

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-0131296
Owner:	City of Troy
Address:	800 E. Cap Au Gris, Troy, MO 63379
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Troy Southeast Wastewater Treatment facility
Facility Address:	1011 Bueneman Lane, Troy, MO 63379
Legal Description:	See Page 2
UTM Coordinates:	See Page 2
Receiving Stream:	See Page 2
First Classified Stream and ID:	See Page 2
USGS Basin & Sub-watershed No.:	See Page 2

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


**FACILITY DESCRIPTION**

See Page 2

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 621.250 RSMo, Section 640.013 RSMo and Section 644.051.6 of the Law.

July 1, 2019  
Effective Date

January 1, 2022  
Modification Date

  
Chris Wieberg, Director, Water Protection Program

March 31, 2024  
Expiration Date

**FACILITY DESCRIPTION (continued):**

Outfall #001 – POTW

The use or operation of this facility shall be by or under the supervision of a Certified A Operator.

Influent lift station / mechanical screen / extended aeration basins with anoxic zones / secondary clarifiers / tertiary filtration / ultraviolet disinfection / cascade aeration / aerobic sludge digestion / sludge storage / sludge is land applied.

Design population equivalent is 17,292.

Design flow is 1.87 MGD.

Actual flow is 1.5 MGD.

Design sludge production is 617 dry tons/year.

Legal Description:	Sec. 32, T49N, R01E, Lincoln County
UTM Coordinates:	X = 678983, Y = 4315005
Receiving Stream:	Cuivre River (P)
First Classified Stream and ID:	Cuivre River (P) (152)
USGS Basin & Sub-watershed No.:	(07110008-0403)

Permitted Feature INF – POTW

Influent Monitoring Location

Permitted Feature SM1 – Instream Monitoring

Instream monitoring location – Upstream – See Special Condition #16

Permitted Feature SM2 – Instream Monitoring

Instream monitoring location – Downstream – See Special Condition #16

OUTFALL #001	TABLE A-1. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
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 on <b>January 1, 2022</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: M						
Flow	MGD	*		*	once/weekday***	24 hr. total
Biochemical Oxygen Demand <sub>5</sub>	mg/L		15	10	once/week	composite**
Total Suspended Solids	mg/L		15	10	once/week	composite**
<i>E. coli</i> (Note 1, Page 4)	#/100mL		630	126	once/week	grab
Ammonia as N (Apr 1 – Sep 30) (Oct 1 – Mar 31)	mg/L	2.0 6.6		0.8 2.5	once/week	composite**
Oil & Grease	mg/L	15		10	once/month	grab
Copper, Total Recoverable	µg/L	32.1		16	once/month	composite**
Total Phosphorus	mg/L	*		*	once/month	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/month	composite**
Nitrites + Nitrates	mg/L	*		*	once/month	composite**
EFFLUENT PARAMETER	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units <sup>†</sup>	SU	6.0		9.0	once/week	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE <b>FEBRUARY 28, 2022</b> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
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 on <b>January 1, 2022</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Fluoride	mg/L	*		*	once/quarter <sup>†</sup>	composite**
Lead, Total Recoverable	µg/L	*		*	once/quarter <sup>†</sup>	composite**
Cadmium, Total Recoverable	µg/L	*		*	once/quarter <sup>†</sup>	composite**
Thallium, Total Recoverable	µg/L	*		*	once/quarter <sup>†</sup>	composite**
Selenium, Total Recoverable	µg/L	*		*	once/quarter <sup>†</sup>	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>APRIL 28, 2022</u> .						
EFFLUENT PARAMETER(S)			UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand <sub>5</sub> – Percent Removal (Note 2, Page 4)			%	85	once/quarter <sup>†</sup>	calculated
Total Suspended Solids – Percent Removal (Note 2, Page 4)			%	85	once/quarter <sup>†</sup>	calculated
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>APRIL 28, 2022</u> .						

\* Monitoring requirement only.

\*\* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

\*\*\* Once each weekday means: Monday, Tuesday, Wednesday, Thursday, and Friday.

† pH is measured in pH units and is not to be averaged.

‡ See table below for quarterly sampling requirements.

Quarterly Minimum Sampling Requirements			
Quarter	Months	Applicable Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 <sup>th</sup>
Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

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

Note 2 – Influent sampling is not required during periods of land application when the facility does not discharge effluent. Samples are to be collected prior to any treatment process. Percent Removal is calculated by the following formula: [(Average Influent – Average Effluent) / Average Influent] x 100% = Percent Removal. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample, composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

OUTFALL #001	TABLE A-3. WHOLE EFFLUENT TOXICITY FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
	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 on <u>July 1, 2019</u> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
	EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS
DAILY MAXIMUM			WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: WA						
Acute Whole Effluent Toxicity (Note 3)	TU <sub>a</sub>	*			once/year	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2020</u> .						
Limit Set: WC						
Chronic Whole Effluent Toxicity (Note 4)	TU <sub>c</sub>	*			once/permit cycle	composite**
<u>WET TEST</u> REPORTS SHALL BE SUBMITTED <u>ONCE PER PERMIT CYCLE</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2024</u> .						

\* Monitoring requirement only.

\*\* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

Note 3 – The Acute WET test shall be conducted once per year during the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 5<sup>th</sup> year of the permit cycle. See Special Condition #14 for additional requirements.

Note 4 –The Chronic WET test shall be conducted during the 4<sup>th</sup> year of the permit cycle. See Special Condition #15 for additional requirements.

PERMITTED FEATURE <u>INF</u>	TABLE B. INFLUENT MONITORING REQUIREMENTS					
The monitoring requirements shall become effective on <u>July 1, 2019</u> and remain in effect until expiration of the permit. The influent wastewater shall be monitored by the permittee as specified below:						
PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: IQ						
Biochemical Oxygen Demand <sub>5</sub>	mg/L	*		*	once/quarter <sup>‡</sup>	composite**
Total Suspended Solids	mg/L	*		*	once/quarter <sup>‡</sup>	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2019</u> .						
Limit Set: IM						
Ammonia as N	mg/L	*		*	once/month	composite**
Total Phosphorus	mg/L	*		*	once/month	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/month	composite**
Nitrites + Nitrates	mg/L	*		*	once/month	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>AUGUST 28, 2019</u> .						

\*\* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

‡ See table on Page 7 for quarterly sampling requirements.

PERMITTED FEATURE <u>SM1</u>	TABLE C-1. INSTREAM MONITORING REQUIREMENTS					
The monitoring requirements shall become effective on <u>July 1, 2019</u> and remain in effect until expiration of the permit. The stream shall be monitored by the permittee as specified below:						
PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM		MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: UM						
Ammonia as N	mg/L	*		*	once/month	grab
Total Phosphorus	mg/L	*		*	once/month	grab
Total Kjeldahl Nitrogen	mg/L	*		*	once/month	grab
Nitrites + Nitrates	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2019</u> .						

\* Monitoring requirement only.

PERMITTED FEATURE <u>SM2</u>	TABLE C-2. INSTREAM MONITORING REQUIREMENTS					
	The monitoring requirements shall become effective on <u>July 1, 2019</u> and remain in effect until expiration of the permit. The stream shall be monitored by the permittee as specified below:					
PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM		MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: DM						
Hardness, Total	mg/L	*		*	once/quarter <sup>‡</sup>	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2019</u> .						

\* Monitoring requirement only.

