

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

MISSOURI CLEAN WATER COMMISSION



**MISSOURI STATE OPERATING PERMIT**

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92<sup>nd</sup> Congress) as amended,

Permit No. MO-0122823

Owner: Show-Me Christian Youth Home  
Address: 243024 Mahin Road, La Monte, MO 65337

Continuing Authority: Same as above  
Address: Same as above

Facility Name: Show-Me Christian Youth Home  
Facility Address: 243024 Mahin Road, La Monte, MO 65337

Legal Description: NE ¼, SW ¼, NW ¼, Sec. 34, T46N, R23W, Pettis County  
UTM Coordinates: X=461422, Y=4287002

Receiving Stream: Tributary to Long Branch  
First Classified Stream and ID: Long Branch (P) (01843)  
USGS Basin & Sub-watershed No.: (10300103-0402)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

**FACILITY DESCRIPTION**

Outfall #001 – Group Home and School – SIC #8361/#4952  
**No Certified Operator Required**  
Septic tanks / three-cell lagoon / septage disposal by contract hauler  
Design population equivalent is 40.  
Design flow is 4,000 gallons per day.  
Actual flow is 5,300 gallons per day.  
Design sludge production is 0.375 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

March 1, 2012  
Effective Date

  
Sara Parker Pauley, Director, Department of Natural Resources

February 28, 2017  
Expiration Date

  
Dorothy Franklin, Director, Kansas City Regional Office

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective upon issuance and remain in effect through February 28, 2015. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	once/month	24 hr. estimate
Biochemical Oxygen Demand <sub>5</sub>	mg/L		65	45	once/quarter**	grab
Total Suspended Solids	mg/L		110	70	once/quarter**	grab
Escherichia coli ( <i>E. coli</i> ) (Note 1)	#/100 ml	1030		206	once/quarter**	grab
pH – Units	SU	***		***	once/quarter**	grab
Ammonia as N	mg/L	*		*	once/quarter**	grab
Temperature (effluent)	°C	*		*	once/quarter**	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2012. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective March 1, 2015 and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	once/month	24 hr. estimate
Biochemical Oxygen Demand <sub>5</sub>	mg/L		65	45	once/quarter**	grab
Total Suspended Solids	mg/L		110	70	once/quarter**	grab
Escherichia coli ( <i>E. coli</i> ) (Note 1)	#/100 ml	1030		206	once/quarter**	grab
pH – Units	SU	***		***	once/quarter**	grab
Ammonia as N	mg/L				once/quarter**	grab
Summer (April 1 – Sept 30)		3.6		1.4		
Winter (Oct 1 – March 31)		7.5		2.9		
Temperature (effluent)	°C	*		*	once/quarter**	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE APRIL 28, 2015. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

**B. STANDARD CONDITIONS**

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- \* Monitoring requirement only.
- \*\* See table below for quarterly sampling.
- \*\*\* pH is measured in pH units and is not to be averaged. The pH is to be maintained at or above 6.5 pH units.

Sample discharge at least once for the months of:	Report is due:
January, February, or March	(1st Quarter) April 28
April, May, or June	(2nd Quarter) July 28
July, August, or September	(3rd Quarter) October 28
October, November, or December	(4th Quarter) January 28

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Note 1 - Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
  - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
    - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
    - (2) controls any pollutant not limited in the permit.
  - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
  - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.
3. Permittee will cease discharge by connection to a facility with an area-wide management plan per 10 CSR 20-6.010(3)(B) within 90 days of notice of its availability. The permittee shall obtain department approval for closure or alternate use of the facility.
4. Water Quality Standards
  - (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
  - (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
    - (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
    - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
    - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
    - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
    - (5) There shall be no significant human health hazard from incidental contact with the water;
    - (6) There shall be no acute toxicity to livestock or wildlife watering;
    - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
    - (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
5. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
  - (1) One hundred micrograms per liter (100 µg/L);
  - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

