-751-1300
www.dnr.mo.gov/env/wpp