<sup>‡</sup> See table below for quarterly sampling

Quarterly Minimum Sampling Requirements			
Quarter	Months	Applicable Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 <sup>th</sup>
Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

#### D. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

## **E. SPECIAL CONDITIONS**

1. **Electronic Discharge Monitoring Report (eDMR) Submission System.** Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program. All reports uploaded into the system shall be reasonably named so they are easily identifiable, such as “WET Test Chronic Outfall 002 Jan 2023,” or “Outfall 004 Daily Data Mar 2025.”
  - (a) **eDMR Registration Requirements.** The permittee must register with the Department’s eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem>. Information about the eDMR system can be found at <https://dnr.mo.gov/water/business-industry-other-entities/reporting/electronic-discharge-monitoring-reporting-system-edmr>. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
  - (b) **Electronic Submissions.** To access the eDMR system, use the following link in your web browser: <https://apps5.mo.gov/mogems/welcome.action>. If you experience difficulties with using the eDMR system you may contact [edmr@dnr.mo.gov](mailto:edmr@dnr.mo.gov) or call 855-789-3889 or 573-526-2082 for assistance.
  - (c) **Waivers from Electronic Reporting.** The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: <https://dnr.mo.gov/document-search/electronic-discharge-monitoring-report-waiver-request-form-mo-780-2692>. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.
2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
  - (a) To 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 CWA, 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) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.
3. All outfalls must be clearly marked in the field. This does not include instream monitoring locations.
4. Report as no-discharge when a discharge does not occur during the report period. For instream samples, report as “no flow” if no stream flow occurs during the report period.
5. **Reporting of Non-Detects:**
  - (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
  - (b) See sufficiently sensitive test method requirements in Standard Conditions Part I, Section A, No. 4 regarding proper testing and method minimum levels used for sample analysis.
  - (c) The permittee shall not report a sample result as “Non-Detect” without also reporting the method minimum level of the test. Reporting as “Non Detect” without also including the method minimum level, will be considered failure to report, which is a violation of this permit.
  - (d) The permittee shall provide the “Non-Detect” sample result using the less than symbol and the method minimum level (e.g., <50 µg/L, if the method minimum level for the parameter is 50 µg/L).
  - (e) Where the permit contains a Department determined Minimum Quantification Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
  - (f) For the daily maximum, the facility shall report the highest value. If the highest value was a non-detect, use the less than “<” symbol and the laboratory’s highest method minimum level.
  - (g) For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.
  - (h) For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of “0” for all non-detects for that reporting period and report the average of all the results.



**E. SPECIAL CONDITIONS (continued)**

- (i) When *E. coli* is not detected above the method minimum level, the permittee must report the data qualifier signifying less than detection limit for that parameter (e.g., <1 #/100mL, if the method minimum level is 1 #/100mL). For reporting a geometric mean based on a mix of detected and non-detected values, use one-half of the detection limit (instead of zero) for non-detects when calculating geometric means.
  - (j) See the Fact Sheet Addendum Appendix - Non-Detect Example Calculations for further guidance.
6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
7. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the monitoring frequencies listed in 10 CSR 20-9. To request a modification of the operational control testing requirements listed in 10 CSR 20-9, the permittee shall submit a permit modification application and fee to the Department requesting a deviation from the operational control monitoring requirements. If the request is approved, the Department will modify the permit.
8. The permittee shall develop and implement a program for maintenance and repair of the collection system. The recommended guidance is the US EPA's Guide for Evaluating Capacity, Management, Operation, And Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (Document number EPA 305-B-05-002) or the Departments' CMOM Model located at <https://dnr.mo.gov/document-search/capacity-management-operations-maintenance-plan-editable-template>. For additional information regarding the Departments' CMOM Model, see the CMOM Plan Model Guidance document at <https://dnr.mo.gov/print/document-search/pub2574>.
- The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28<sup>th</sup>, for the previous calendar year. The report shall contain the following information:
- (a) A summary of the efforts to locate and eliminate sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
  - (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
  - (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.
9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the St. Louis Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem> or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.
10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.
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. An all-weather access road shall be provided to the treatment facility.
13. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and 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 waters.

**E. SPECIAL CONDITIONS (continued)**

14. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:
  - (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour, static, non-renewal toxicity tests with the following species:
    - The fathead minnow, *Pimephales promelas* (Acute Toxicity EPA Test Method 2000.0).
    - The daphnid, *Ceriodaphnia dubia* (Acute Toxicity EPA Test Method 2002.0).
  - (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
  - (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
  - (d) The Allowable Effluent Concentration (AEC) is 98%; the dilution series is: 98%, 49%, 24.5%, 12.25%, and 6.125%.
  - (e) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
  - (f) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of acute toxic units ( $TU_a = 100/LC_{50}$ ) reported according to the test methods manual chapter on report preparation and test review. The Lethal Concentration 50 Percent ( $LC_{50}$ ) is the effluent concentration that would cause death in 50 percent of the test organisms at a specific time.
15. Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows:
  - (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 7-day, static, renewal toxicity tests with the following species:
    - The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
    - The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).
  - (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
  - (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
  - (d) The Allowable Effluent Concentration (AEC) is 80%; the dilution series is: 100%, 80%, 40%, 20%, and 10%.
  - (e) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
  - (f) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of chronic toxic units ( $TU_c = 100/IC_{25}$ ) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration ( $IC_{25}$ ) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.
16. Receiving Water Monitoring Conditions
  - (a) The upstream and downstream receiving water samples should be collected at a point away from any influence of the effluent, where the water is visibly flowing down stream. In the event that a safe, accessible location is not present at the location(s) listed, a suitable location can be negotiated with the Department. Samples should be taken at least four feet from the bank or from the middle of the stream (whichever is less) and 6-inches below the surface if possible.
  - (b) When conducting in-stream monitoring, the permittee shall record observations that include: the time of day, weather conditions, unusual stream characteristics (e.g., septic conditions, algae growth, etc.), the stream segment (e.g., riffle, pool or run) from where the sample was collected. These observations shall be submitted with the sample results.
  - (c) Samples shall not be collected from areas with especially turbulent flow, still water or from the stream bank, unless these conditions are representative of the stream reach or no other areas are available for sample collection. Sampling should not be made when significant precipitation has occurred recently. The sampling event should be terminated and rescheduled if any of the following conditions occur:
    - If turbidity in the stream increases notably; or
    - If rainfall over the past two weeks exceeds 2.5 inches or exceeds 1 inch in the last 24 hours

**E. SPECIAL CONDITIONS (continued)**

- (d) Always use the correct sampling technique and handling procedure specified for the parameter of interest. Please refer to the latest edition of Standard Methods for the Examination of Water and Wastewater for further discussion of proper sampling techniques. All analyses must be conducted in accordance with an approved EPA method. Meters shall be calibrated immediately (within 1 hour) prior to the sampling event.
  - (e) Please contact the Department if you need additional instructions or assistance.
17. **Stormwater Pollution Prevention Plan (SWPPP):** A SWPPP must be developed and implemented within **180 days of the effective date** of the permit. Through implementation of the SWPPP, the permittee shall minimize the release of pollutants in stormwater from the facility to the waters of the state. The SWPPP shall be developed in consultation with the concepts and methods described in the following document: Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in February 2009.
- (a) The SWPPP must identify any stormwater outfall from the facility and Best Management Practices (BMPs) used to prevent or reduce the discharge of contaminants in stormwater. The stormwater outfalls shall either be marked in the field or clearly marked on a map and maintained with the SWPPP.
  - (b) The SWPPP must include a schedule and procedures for a once per month routine site inspection.
    - (1) The monthly routine inspection shall be documented in a brief written report, which shall include:
      - i. The person(s) conducting the inspection.
      - ii. The inspection date and time.
      - iii. Weather information for the day of the inspection.
      - iv. Precipitation information for the entire period since the last inspection.
      - v. Description of the discharges observed, including visual quality of the discharges (sheen, turbid, etc.).
      - vi. Condition of BMPs
      - vii. If BMPs were replaced or repaired.
      - viii. Observations and evaluations of BMP effectiveness.
    - (2) Any deficiency observed during the routine inspection must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report.
    - (3) The routine inspection reports must be kept onsite with the SWPPP and maintained for a period of five (5) years.
    - (4) The routine inspection reports shall be made available to Department personnel upon request.
  - (c) The SWPPP must include a schedule and procedures for a once per year comprehensive site inspection.
    - (1) The annual comprehensive inspection shall be documented in a written report, which shall include:
      - i. The person(s) conducting the inspection.
      - ii. The inspection date and time.
      - iii. Findings from the areas of your facility that were examined;
      - iv. All observations relating to the implementation of your control measures including:
        - 1. Previously unidentified discharges from the site,
        - 2. Previously unidentified pollutants in existing discharges,
        - 3. Evidence of, or the potential for, pollutants entering the drainage system;
        - 4. Evidence of pollutants discharging to receiving waters at all facility outfall(s), and the condition of and around the outfall, and
        - 5. Additional control measures needed to address any conditions requiring corrective action identified during the inspection.
      - v. Any required revisions to the SWPPP resulting from the inspection;
      - vi. Any incidence of noncompliance observed or a certification stating that the facility is in compliance with Special Condition E.20.
    - (2) Any deficiency observed during the comprehensive inspection must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report.
    - (3) The comprehensive inspection reports must be kept onsite with the SWPPP and maintained for a period of five (5) years.
    - (4) The comprehensive inspection reports shall be made available to Department personnel upon request.
  - (d) The SWPPP must be kept on-site and should not be sent to the Department unless specifically requested.
  - (e) The SWPPP must be reviewed and updated at a minimum once per permit cycle, as site conditions or control measures change.