C. SPECIAL CONDITIONS (continued)

- (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
  - (4) The level established in Part A of the permit by the Director.
  - (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.
6. Report as no-discharge when a discharge does not occur during the monitoring period.
  7. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
  8. Bypasses are not authorized at this facility and are subject to 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3)(i), and with Standard Condition Part I, Section B, subsection 2.b. Bypasses are to be reported to the Kansas City Regional Office
  9. A least one gate, constructed of materials comparable to the fence, must be provided to access the lagoon and provide for maintenance and mowing. The gate shall remain locked except when opened by the permittee to perform maintenance or mowing.
  10. At least one sign shall appear on the fence on each side of each facility. Minimum wording shall be "SEWAGE TREATMENT FACILITY – KEEP OUT", in letters at least 2 inches high.
  11. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.
  12. The inner and outer berm slopes shall not be steeper than three to one (3:1). Inner berm slopes shall not be flatter than four to one (4:1). Consideration may be given to steeper inner slopes provided special attention is given to stabilizing the slope with rip-rap, concrete, or other rigid materials.
  13. The berms of storage basins shall be mowed and kept free of any trees, muskrat dens, or other potential sources of damage to the berms.
  14. An all-weather access road shall be provided from a public right-of-way to the treatment facility.
  15. The discharge from the lagoon system shall be conveyed to the receiving stream via a closed pipe or a paved or rip-rapped open channel. Sheet or meandering drainage is not acceptable. The outfall sewer shall be protected against the effects of floodwater, ice or other hazards as to reasonably insure its structural stability and freedom from stoppage. The outfall shall be maintained so that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving stream.
  16. A minimum of two (2) feet freeboard must be maintained in the lagoon cell.
  17. The facility shall ensure that adequate provisions are provided to prevent surface water intrusion in to the lagoon and to divert storm water runoff around the lagoon and protect embankments from erosion.

D. SCHEDULE OF COMPLIANCE

1. The final daily maximum and monthly average Ammonia as N limits shall become effective three (3) years after the issue date of the permit. The Effluent Regulation, 10 CSR 20-7.031(10) allows the permittee up to three (3) years from the issuance date of this permit to comply with new or revised National Pollutant Discharge Elimination System (NPDES) or Missouri operating permit limitations based on criteria in the Clean Water Commission Regulations. It states that such compliance "shall be achieved with all deliberate speed and no later than three (3) years from the date of issuance of the permit." Therefore modification to the facilities must be made if required to meet the final effluent limits of this permit.
2. If modifications to the facility are required to meet the final effluent limits of this permit, the Show-Me Christian Youth Home shall submit to the department a facility plan (or engineering report) by **December 1, 2012**, for changes to the Show-Me Christian Youth Home Wastewater Treatment Facility (WWTF) so the discharge from the facility will meet the final effluent limits for Ammonia as Nitrogen.

D. SCHEDULE OF COMPLIANCE (continued)

3. Within **six months** of department approval of the facility plan, the Show-Me Christian Youth Home will then submit to the department engineering plans, technical specifications, and a construction permit application, for changes to the Show-Me Christian Youth Home WWTF so the discharge from the facility will meet the final effluent limits for Ammonia as N.
4. If completion of construction will be more than 1 year, the Show-Me Christian Youth Home shall submit interim progress reports every 12 months from **March 1, 2012**.
5. If the Show-Me Christian Youth Home determines that modifications to the facility are not needed to meet the final effluent limits of this permit, the Show-Me Christian Youth Home shall submit a letter to the department by issue **December 1, 2012** stating that modifications are not needed for Show-Me Christian Youth Home WWTF to meet the final effluent limitations of this permit.
6. The Show-Me Christian Youth Home WWTF will meet final effluent limits by **March 1, 2015**.

PERMIT TRANSFER

This permit may be transferred to a new owner by submitting an "Application for Transfer of Operating Permit" signed by the seller and buyer of the facility, along with the appropriate modification fee.

PERMIT RENEWAL REQUIREMENTS

Unless this permit is terminated, the permittee shall submit an application for the renewal of this permit no later than six (6) months prior to the permit's expiration date. Failure to apply for renewal may result in termination of this permit and enforcement action to compel compliance with this condition and the Missouri Clean Water Law.

TERMINATION

In order to terminate this permit, the permittee shall notify the department by submitting Form J, included with the State Operating Permit. The permittee shall complete Form J and mail it to the department at the address noted in the cover letter of this permit. Proper closure of any storage structure is required prior to permit termination. A closure plan shall be submitted to the department and approved prior to initiating closure activities.