**E. SPECIAL CONDITIONS (continued)**

18. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP.
- (a) Permittee shall adhere to the following minimum Best Management Practices (BMPs):
- (1) Minimize the exposure of industrial material storage areas, loading and unloading areas, dumpsters and other disposal areas, maintenance activities, and fueling operations to rain, snow, snowmelt, and runoff, by locating industrial materials and activities inside or protecting them with storm resistant coverings, if warranted and practicable.
  - (2) Provide good housekeeping practices on the site to prevent potential pollution sources from coming into contact with stormwater and provide collection facilities and arrange for proper disposal of waste products, including sludge.
  - (3) Implement a maintenance program to ensure that the structural control measures and industrial equipment is kept in good operating condition and to prevent or minimize leaks and other releases of pollutants.
  - (4) Prevent or minimize the spillage or leaks of fluids, oil, grease, fuel, etc. from equipment and vehicle maintenance, equipment and vehicle cleaning, or activities.
  - (5) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed.
  - (6) Provide stormwater runoff controls to divert, infiltrate, reuse, contain, or otherwise minimize pollutants in the stormwater discharge.
  - (7) Enclose or cover storage piles of salt or piles containing salt, used for deicing or other commercial or industrial purposes.
  - (8) Provide training to all employees who; work in areas where industrial materials or activities are exposed to stormwater, are responsible for stormwater inspections, are members of the Pollution Prevention Team. Training must cover the specific control measures and monitoring, inspection, planning, reporting and documentation requirements of this permit. Training is recommended annually for any applicable staff and whenever a new employee is hired who meets the description above.
  - (9) Eliminate and prevent unauthorized non-stormwater discharges at the facility.
  - (10) Minimize generation of dust and off-site tracking of raw, final, or waste materials by implementing appropriate control measures.

**Missouri Department of Natural Resources**  
**Fact Sheet Addendum**  
**For Construction Permit/Modification**  
**#MO-0131296**  
**Troy Southeast Wastewater Treatment Facility**

This addendum gives pertinent information regarding minor/simple modification(s) to the above listed operating permit for a public comment process. An addendum is not an enforceable part of a Missouri State Operating Permit.

**Part I – Proposed Construction**

Facility Description:

Influent lift station / mechanical screen / extended aeration basins with anoxic zones / secondary clarifiers / tertiary filtration / ultraviolet disinfection / cascade aeration / aerobic sludge digestion / sludge storage / sludge is land applied.

**Part II – Reason for the Modification**

This operating permit is hereby modified based on the changes made under Construction Permit CP0002008. The purpose of the construction project was to expand the treatment capacity to accept flow from the Troy Highway 47 WWTP and to meet anticipated growth through 2035 and to improve treatment capabilities to meet anticipated permitting requirements. Primary components of the new construction included the following:

- Upgrading the existing influent lift station with variable speed pumps
- Replacing headworks with a fine screen system
- Replacing the existing membrane bioreactor system with an extended aeration treatment system, including the aeration splitter and three aeration tanks with anoxic zones to assist in achieving ammonia limits
- Upgrading the aeration blowers
- 2 new secondary clarifiers, and associated secondary clarifier splitter box
- Effluent tertiary filters
- Upgrading the existing UV disinfection system
- Upgrading the existing cascade aeration

In addition, a lift station was constructed at the Troy Highway 47 WWTP and a force main/interceptor sewer was constructed to connect the lift station to the Southeast WWTP.

Permit limits established by the Water Quality and Antidegradation Review (WQAR) issued January 3, 2017, have been incorporated into the operating permit.

The Classification Worksheet for Operator Certification Level was updated, remaining at Level A, as presented in the Fact Sheet Addendum Appendix A.

Standard Condition Part III was updated to reflect the most current version.

Special Condition updates included the following:

- The special condition related to reporting through the Department's electronic discharge monitoring reporting (eDMR) system has been updated to reflect the new system.
- The non-detect special condition was updated to reflect language on how a facility reports non-detects on their discharge monitoring report and a Fact Sheet Addendum Appendix B with Non-Detect Example Calculations was added.

Links for the Department's website in the Special Conditions and Fact Sheet were updated to the new website links (also reference <https://dnr.mo.gov/forms-applications>).

## **Part III – Effluent Limitations and Monitoring Requirements**

### **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.

### **CHANGES TO EFFLUENT LIMITATIONS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
BOD <sub>5</sub>	mg/L	1		15	10	CBOD <sub>5</sub> 15/10	1/week	monthly	C
TSS	mg/L	1		15	10	20/15	1/week	monthly	C
Ammonia as N (Apr 1 – Sep 30)	mg/L	3, 4	2.0		0.8	8.1/1.6	1/week	monthly	C
(Oct 1 – Mar 31)	mg/L	3, 4	6.6		2.5	12.3/2.4	1/week	monthly	C
Copper, Total Recoverable	µg/L	3	32.1		16	*/*	1/month	monthly	C
Fluoride	mg/L	4, 7	*		*	*/* Hwy 47	1/quarter	quarterly	C
Lead, Total Recoverable	µg/L	4	*		*	20.8/12.1 Hwy 47	1/quarter	quarterly	C
Cadmium, Total Recoverable	µg/L	4	*		*	*/* Hwy 47	1/quarter	quarterly	C
Thallium, Total Recoverable	µg/L	4	*		*	*/* Hwy 47	1/quarter	quarterly	C
Selenium, Total Recoverable	µg/L	4	*		*	*/* Hwy 47	1/quarter	quarterly	C

\* - Monitoring requirement only.

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

\*\*\* - Parameter not previously established in previous state operating permit.

\*\*\*\* - C = 24-hour composite  
G = Grab  
T = 24-hr. total  
E = 24-hr. estimate  
M = Measured/calculated

#### **Basics for Limitations Codes:**

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

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

See the WQAR included as a Fact Sheet Addendum Appendix C for Effluent Limit Derivation.

The limits for a few parameters were updated based on revised regulatory requirements and information in renewed permits for both the Troy Southeast Wastewater Treatment Facility (MO-0131296) and the Troy Highway 47 Wastewater Treatment Facility (MO-0054632). The following describes the derivation of limits that differed from those in the WQAR:

- **Escherichia coli (E. coli)**. The limit of 630 #/100mL was changed from a Daily Maximum Limit to a Weekly Average, as the Daily Maximum Limit is required for non-POTWs and the Weekly Average is used for POTWs. [10 CSR 20-7.015(9)(B); 40 CFR 122.45(d)]
- **Total Nitrogen**. Effluent monitoring for Total Nitrogen has been revised to the speciated parameters of Total Kjeldahl Nitrogen and Nitrite + Nitrate, as required per 10 CSR 20-7.015(9)(D)8.
- **Aluminum, Total Recoverable**. The WQAR had included Aluminum, Total Recoverable, because it was included in the draft 2016 Troy HWY 47 WWTF NPDES Permit. However, for the renewal of the Troy Highway 47 WWTF permit (MO-0054623) effective July 1, 2019, a Reasonable Potential Analysis was performed and determined the facility had no reasonable potential to cause or contribute to an excursion of the standard. Therefore, this parameter has been removed. The permit is still protective of water quality and this determination will be reassessed at the time of renewal.

- **Zinc, Total Recoverable.** The WQAR had included Zinc, Total Recoverable, because it was included in the draft 2016 Troy HWY 47 WWTF NPDES Permit. However, for the renewal of the Troy Highway 47 WWTF permit (MO-0054623) effective July 1, 2019, a Reasonable Potential Analysis was performed and determined the facility had no reasonable potential to cause or contribute to an excursion of the standard. Therefore, this parameter has been removed. The permit is still protective of water quality and this determination will be reassessed at the time of renewal.
- **Fluoride.** Water quality based limits were calculated in the WQAR as a Daily Maximum of 7.8 mg/L and a Monthly Average of 3.9 mg/L for Protection of Livestock and wildlife watering. The Draft Operating Permit Modification that was on public notice from October 15, 2018 to November 14, 2018, identified that Fluoride would be monitored, so this monitoring requirement will be retained. This determination will be reassessed at the time of renewal.
- **Whole Effluent Toxicity (WET).** The WQAR included Acute WET monitoring once per year. The Southeast WWTF renewal added a Chronic WET test in place of the Acute WET test during the 4<sup>th</sup> year of the permit cycle. No changes were made to the existing WET testing requirements in this modification.

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

### **ANTI-BACKSLIDING:**

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(o); 40 CFR Part 122.44(l)] 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 Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.
- ✓ Material and substantial alterations or additions to the permitted facility occurred after permit issuance, which justify the application of a less stringent effluent limitation.

### **ANTIDEGRADATION:**

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)], for domestic wastewater discharge with new, altered, or expanding discharges, the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. In accordance with Missouri's water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See <https://dnr.mo.gov/document-search/antidegradation-implementation-procedure>

- ✓ This permit contains new and/or expanded discharge; please see **APPENDIX C FOR THE WATER QUALITY AND ANTIDEGRADATION REVIEW.**

### **OPERATOR CERTIFICATION REQUIREMENTS:**

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], the permittee shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.020(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems with population equivalents greater than 200 and are owned or operated by or for municipalities, public sewer districts, counties, public water supply districts, private sewer companies regulated by the Public Service Commission and state or federal agencies.

- ✓ This facility is required to have a certified operator as it has a population equivalent greater than 200 and is owned or operated by or for a municipality, public sewer district, county, public water supply district, private sewer company regulated by the PSC, state or federal agency.

This facility currently requires a chief operator with an A Certification Level. Please see **Appendix - Classification Worksheet.** Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator's Name: Jared Comer  
Certification Number: 14415  
Certification Level: WW-A

Operator's Name: Michael Rosen  
Certification Number: 12193  
Certification Level: WW-A

The listing of the operators above only signifies that staff drafting this operating permit have reviewed appropriate Department records and determined that the operators identified by the City has the correct and applicable Certification Level.

## **Part V – 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 modification was from October 15, 2018 to November 14, 2018. No comments were received.

**DATE OF FACT SHEET:** DECEMBER 14, 2021

### **COMPLETED BY:**

**GINNY BRETZKE, P.E., ENVIRONMENTAL ENGINEER**  
**MISSOURI DEPARTMENT OF NATURAL RESOURCES**  
**WATER PROTECTION PROGRAM**  
**FINANCIAL ASSISTANCE CENTER**  
**ginny.bretzke@dnr.mo.gov**

**APPENDIX A – OPERATOR CLASSIFICATION WORKSHEET**

**APPENDIX B – NON-DETECT EXAMPLE CALCULATIONS**

**APPENDIX C – WATER QUALITY AND ANTIDegradation REVIEW**



## Appendices

### APPENDIX A- CLASSIFICATION WORKSHEET:

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Maximum Population Equivalent (P.E.) served (Max 10 pts.)	1 pt./10,000 PE or major fraction thereof.	1.7
Maximum: 10 pt Design Flow (avg. day) or peak month; use greater (Max 10 pts.)	1 pt. / MGD or major fraction thereof.	2.6
<b>EFFLUENT DISCHARGE RECEIVING WATER SENSITIVITY:</b>		
Missouri or Mississippi River	0	-
All other stream discharges except to losing streams and stream reaches supporting whole body contact	1	-
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	-
Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	3
<b>PRELIMINARY TREATMENT - Headworks</b>		
Screening and/or comminution	3	3
Grit removal	3	-
Plant pumping of main flow (lift station at the headworks)	3	3
<b>PRIMARY TREATMENT</b>		
Primary clarifiers	5	
Combined sedimentation/digestion	5	
Chemical addition (except chlorine, enzymes)	4	
<b>REQUIRED LABORATORY CONTROL – performed by plant personnel (highest level only)</b>		
Push – button or visual methods for simple test such as pH, Settleable solids	3	-
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5	-
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	7
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	-
<b>ALTERNATIVE FATE OF EFFLUENT</b>		
Direct reuse or recycle of effluent	6	6
Land Disposal – low rate	3	-
High rate	5	-
Overland flow	4	-
Total from page <b>ONE (1)</b>	----	26.3

**APPENDIX A- CLASSIFICATION WORKSHEET (CONTINUED):**

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
<b>VARIATION IN RAW WASTE (highest level only) (DMR exceedances and Design Flow exceedances)</b>		
Variation do not exceed those normally or typically expected	0	-
Recurring deviations or excessive variations of 100 to 200 % in strength and/or flow	2	-
Recurring deviations or excessive variations of more than 200 % in strength and/or flow	4	-
Raw wastes subject to toxic waste discharge	6	-
<b>SECONDARY TREATMENT</b>		
Trickling filter and other fixed film media with secondary clarifiers	10	-
Activated sludge with secondary clarifiers (including extended aeration and oxidation ditches)	15	15
Stabilization ponds without aeration	5	-
Aerated lagoon	8	-
Advanced Waste Treatment Polishing Pond	2	-
Chemical/physical – without secondary	15	-
Chemical/physical – following secondary	10	10
Biological or chemical/biological	12	12
Carbon regeneration	4	-
<b>DISINFECTION</b>		
Chlorination or comparable	5	-
Dechlorination	2	-
On-site generation of disinfectant (except UV light)	5	-
UV light	4	4
<b>SOLIDS HANDLING - SLUDGE</b>		
Solids Handling Thickening	5	5
Anaerobic digestion	10	-
Aerobic digestion	6	6
Evaporative sludge drying	2	-
Mechanical dewatering	8	-
Solids reduction (incineration, wet oxidation)	12	-
Land application	6	6
Total from page <b>TWO (2)</b>	----	58
Total from page <b>ONE (1)</b>	---	26.3
Grand Total	---	84.3

- ☒ - A: 71 points and greater  
☐ - B: 51 points – 70 points  
☐ - C: 26 points – 50 points  
☐ - D: 0 points – 25 points

## APPENDIX B – NON-DETECT EXAMPLE CALCULATIONS:

**Example:** Permittee has four samples for Pollutant X which has a method minimum level of 5 mg/L and is to report a Daily Maximum and Monthly Average.

Week 1 = 11.4 mg/L  
Week 2 = Non-Detect or <5.0 mg/L  
Week 3 = 7.1 mg/L  
Week 4 = Non-Detect or <5.0 mg/L

For this example, use subpart (h) - For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of “0” for all non-detects for that reporting period and report the average of all the results.

$$11.4 + 0 + 7.1 + 0 = 18.5 \div 4 \text{ (number of samples)} = 4.63 \text{ mg/L.}$$

The Permittee reports a Monthly Average of 4.63 mg/L and a Daily maximum of 11.4 mg/L (Note the < symbol was dropped in the answers).

**Example:** Permittee has five samples for Pollutant Y that has a method minimum level of 9 µg/L and is to report a Daily Maximum and Monthly Average.

Day 1 = Non-Detect or <9.0 µg/L  
Day 2 = Non-Detect or <9.0 µg/L  
Day 3 = Non-Detect or <9.0 µg/L  
Day 4 = Non-Detect or <9.0 µg/L  
Day 5 = Non-Detect or <9.0 µg/L

For this example, use subpart (g) - For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.

$$(9 + 9 + 9 + 9 + 9) \div 5 \text{ (number of samples)} = <9 \text{ µg/L.}$$

The Permittee reports a Monthly Average of <9.0 µg/L (retain the ‘less than’ symbol) and a Daily Maximum of <9.0 µg/L.

**Example:** Permittee has four samples for Pollutant Z where the first two tests were conducted using a method with a method minimum level of 4 µg/L and the remaining two tests were conducted using a different method that has a method minimum level of <6 µg/L and is to report a Monthly Average and a Weekly Average.

Week 1 = Non-Detect or <4.0 µg/L  
Week 2 = Non-Detect or <4.0 µg/L  
Week 3 = Non-Detect or <6.0 µg/L  
Week 4 = Non-Detect or <6.0 µg/L

For this example, use subpart (g) - For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.

$$(4 + 4 + 6 + 6) \div 4 \text{ (number of samples)} = <5 \text{ µg/L. (Monthly)}$$

The facility reports a Monthly Average of <5.0 µg/L and a Weekly Average of <6.0 µg/L.