DUTY OF COMPLIANCE

The permittee shall comply with all conditions of this permit. Any noncompliance with this permit constitutes a violation of Chapter 644, Missouri Clean Water Law, and 10 CSR 20-6. Noncompliance may result in enforcement action, termination of this authorization, or denial of the permittee's request for renewal. This permit authorizes only the activities described in this permit.

**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 FACT SHEET  
 FOR THE PURPOSE OF RENEWAL OF  
 MO-0122823  
 SHOW-ME CHRISTIAN YOUTH HOME**

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for a: Major , Minor , Industrial Facility ; Variance ;  
 Master General Permit ; General Permit Covered Facility ; and/or permit with widespread public interest .

**Part I – Facility Information**

Facility Type: Non-POTW - Group Homes and School  
 Facility SIC Code(s): #8361/#4952

Facility Description: The facility consists of septic tanks followed by a three-cell lagoon. The septage is disposed by a contract hauler. The design population equivalent is 40. The design flow is 4,000 gallons per day with an actual flow of 5,300 gallons per day based on submitted discharge monitoring reports. The design sludge production is 0.375 dry tons per year.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation? Yes - ; No - .

Application Date: 04/14/11 Expiration Date: 09/21/11  
 Last Inspection: The facility has not been inspected.

**OUTFALL(S) TABLE:**

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
#001	0.0062	equivalent to secondary	domestic wastewater	~ 0.25

Outfall #001: Legal Description: NE ¼, SW ¼, NW ¼, Sec. 34, T46N, R23W, Pettis County  
 UTM Coordinates: X=461422, Y=4287002  
 Receiving Stream: Tributary to Long Branch  
 First Classified Stream and ID: Long Branch (P) (01843)  
 USGS Basin & Sub-watershed No.: (10300103-0402)

**Receiving Water Body's Water Quality & Facility Performance History:**

No Stream Surveys or Low Flow Studies have been completed at this facility. The facility has never been inspected since it was first permitted in 2001. Please see table for reported effluent limitation exceedances. The operator said that the lagoon continually has duckweed on all three cells and he has made a device out of pipes to pull across the cells to remove the duckweed.

<b>LIMITATION EXCEEDANCES FROM SUBMITTED DISCHARGE MONITORING REPORTS</b>						
PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	REPORTED VALUE	DATE OR REPORTING PERIOD
Biochemical Oxygen Demand <sub>5</sub>	mg/L		65	45	94 48	4 <sup>th</sup> Q 2006 1 <sup>st</sup> Q 2007
Total Suspended Solids	mg/L		110	70	114 125	4 <sup>th</sup> Q 2006 1 <sup>st</sup> Q 2009
Fecal Coliform	#/100 mL	1000		400	4200	3 <sup>rd</sup> Q 2010

**Comments:** The design flow is 4,000 gallons per day. For the purposes of this permit, the design population equivalent is based on a flow of 100 gallons per capita per day, as described in Regulation 10 CSR 20-9.020(1)(D) Population Equivalent (P.E.). Therefore, the design population equivalent is 40. The change in design population equivalent from 25 to 40 does not increase the allowable capacity of the facility (the facility can still treat a design flow of 4,000 gallons per day); it simply clarifies the basis for the design population equivalent and brings consistency with other permits.

According to submitted Discharge Monitoring Reports, the facility has exceeded its design flow several times. During a site visit, the operator said they have gone though the collection system and disconnected any rain gutters that were attached along with ensuring the surface drainage does not direct storm water towards the lagoon and collection system. After completing this process, the system has not discharged above its design flow according to the operator. They are also installing water meters so that they will be able to track their water usage.

Total Residual Chlorine has been removed because the facility does not chlorinate at this time.

**Part II – Operator Certification Requirements**

This facility is not required to have a certified operator.

**Part III – Receiving Stream Information**

**APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:**

As per Missouri’s Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented and discussed in each outfall’s Effluent Limitation Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]:
- Lake or Reservoir [10 CSR 20-7.015(3)]:
- Losing [10 CSR 20-7.015(4)]:
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]:
- Special Stream [10 CSR 20-7.015(6)]:
- Subsurface Water [10 CSR 20-7.015(7)]:
- All Other Waters [10 CSR 20-7.015(8)]:

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1<sup>st</sup> classified receiving stream’s beneficial water uses to be maintained, are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

**RECEIVING STREAM(S) TABLE:**

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Tributary to Long Branch	U	N/A	General Criteria	10300103	Central Plains / Blackwater / Lamine
Long Branch	P	1843	LWW, AQL, WBC***		

\* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

\*\* - Ecological Drainage Unit

\*\*\* - UAAs were conducted 2005 and 2008 with the recommendation to keep WBC use and to add SCR use.

N/A - Not Applicable.

**MIXING CONSIDERATIONS:**

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

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

**RECEIVING STREAM MONITORING REQUIREMENTS:**

No receiving water monitoring requirements recommended at this time.

**Part IV – Rationale and Derivation of Effluent Limitations & Permit Conditions**

**ANTI-BACKSLIDING:**

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of §402(o) of the Clean Water Act, and [40 CFR Part 122.44].

**ANTIDegradation:**

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of an Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- Renewal no degradation proposed and no further review necessary.

**AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:**

As per [10 CSR 20-6.010(3)(B)], An applicant may utilize a lower preference continuing authority by submitting, as part of the application, a statement waiving preferential status from each existing higher preference authority, providing the waiver does not conflict with any area-wide management plan approved under §208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the Department.

**BIOSOLIDS & SEWAGE SLUDGE:**

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (e.g. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Additional information regarding biosolids and sludge is located at the following web address: <http://dnr.mo.gov/env/wpp/pub/index.html>, items WQ422 through WQ449.

- Sludge/biosolids are removed by contract hauler or are stored in the lagoon.

**COMPLIANCE AND ENFORCEMENT:**

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

- Not Applicable - The permittee/facility is not currently under Water Protection Program enforcement action.

**REASONABLE POTENTIAL ANALYSIS (RPA):**

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

- Applicable - A RPA was conducted on Ammonia as N. Statistically, there should be at least eight data points for each season to conduct a RPA; the facility has submitted at least half of the recommended number of points and the majority of the submitted data is well above the CCC for Ammonia, therefore there is a reasonable potential the facility will have excursions above the water quality standard for Ammonia. Please see **Appendix A – RPA Results**.

**REMOVAL EFFICIENCY:**

Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD<sub>5</sub>) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals.

- Not Applicable - This wastewater treatment facility is not a POTW. Influent monitoring is not being required to determine percent removal.

**SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):**

Sanitary Sewer Overflows (SSOs) are defined as an untreated or partially treated sewage release, they are considered bypassing under state regulation [10 CSR 20-2.010(11)] and should not be confused with the federal definition of bypass. SSOs have a variety of causes including blockages, line breaks, and sewer defects that allow excess storm water and ground water to (1) enter and overload the collection system, and (2) overload the treatment facility. Additionally, SSOs can be also be caused by lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations.

Additionally, Missouri RSMo §644.026.1 mandates that the Department require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities.

- Not applicable - This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri State Environmental Laws and Regulations to allow untreated wastewater to discharge to waters of the state.

**SCHEDULE OF COMPLIANCE (SOC):**

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

- Applicable - The time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(10)].

**WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:**

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined the total amount of pollutant that may be discharged into that stream without endangering its water quality.

- Applicable - Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation:

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

Where C = downstream concentration  
Cs = upstream concentration  
Qs = upstream flow  
Ce = effluent concentration  
Qe = effluent flow

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

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

Number of Samples "n": Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance, which should, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For Total Ammonia as Nitrogen, "n = 30" is used.

**WATER QUALITY STANDARDS:**

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

**WHOLE EFFLUENT TOXICITY (WET) TEST:**

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

- Not Applicable - At this time, the permittee is not required to conduct WET test for this facility.