**Example:** Permittee has five samples for Pollutant Z where the first two tests were conducted using a method with a method minimum level of 4 µg/L and the remaining three tests were conducted using a different method that has a method minimum level of <6 µg/L and is to report a Monthly Average and a Weekly Average.

Week 1 = Non-Detect or <4.0 µg/L  
Week 2 = Non-Detect or <4.0 µg/L  
Week 2 = Non-Detect or <6.0 µg/L

## APPENDIX B– NON-DETECT EXAMPLE CALCULATIONS (CONTINUED):

Week 3 = Non-Detect or <6.0 µg/L  
Week 4 = Non-Detect or <6.0 µg/L

For this example, use subpart (g) - For reporting an average based on all non-detected values, remove the “<” sign from the values, average the values, and then add the “<” symbol back to the resulting average.

$$(4 + 4 + 6 + 6 + 6) \div 5 \text{ (number of samples)} = <5.2 \text{ } \mu\text{g/L. (Monthly)}$$
$$(4 + 6) \div 2 \text{ (number of samples)} = <5 \text{ } \mu\text{g/L. (Week 2)}$$

The facility reports a Monthly Average of  $<5.2 \text{ } \mu\text{g/L}$  and a Weekly Average of  $<6.0 \text{ } \mu\text{g/L}$  (report highest Weekly Average value)

**Example:** Permittee has four samples for Pollutant Z where the tests were conducted using a method with a method minimum level of  $10 \text{ } \mu\text{g/L}$  and is to report a Monthly Average and Daily Maximum. The permit lists that Pollutant Z has a Department determined Minimum Quantification Level (ML) of  $130 \text{ } \mu\text{g/L}$ .

Week 1 =  $12 \text{ } \mu\text{g/L}$   
Week 2 =  $52 \text{ } \mu\text{g/L}$   
Week 3 = Non-Detect or  $<10 \text{ } \mu\text{g/L}$   
Week 4 =  $133 \text{ } \mu\text{g/L}$

For this example, use subpart (h) - For reporting an average based on a mix of detected and non-detected values (not including *E. coli*), assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

$$\text{For this example, } (12 + 52 + 0 + 133) \div 4 \text{ (number of samples)} = 197 \div 4 = 49.3 \text{ } \mu\text{g/L.}$$

The facility reports a Monthly Average of  $49.3 \text{ } \mu\text{g/L}$  and a Daily Maximum of  $133 \text{ } \mu\text{g/L}$ .

**Example:** Permittee has five samples for *E. coli* which has a method minimum level of 1 #/100mL and is to report a Weekly Average (seven (7) day geometric mean) and a Monthly Average (thirty (30) day geometric mean).

Week 1 = 102 #/100mL  
Week 2 (Monday) = 400 #/100mL  
Week 2 (Friday) = Non-Detect or  $<1 \text{ #/100mL}$   
Week 3 = 15 #/100mL  
Week 4 = Non-Detect or  $<1 \text{ #/100mL}$

For this example, use subpart (i) - When *E. coli* is not detected above the method minimum level, the permittee must report the data qualifier signifying less than detection limit for that parameter (e.g.,  $<1 \text{ #/100mL}$ , if the method minimum level is 1 #/100mL). For reporting a geometric mean based on a mix of detected and non-detected values, use one-half of the detection limit (instead of zero) for non-detects when calculating geometric means. The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected.

$$\text{The Monthly Average (30 day Geometric Mean)} = 5\text{th root of } (102)(400)(0.5)(15)(0.5) = 5\text{th root of } 153,000 = 10.9 \text{ #/100mL.}$$
$$\text{The 7 day Geometric Mean} = 2\text{nd root of } (400)(0.5) = 2\text{nd root of } 200 = 14.1 \text{ #/100mL. (Week 2)}$$

The Permittee reports a Monthly Average (30 day Geometric Mean) of  $10.9 \text{ #/100mL}$  and a Weekly Average (7 day geometric mean) of  $102 \text{ #/100mL}$  (report highest Weekly Average value)

APPENDIX C—WATER QUALITY AND ANTIDEGRADATION REVIEW



Jeremiah W. (Jay) Nixon, Governor • Harry D. Bozorian, Director

## DEPARTMENT OF NATURAL RESOURCES

dnr.mo.gov

JAN 03 2017

The Honorable Mark Cross, Mayor  
City of Troy  
800 Cap-Au-Gris  
Troy, MO 63379

Re: Water Quality and Antidegradation Review Preliminary Determination for City of Troy,  
Southeast Wastewater Treatment Facility Upgrades, Antidegradation Application, Activity #226,  
MO-0131296, Lincoln County

Dear Mayor Cross:

Enclosed please find the finalized Water Quality and Antidegradation Review (WQAR) for the *City of Troy, Southeast Wastewater Treatment Facility Upgrades, Antidegradation Application* dated August 18, 2016 for in Lincoln County. The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations, and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Implementation Procedure* (AIP) dated July 13, 2016, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources' initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

You may proceed with submittal of an application for an operating permit and antidegradation review public notice, an engineering report, or a complete application for a construction permit. The WQAR would also allow you to pursue construction of one of the other approved reasonable alternatives without the need to modify this antidegradation review. However, if this alternative is considered a new technology, your construction permit must address the approvability of the design in accordance with the factsheet *Approval Process for Innovative Technology* available at <http://dnr.mo.gov/pubs/pub2453.htm>. With a new technology you will need to work with the construction permit review engineer to ensure equipment is sized properly and that the technology will consistently achieve the proposed effluent limits. The department encourages the use of new methods and treatment innovations. These submittals must



The Honorable Mark Cross, Mayor  
Page 2

reflect the design flow, facility description, and general treatment components of this WQAR or this preliminary determination may have to be revisited. To reduce cost and time spent scanning permit applications, plans, and specification, the Water Protection Program's Engineering Section has begun asking for electronic copies of submitted documents in addition to paper copies. While it is not currently a requirement, submittal of electronic documents on a compact disc or other removable electronic media is being proposed in the new rulemaking for 10 CSR 20-6.010. If you have any questions regarding the new technology factsheet, please contact the engineering section of the Water Protection Program.

Following the department's public notice of a draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and determinations will be considered final.

Following issuance of the construction permit and completion of the actual facility construction, the department will proceed with the issuance of the operating permit.

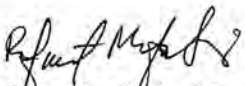
**Notice to Permittees:** On August 22, 2013, the Environmental Protection Agency (EPA) published a notice in the Federal Register announcing the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, *Final 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 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 begun discussions about how these new criteria will be implemented. WPP is suggesting that all permittees consider the lower ammonia criteria and adjust the alternative analysis or 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.htm>.

If you should have questions regarding the enclosed WQAR, please contact Mr. Todd Blanc by telephone at 314-416-2064 by e-mail at [todd.blanc@dnr.mo.gov](mailto:todd.blanc@dnr.mo.gov), or by mail at the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102.

Sincerely,

WATER PROTECTION PROGRAM



Refaat Mefrakis, P.E., Chief  
Engineering Section

RM:tbk

Enclosure

c: Mr. Robert T. Polys, P.E., Woodard & Curran  
Mr. Ryan Peasel, Wastewater Department Superintendent-City of Troy

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

## **Water Quality and Antidegradation Review**

*For the Protection of Water Quality  
and Determination of Effluent Limits for Discharge to  
Cuivre River*

*by  
City of Troy SE Wastewater Treatment Facility*



December, 2016

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## 1. FACILITY INFORMATION

FACILITY NAME: City of Troy SE WWTF NPDES #: MO0131296

FACILITY TYPE: POTW – SIC #4952

FACILITY DESCRIPTION: The current southeast facility (SE WWTF) is a Membrane Bioreactor (MBR) treatment technology. The facility's existing configuration has caused operational challenges for the City's staff. The design average flow of the SE WWTF is 1.0 million gallons per day (MGD). The second facility is the Highway 47 Wastewater Treatment Facility (HWY 47 WWTF). This facility uses an Extended Aeration (OXIGEST®) type treatment system. The HWY 47 WWTF is at the end of its useful life and does not have sufficient capacity to accommodate peak flows. This has led to overflows to the surrounding receiving waters. The design average flow of the HWY 47 WWTF is 1.3 MGD. The facility has an EPA Administrative Order to make changes to the plant to meet effluent limits and reduce bypasses and wet weather related problems. The proposed project is to transfer all influent flow of the HWY 47 WWTF and treat all flows at the SE WWTF site with a subsequent average daily design flow of 1.87 MGD that discharges to the Cuivre River. This shift of flows will provide improved treatment and permit compliance to mitigate the overflows which have historically occurred at the HWY 47 WWTF. The chosen alternative is Alternative #1, the Conventional Activated Sludge (CAS) with tertiary filtration which costs 5% more than the present worth of the base technology.

COUNTY: Lincoln UTM COORDINATES: X= 678983/ Y= 4315005  
12- DIGIT HUC: 07110008-0403 LEGAL DESCRIPTION: NE ¼, NW ¼, SW ¼, Sec. 32, T49N, R1E  
EDU\*: Central Plains/ Cuivre/ Salt ECOREGION: Plains

\* - Ecological Drainage Unit

## 2. WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (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, and revised July 13, 2016, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

### 2.1. WATER QUALITY HISTORY:

There are no 303 (d) or 305 (b) listings for this section of the Cuivre River. The St. Louis Regional Office (SLRO) issued a letter of warning to the SE WWTF for exceeding ammonia in July 2014. The SE WWTF was last inspected on 5/21/2014 and found to be in compliance.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	2.9	Secondary	Cuivre River	0

## 3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Cuivre River	P	0152	1.17	1.50	2.15	LWW, WWH, AQL, WBC-A, SCR, General Criteria

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

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RECEIVING WATER BODY SEGMENT #1: Cuivre River  
Upper end segment\* UTM coordinates: X= 678983/ Y= 4315005 (Outfall)  
Lower end segment\* UTM coordinates: X=680800 / Y= 4314715 (Outfall + 6010 feet)

\*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.

Note: The above segment was determined based on the aide of the Streeter Phelps model and GIS mapping. While the Streeter Phelps model indicated that degradation continued 12,000 feet downstream of the outfall, three Class C stream contribute to the flow of the river and further dilute the effluent flow. For these reasons the above lower segment was determined to be 0.15 miles downstream of the third Class C tributary. This **Administrative Record of Decisions** shall be made available all interagency and public participation opportunities during an antidegradation review. This record shall also serve as a historical reference for subsequent antidegradation reviews involving the same water segment.

#### 4. GENERAL COMMENTS

Woodard & Curran prepared, on behalf of City of Troy, *The City of Troy, Missouri, Southeast Wastewater Treatment Facility Upgrades. Antidegradation Application* dated August 15, 2016, and revised November 11, 2016. The 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.

The applicant-submitted dissolved oxygen modeling (Appendix C) analysis was revised and updated by Water Protection Program staff. Staff believes that the results of the model are protective of the water quality standards for dissolved oxygen.

Information that was provided by the applicant in the submitted report and summary forms in Appendix D was used to develop this review document.

According to the Geohydrologic Evaluation conducted by Missouri Geological Survey, the receiving stream is gaining for discharge purposes (Appendix A: Map).

A Missouri Department of Conservation (MDC) Natural Heritage Review was obtained by the applicant, and records of federally-listed bat species and state-listed (not federal-listed) endangered fish species were found for the project area. The MDC provided recommendations to the applicant to avoid impacting the habitat of these endangered species. Appendix B contains the first page of the Heritage Review Report that was provided by MDC.

#### 5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *City of Troy, Missouri, Southeast Wastewater Treatment Facility Upgrades. Antidegradation Application* dated August 15, 2016, and revised November 11, 2016.

##### 5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix D: Attachment A). Pollutants of concern are defined as those pollutants "proposed for discharge that affects beneficial use(s) in waters of the state. The 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 D).

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TABLE 1. POLLUTANTS OF CONCERN AND TIER DETERMINATION

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
BOD <sub>5</sub> /DO	2	Significant	
Total Suspended Solids (TSS)	**	Significant	
Ammonia	2	Significant	
pH	2***	Significant	Permit limits applied
<i>Escherichia coli</i> ( <i>E. coli</i> )	2	Significant	Permit limits applied
Oil & Grease	2	Significant	
Total Nitrogen	**	Significant	10 CSR 20-7.015 applied
Total Phosphorus	**	Significant	10 CSR 20-7.015 applied
Lead	2	Significant	
Fluoride	2	Significant	
Copper	2	Significant	
Zinc	2	Significant	
Aluminum	2	Significant	
Cadmium	2	Significant	
Thallium	2	Significant	
Selenium	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 D were used by the applicant:  
For pollutants of concern, the attachments are:

☒ Attachment A, Tier 2 with significant degradation.

## 5.2. EXISTING WATER QUALITY

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

## 5.3. NO-DISCHARGE EVALUATION

According to 10 CSR 20-6.010 (4)(D), reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no-discharge facility. Because Missouri's antidegradation implementation procedures specify that if the proposed activity results in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Part of that analysis as shown below is the non-degrading or no discharge evaluation. Land application was evaluated as the no discharge evaluation; however, land application was deemed impracticable for reasons described below. See Section 5.4.1 discussion for the regionalization alternative.

### 5.3.1. NO-DISCHARGE EVALUATION FACTORS

While a no-discharge system may not be a feasible alternative for every system, it is important that no-discharge options are properly considered and evaluated. For cases in which regionalization or land application are not chosen, these decisions must be sufficiently justified. The design flow for this project (1.87 MGD) would involve an extremely large land application system. The report describes non-degrading alternative #1 (surface irrigation) and alternative #2 (subsurface irrigation) with SE WWTF and HWY 47 WWTF still combined; however, the SE WWTF would still retain its existing discharge of 1.0 MGD but any flow in excess of 1.0 MGD would be stored and then applied to land (see Appendix E).

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Projects with design flows of greater than 0.2 MGD are generally considered very large for land application and the costs associated with this option exceed that of other well-designed alternatives. For this project, the storage lagoon would have to be sized at 56 acres with a depth of 10 feet and an associated estimated land application area of at least 450 acres would be needed. While no total capital cost for non-degrading alternative #1 or #2 was estimated, the applicant surmised that land purchase for application, SE WWTF upgrades, 1 or 2 pump stations, equipment to land apply and construction of lines to and from storage, etc. would be cost prohibitive. The largest expenses being earthwork for the lagoon, land acquisition, lagoon sealant, lift stations, and the center pivot. For these reasons it has been determined that no-discharge is not economically efficient and not warranted for this project. See Appendix E for more detailed information.

#### 5.4. 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. For this permitted discharge, eleven (11) alternatives from non-degrading to less degrading to degrading alternatives were evaluated.

Non-degrading alternatives included: 1) surface land application, 2) subsurface land application, 3) recycle or re-use, 4) connection to a regional facility, 5) discharge to an alternative location, 6) improved operation and maintenance of existing WWTF, and 7) upgrade the Troy SE WWTF and HWY 47 WWTF. All non-degrading alternatives were eliminated as impracticable.

Surface or subsurface land application would require construction of a 56-acre lagoon and approximately 450 acres of land to apply wastewater at an application rate of 0.06 inches per hour. Surface application and subsurface disposal is also considered to be impractical because of the large amount of land which would be required to be purchased by the City. Recycling or re-use projects that involve treated WWTF effluent going to golf courses for irrigation, washing of trucks or groundwater recharge may result in further degradation of the environment. For these reasons, recycling/re-use of treated effluent is considered to be impractical for upgrades to the SE WWTF (see Appendix E). Connection to a regional facility is covered in Section 5.4.1. Alternative discharge location is considered impractical for upgrades to the SE WWTF as an effluent pump station and transmission pipe line would add additional up-front capital cost and operational costs for the City. Due to the lack of existing treatment capacity for permit compliance, alternative #6-improved operations and maintenance of the existing Troy SE WWTF is considered impractical. According to the submitted report, the improved operation and maintenance alternative still would require upgrade to the SE WWTF to accommodate the additional flow. The conclusion of the alternatives analysis was that operating both the HW 47 WWTF and SE WWTF was not economically viable for the City, therefore upgrading both the Troy SE WWTF and HWY 47 WWTF is not consider practicable.