**40 CFR 122.41(M) - BYPASSES:**

The federal Clean Water Act (CWA), Section 402 prohibits wastewater dischargers from "bypassing" untreated or partially treated sewage (wastewater) beyond the headworks. A bypass, which includes blending, is defined as an intentional diversion of waste streams from any portion of a treatment facility, [40 CFR 122.41(m)(1)(i)]. Additionally, Missouri regulation [10 CSR 20-2.010(11)] defines a bypass as the diversion of wastewater from any portion of wastewater treatment facility or sewer system to waters of the state. Only under exceptional and specified limitations do the federal regulations allow for a facility to bypass some or all of the flow from its treatment process. Bypasses are prohibited by the CWA unless a permittee can meet all of the criteria listed in [40 CFR 122.41(m)(4)(i)(A), (B), & (C)]. Any bypasses from this facility are subject to the reporting required in [40 CFR 122.41(l)(6)] and per Missouri's Standard Conditions I, Section B, part 2.b. Additionally, anticipated Bypasses include bypasses from peak flow basins or similar devices designed for peak wet weather flows.

- Not Applicable - This facility does not bypass.

**303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):**

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can assimilate before its water quality is affected. If a water body is determined to be impaired, as listed on the 303(d) list, then a watershed management plan will be developed that shall include a TMDL calculation.

- Not Applicable - This facility does not discharge directly to a 303(d) listed stream. A section of Long Branch (00857) was listed on the 2002 Missouri 303(d) list for unknown pollutants. This section of the receiving stream, which was on the list, is upstream of the facility; therefore this facility does not contribute to this impairment. The facility is approximately 0.35 mile from Muddy Creek (00853) which is listed on the 2006 Missouri 303(d) list for chloride from multiple point sources and color impairment from Tyson Foods and the 2008 Missouri 303(d) list for an unknown pollutant from an unknown source. A TMDL is scheduled to be developed for all impairments in 2014 for Muddy Creek; the permit may be reopened and modified if it is determined that the facility is contributing to the impairment of Muddy Creek.

**Part V – Effluent Limits Determination**

**Outfall #001 – Main Facility Outfall**

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit

**EFFLUENT LIMITATIONS TABLE:**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Flow	MGD	1	*		*	NO	S
BOD5	mg/L	1/4		65	45	NO	S
TSS	mg/L	1/4		110	70	NO	S
Escherichia coli ( <i>E. coli</i> )	**	1	1030		206	YES	1000/400 Fecal Coliform
pH	SU	1/4	≥ 6.5		≥ 6.5	YES	6.0 – 9.0
Ammonia as N (Interim)	mg/L	2/5/9	*		*	NO	S
Ammonia as N (Final Summer (April 1 – Sept 30))	mg/L	2/5/9	3.6		1.4	YES	*
Ammonia as N (Final Winter (Oct 1 – March 31))	mg/L	2/5/9	7.5		2.9	YES	*
Temperature (effluent)	° C	5/9	*		*	NO	S

\* - Monitoring requirement only.

\*\* - # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

N/A – Not applicable

S – Same as previous operating permit.

**Basis for Limitations Codes:**

- |  |                                    |
|--|------------------------------------|
| 1. State or Federal Regulation/Law       | 7. Antidegradation Policy          |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model             |
| 3. Water Quality Based Effluent Limits   | 9. Best Professional Judgment      |
| 4. Lagoon Policy                         | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy                        | 11. WET Test Policy                |
| 6. Antidegradation Review                |                                    |

**OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:**

- Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.

- **Biochemical Oxygen Demand (BOD<sub>5</sub>)**. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit. [10 CSR 20-7.015(8)(A)3.A]
- **Total Suspended Solids (TSS)**. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit. [10 CSR 20-7.015(8)(A)3.A]
- **Escherichia coli (E. coli)**. Monthly average of 206 colonies per 100 mL as a geometric mean and Daily Maximum of 1030 colonies per 100 mL during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(4)(C).
- **pH**. Effluent limitations have been modified to reflect the change in the Code of State Regulations. pH is measured in standard pH units and is not to be averaged. The pH is to be maintained at or above 6.5 pH units. [10 CSR 20-7.015(8)(A)3.A].
- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3] default pH 7.8 SU Background total ammonia nitrogen = 0.01 mg/L. No mixing considerations allowed; therefore, WLA = appropriate criterion.