According to the AIP, only those alternatives that are considered practicable are included in the economic efficiency analysis. Four practical degrading alternatives were evaluated in Table 2. The base case treatment project is the Conventional Activated Sludge (CAS) system. These CAS systems are suspended-growth treatment processes, which consist of a series of reactors (tanks) or separate zones within common tanks for biological treatment including BOD removal and nutrient removal. The CAS base project will also use internal mixed liquor recycle flow to an anoxic selector zone, a swing zone, and it will include provisions for cyclic aeration to manage the nitrate loading to the secondary clarification process. According to the submitted antidegradation application, the base CAS alternative is capable of compliance with current effluent limitations and all pollutants of concern. The base CAS project includes a low rate and long SRT treatment process with anoxic selector zones which provides well settling sludge, low SVIs, low effluent TSS, low effluent BOD and low effluent ammonia. The longer SRT process produces improved BOD removal and facilitates nitrification. The combination of the selector zones, a more stable low-rate treatment process and the provisions to add supplemental polymer (see the note at the end of



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Section 10.2) for settling assistance are the reasons for the base project being proposed to meet water quality requirements.

As shown in the table below, the membrane bioreactor (MBR) and conventional activated sludge (CAS) with Tertiary Filtration & Chemical Addition alternatives far exceed the 120% threshold of the base project (conventional activated sludge (CAS)) and thus are not economically viable alternatives. The CAS with Tertiary Filtration alternative is 105% of the base project cost and thus this less-degrading treatment alternative is economically viable. Less-Degrading CAS with Tertiary Filtration, Alternative #1, includes all of the same systems, unit processes, upgrades and components described previously as part of the Base CAS alternative. With this alternative, there is an additional tertiary filtration unit process. The tertiary filtration system is located downstream of the secondary clarification process and upstream of the UV disinfection process.

The analysis as shown in Table 2 indicates that the return on environmental benefits with increasing cost of treatment did not justify more expenditure beyond the CAS with Tertiary Filtration treatment alternative as Alternative #1 (see Appendix D, Attachment A).

Table 2. Economic Efficiency and Alternative Present Worth Cost Analysis Comparison for City of Troy SE WWTF

Parameter	Conventional Activated Sludge (CAS) Base Case	CAS with Tertiary Filtration	Membrane Bioreactor	CAS with Tertiary Filter & Chemicals
BOD <sub>5</sub> (mg/L)	10	<10	<5	>5-10
TSS (mg/L)	<15	<15	<1	>5-10
DO (mg/L) (Min)	>5	>5	>5	>5
Ammonia (mg/L) <sup>(2)</sup>	<1	<1	<1	<1
Oil & Grease (mg/L)	<10	<10	<7	<10
E. Coli <sup>(6)</sup>	<126	<126	<126	<126
Copper (TR) <sup>(5)</sup>	>50% Removal	50-75% Removal	50-90% Removal <sup>(4)</sup>	70-90% Removal
Other Metals (TR) <sup>(5)</sup>	>50% Removal	50-75% Removal	50-90% Removal <sup>(4)</sup>	80-90% Removal
Fluoride <sup>(3)</sup>	PLA	PLA	PLA	PLA
Practicability	Yes	Yes	Yes	Yes
Total Present Worth <sup>(1)</sup>	\$ 23,290,000	\$ 24,370,000	\$ 32,300,000	\$ 36,290,000
Total Annual Costs	\$ 564,000	\$ 570,000	\$ 760,000	\$ 1,010,000
Base-to-Alternative Cost Ratio	1.00	1.05	1.39	1.56
Economic Efficiency	Economically Efficient	Economically Efficient	Not Economically Efficient	Not Economically Efficient

1. 20-Year Design Life & 1.2% interest rate. Present worth factor of 17.69
2. All technologies will meet ammonia water quality standards in receiving stream. All alternatives are designed as low rate longer SRT treatment processes designed to achieve full nitrification
3. Permit Limits Achievable (PLA)
4. Metals can create Inorganic Fouling. Typically, 50-90% removal efficiency depending on the metal.
5. Total Recoverable (TR)
6. E. Coli limits are expressed as a monthly geometric mean during the recreational season from April 1<sup>st</sup> to October 30<sup>th</sup>

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#### 5.4.1. REGIONALIZATION ALTERNATIVE

Within Section II B 1. of the AIP, discussion of the potential for discharge to a regional wastewater collection system is mentioned. The Troy SE WWTF will be acting as the regional WWTF for the City. There are no treatment facilities in the immediate area that could take and treat the additional flow from the City. City of Moscow Mills is located in close proximity to the SE WWTF site. The current average day flow of this WWTF is approximately 40,000 gpd. This two-cell lagoon facility does not have the capacity or treatment capabilities to accommodate 1.87 MGD of flow from the City of Troy without a complete plant upgrade.

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

#### 5.4.2. LOSING STREAM ALTERNATIVE DISCHARGE LOCATION

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

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

#### 5.4.3. SOCIAL AND ECONOMIC IMPORTANCE EVALUATION

The Mayor of the City of Troy submitted a letter that described the affected community, City of Troy, and reasons for allowing the degradation of the discharge segment of the Cuivre River (see Appendix D). In the attached letter, relevant social and economic factors were identified including the need to attract new business and industry, address population growth, increase in employment, and protect human health and the environment with improvements to the wastewater system. The degradation of the Cuivre River is necessary in order to maintain City of Troy's current social and economic conditions. Appendix D, Attachment A: Tier 2 with Significant Degradation form contains a summary of this information and the letter from the mayor.

### 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.

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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).** One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile [10 CSR 20-7.031(5)(A)4.B.(II)(a)].

**Zone of Initial Dilution (ZID).** One-tenth (0.1) of the mixing zone volume of flow [10 CSR 20-7.031(5)(A)4.B.(II)(b)].

### MIXING CONSIDERATIONS TABLE:

MIXING ZONE (CFS) [10 CSR 20-7.031(4)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(4)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
0.2925	0.375	0.5375	0.02925	0.0375	0.05375

$$AEC\% = \left( \frac{100}{DilutionRatio + 1} \right) \quad \text{Acute AEC}\% = ((2.9 + ZID_{7Q10 \text{ or } 0.0375}) / 2.9)^{-1} \times 100 = 99\%$$

## 8. PERMIT LIMITS AND MONITORING INFORMATION

WASTELoad ALLOCATION  
STUDY CONDUCTED (Y OR N):

☐ N

USE ATTAINABILITY  
ANALYSIS CONDUCTED (Y OR N):

☐ N

WHOLE BODY CONTACT  
USE RETAINED (Y OR N):

☐ Y

### OUTFALL #001

WET TEST (Y OR N): ☐ Y FREQUENCY: ONCE/YEAR AEC: 99% METHOD: MULTIPLE

Table 3. Effluent Limits Outfall 001

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 2)	MONITORING FREQUENCY
FLOW	MGD	*		*		ONCE/WEEK
BIOCHEMICAL OXYGEN DEMAND <sub>5</sub> ***	MG/L		15	10	FSR/PEL	ONCE/WEEK
TOTAL SUSPENDED SOLIDS***	MG/L		15	10	FSR/PEL	ONCE/WEEK
PH	SU	6.0-9.0		6.0-9.0	FSR	ONCE/WEEK
AMMONIA AS N (APRIL 1 - SEPT 30)	MG/L	2.0		0.8	PEL/WQBEL	ONCE/WEEK
AMMONIA AS N (OCT 1 - MARCH 30)	MG/L	6.6		2.5	PEL/WQBEL	ONCE/WEEK
ESCHERICHIA COLIFORM (E. COLI)	NOTE 1	630**		126**	FSR	ONCE/WEEK
OIL & GREASE	MG/L	15		10	FSR	ONCE/WEEK
FLUORIDE	MG/L	7.8		3.9	WQBEL	ONCE/QUARTER
COPPER	µG/L	32.1		16.0	WQBEL	ONCE/MONTH
TOTAL NITROGEN	MG/L	*		*	FSR	ONCE/QUARTER
TOTAL PHOSPHORUS	MG/L	*		*	FSR	ONCE/QUARTER
LEAD	µG/L	*		*	NA	ONCE/QUARTER

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ZINC	μG/L	*	*	NA	ONCE/QUARTER
ALUMINUM	μG/L	*	*	NA	ONCE/QUARTER
CADMIUM	μG/L	*	*	NA	ONCE/QUARTER
THALLIUM	μG/L	*	*	NA	ONCE/QUARTER
SELENIUM	μG/L	*	*	NA	ONCE/QUARTER
WET TESTING	TU	*	*	FSR	ONCE PER YEAR

NOTE 1 – COLONIES/100 ML

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

- \* Monitoring requirements only.
- \*\* The Monthly and Weekly Average for *E. coli* shall be reported as a Geometric Mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).
- \*\*\* This facility is required to meet a removal efficiency of 85% or more for BOD<sub>5</sub> and TSS. Influent BOD<sub>5</sub> and TSS data should be reported to ensure removal efficiency requirements are met.