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

**Summer: April 1 – September 30**

Chronic WLA: C<sub>c</sub> = 1.5 mg/L

Acute WLA: C<sub>c</sub> = 12.1 mg/L

LTA<sub>c</sub> = 1.5 mg/L (0.780) = **1.17 mg/L**

[CV = 0.6, 99<sup>th</sup> Percentile, 30 day avg.]

LTA<sub>a</sub> = 12.1 mg/L (0.321) = 3.88 mg/L

[CV = 0.6, 99<sup>th</sup> Percentile]

Use most protective number of LTA<sub>c</sub> or LTA<sub>a</sub>.

MDL = 1.17 mg/L (3.11) = 3.64 mg/L

[CV = 0.6, 99<sup>th</sup> Percentile]

AML = 1.17 mg/L (1.19) = 1.39 mg/L

[CV = 0.6, 95<sup>th</sup> Percentile, n=30]

**Winter: October 1 – March 31**

Chronic WLA: C<sub>c</sub> 3.1 mg/L

Acute WLA: C<sub>c</sub> = 12.1 mg/L

LTA<sub>c</sub> = 3.1 mg/L (0.780) = **2.42 mg/L**

[CV = 0.6, 99<sup>th</sup> Percentile, 30 day avg.]

LTA<sub>a</sub> = 12.1 mg/L (0.321) = 3.88 mg/L

[CV = 0.6, 99<sup>th</sup> Percentile]

Use most protective number of LTA<sub>c</sub> or LTA<sub>a</sub>.

MDL = 2.42 mg/L (3.11) = 7.53 mg/L

[CV = 0.6, 99<sup>th</sup> Percentile]

AML = 2.42 mg/L (1.19) = 2.88 mg/L

[CV = 0.6, 95<sup>th</sup> Percentile, n=30]

Season	Maximum Daily Limit (mg/L)	Average Monthly Limit (mg/L)
Summer	3.6	1.4
Winter	7.5	2.9

- **Temperature**. Monitoring requirement due to the toxicity of Ammonia varies by temperature. [10 CSR 20-7.031(4)(B)7]
- **Minimum Sampling and Reporting Frequency Requirements**. Sampling and reporting frequency requirements have been retained from the previous permit except for flow which has been change to monthly to verify the facility is operating at design flow.

**Part VI - Finding of Affordability**

Pursuant to Section 644.145, RSMo, the Department is required to determine whether a permit or decision is affordable and makes a finding of affordability for certain permitting and enforcement decisions. This requirement applies to discharges from combined or separate sanitary sewer systems or publically-owned treatment works.

- Not Applicable - The Department is not required to determine findings of affordability because the facility is not a **combined or separate sanitary sewer system for a publically-owned treatment works**.

## **Part VII – Administrative Requirements**

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

### **PUBLIC NOTICE:**

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- The Public Notice period for this operating permit is tentatively scheduled to begin on January 13, 2012, or is in process.

- The Public Notice period for this operating permit was from January 20, 2012, to February 21, 2012. No responses received or responses to the Public Notice of this operating permit do not warrant the modification of effluent limits and/or the terms and conditions of this permit.

**DATE OF FACT SHEET:** OCTOBER 21, 2011

### **COMPLETED BY:**

Terrie Burch, Environmental Specialist  
Kansas City Regional Office  
NPDES Permit Unit  
816-622-7047  
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**Part VIII – Appendices**

**APPENDIX A – RPA RESULTS:**

Parameter	CMC*	CCC*	RWC*	n**	Range max/min	CV***	MF	RP Yes/No
Ammonia as N - Summer (April 1 – Oct 31)	12.1	1.5	41.16	5	1.1 – 9.8	0.6	4.2	Yes****
Ammonia as N - Winter (Nov 1 – Apr 30)	12.1	3.1	44.84	6	5.0 – 11.8	0.6	3.8	Yes****

N/A – Not Applicable

\* - Units are mg/L.

\*\* - n is the number of samples. If the number of samples is greater than 10, then the CV value must be used in the WQBEL.

\*\*\* - Coefficient of Variation (CV) is calculated by dividing the Standard Deviation ( $\sigma$ ) of the sample set by the Mean ( $\mu$ ) of the same sample set.

\*\*\*\* - Statistically, there should be at least eight data points for each season to conduct a RPA; the facility has submitted at least half of the recommended number of points and the majority of the submitted data is well above the CCC for Ammonia, therefore there is a reasonable potential the facility will have excursions above the water quality standard for Ammonia.

CMC - Criteria Maximum Concentration. It is the maximum acute concentration of the constituent allowed in the receiving water as specified by 10 CSR 20-7.031.

CCC - Criteria Continuous Concentration. It is the maximum chronic concentration of the constituent allowed in the receiving stream as specified by 10 CSR 20-7.031.

RWC - Receiving Water Concentration. It is the projected maximum concentration of the constituent discharged from the facility calculated from available data.

MF - Multiplying Factor. 99% Confidence Level and 99% Probability Basis.

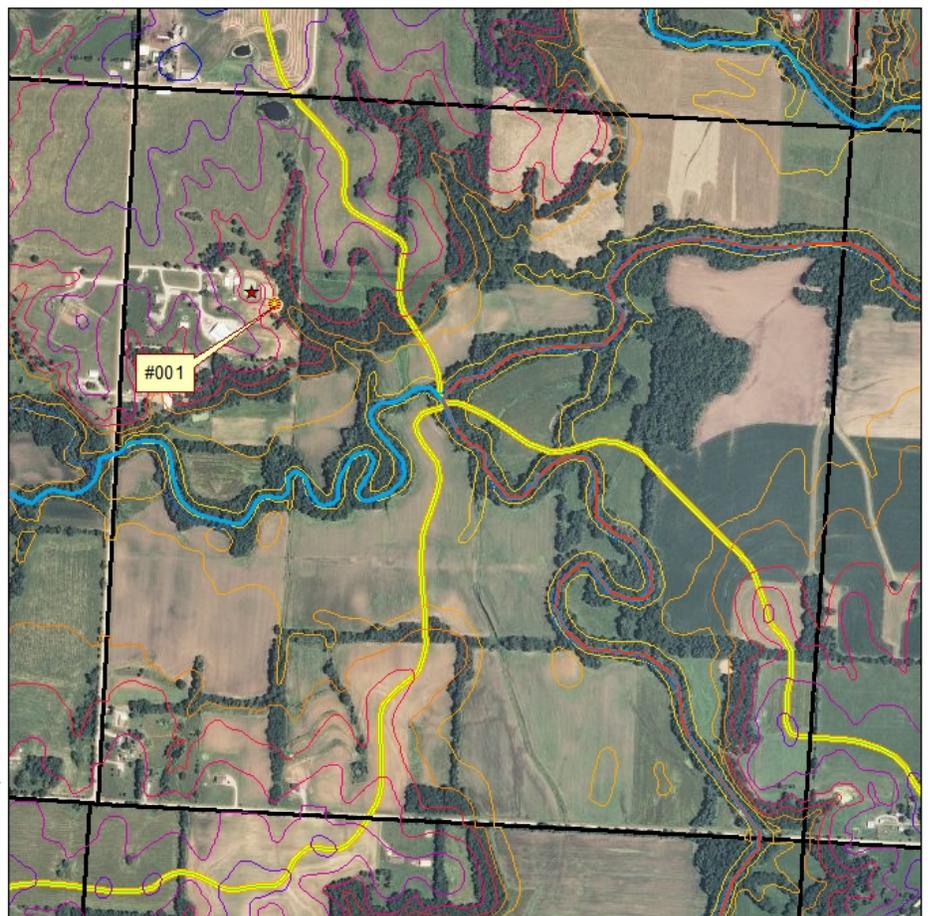
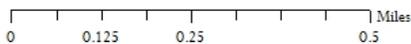
RP - Reasonable Potential. It is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

Reasonable Potential Analysis was conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version, including calculations, is available upon request.

**APPENDIX B – FACILITY LOCATION MAP:**

MO-0122823

Show-Me Christian Youth Home



MO-0122823  
 Show-Me Christian Youth Home  
 NE ¼, SW ¼, NW ¼, Sec. 34, T46N, R23W, Pettis County  
 UTM: X = 461422, Y = 4287002  
 Tributary to Long Branch (U)  
 1st Class: Long Branch (P) (01843)  
 Huc12: (10300103-0402)  
 EDU: Central Plains/Blackwater /Lamine