## 9. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

## 10. DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations and limits were calculated using two methods:

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

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

Where C = downstream concentration

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

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

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

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

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

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

2) Alternative Analysis-based – Using the preferred alternative's treatment capacity for conventional pollutants such as BOD<sub>5</sub> 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



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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 BOD<sub>5</sub> and TSS effluent values that could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average BOD<sub>5</sub> and TSS effluent values that could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

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

##### 10.2. LIMIT DERIVATION

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD<sub>5</sub>).** Alternative #1 proposed BOD<sub>5</sub> limits of 10 mg/L monthly average, 15 mg/L average weekly limits. The 2009 DO Modeling & BOD Effluent Limit Development Guidance states that 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).

WPP Staff conducted a desktop Streeter Phelps evaluation of the proposed discharge to the Cuivre River (Appendix C). To demonstrate protection of beneficial uses within the River, Staff used 12 mg/L CBOD<sub>5</sub> and 1.1 mg/L ammonia as the maximum value to calculate NBOD (as 5.0 mg/L) as input to the Streeter Phelps analysis. This model showed the DO deficient is insignificant as the time to recover the DO deficient is nearly instantaneous. The modeled lowest dissolved oxygen sag was 5.0 mg/L.

**As a result of this analysis, MDNR staff concludes that the above mentioned effluent limits are protective of beneficial uses and existing water quality.**

The permittee requested carbonaceous biochemical oxygen demand (CBOD); however, the regulations in 20-7.015 (8) (A) 5 state that "when a wastewater treatment facility causes nitrification which affects the BOD reading, the permittee may petition the department to substitute CBOD in lieu of regular BOD testing. ...." We have not established CBOD for this new facility without discharge monitoring data.

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

- **Total Suspended Solids (TSS).** 10 mg/L monthly average, 15 mg/L average weekly limit. According to EPA, because TSS and BOD are closely correlated, we apply the same limits for TSS as BOD. Influent monitoring may be required for this facility in its Missouri State Operating Permit.
- **pH.** – 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.
- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

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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:  $C_e = (2.9 \text{ cfs} + 0.5375 \text{ cfs}) * 1.5 - (0.5375 \text{ cfs} * 0.01 \text{ mg/L}) / 2.9 \text{ cfs}$   
 $C_e = 1.78 \text{ mg/L}$

Acute WLA:  $C_e = (2.9 \text{ cfs} + 0.02925 \text{ cfs}) * 12.1 - (0.02925 \text{ cfs} * 0.01 \text{ mg/L}) / 2.9 \text{ cfs}$   
 $C_e = 12.2 \text{ mg/L}$

$LTA_c = 1.78 \text{ mg/L} (0.780) = 1.39 \text{ mg/L}$  [CV = 0.6, 99<sup>th</sup> Percentile, 30 day avg.]  
 $LTA_a = 12.2 \text{ mg/L} (0.321) = 3.91 \text{ mg/L}$  [CV = 0.6, 99<sup>th</sup> Percentile]

MDL =  $1.39 \text{ mg/L} (3.11) = 4.3 \text{ mg/L}$  [CV = 0.6, 99<sup>th</sup> Percentile]  
 AML =  $1.39 \text{ mg/L} (1.19) = 1.6 \text{ mg/L}$  [CV = 0.6, n=30, 95<sup>th</sup> Percentile]

#### Winter

Chronic WLA:  $C_e = (2.9 \text{ cfs} + 0.5375 \text{ cfs}) * 3.1 - (0.5375 \text{ cfs} * 0.01 \text{ mg/L}) / 2.9 \text{ cfs}$   
 $C_e = 3.67 \text{ mg/L}$

Acute WLA:  $C_e = (2.9 \text{ cfs} + 0.02925 \text{ cfs}) * 12.1 - (0.02925 \text{ cfs} * 0.01 \text{ mg/L}) / 2.9 \text{ cfs}$   
 $C_e = 12.2 \text{ mg/L}$

$LTA_c = 3.67 \text{ mg/L} (0.780) = 2.87 \text{ mg/L}$  [CV = 0.6, 99<sup>th</sup> Percentile, 30 day avg.]  
 $LTA_a = 12.2 \text{ mg/L} (0.321) = 3.92 \text{ mg/L}$  [CV = 0.6, 99<sup>th</sup> Percentile]

MDL =  $2.87 \text{ mg/L} (3.11) = 8.4 \text{ mg/L}$  [CV = 0.6, 99<sup>th</sup> Percentile]  
 AML =  $2.87 \text{ mg/L} (1.19) = 3.2 \text{ mg/L}$  [CV = 0.6, 95<sup>th</sup> Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	4.0	1.5
Winter	8.9	3.4

**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.

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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. The department has begun discussions about how these new criteria will be implemented. The WPP is suggesting that all permittees consider the lower ammonia criteria and adjust the alternative analysis or 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.htm>.

*EPA's Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013.*  
Mussels Present Criteria

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	0.7	3.4
Winter	6	7.8	2.3	13

Using the 2013 EPA Ammonia Criteria, the above low flows, default multipliers, and background ammonia data, the following are estimated limitations that would apply to the proposed discharge:

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	2.0	0.8
Winter	6.6	2.5

Because our objective in the antidegradation review process using the alternative analysis is to protect existing water quality, ammonia's water quality-based effluent limit (WQBEL) will be compared to the treatment capacity values provided by the applicant in Table 2 and in Attachment A. The preferred alternative effluent limits (PEL) below are more stringent than water quality based limits that are developed using the early life stages of fish. To express this technology-based treatment capacity (PELs) we need to establish both summer and winter limit values. The assumed summer limit values shown below are close to the WQBEL established for the mussel criteria. In addition, the PELs are slightly less stringent than the WQBELs that were developed using EPA's mussel criteria, therefore we will apply the summer and winter WQBELs based upon the 2013 EPA Ammonia criteria as shown above.

**Total Ammonia Nitrogen.** The preferred Alternative #1 treatment capacity as a monthly average (AML) was 1 mg/L as shown in Table 2. These values are assumed to be achievable in the summer.

$$\begin{aligned} \text{AML} &= 1 \text{ mg/L} \\ \text{LTA} &= \text{AML} / 1.19 = 0.84 \text{ mg/L} \\ \text{MDL} &= 0.84 \text{ mg/L} \times 3.11 = 2.6 \text{ mg/L} \quad [\text{CV} = 0.6, 99\text{th Percentile}] \end{aligned}$$

- ***Escherichia coli (E. coli)***. Monthly average of 126 per 100 mL as a geometric mean and Daily Maximum of 630 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(5)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d).

#### **Whole Effluent Toxicity**

- **Acute Whole Effluent Toxicity**. Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards.

Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

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$$\text{Acute AEC\%} = \{[(2.9 + 0.0375) / 2.9]^{-1}\} \times 100 = 99.0\%$$

- **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.
- **Fluoride.** Protection of Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection) Chronic Criteria = 4 mg/L, or 4,000 µg/L.

$$\text{Chronic WLA: } C_e = ((2.9 \text{ cfs} + 0.5375 \text{ cfs}) 4000 - (0.5375 \text{ cfs} * 10 \text{ µg/L})) / 2.9 \text{ cfs}$$

$$C_e = 4739.5 \text{ µg/L}$$

$$\text{LTAc} = 4739.5 \text{ µg/L} (0.5274) = 2797.7 \text{ µg/L} \quad [\text{CV} = 0.6, 99\text{th Percentile}]$$

$$\text{MDL} = 2497.7 (3.11) = 7767.9 \text{ µg/L} (7.8 \text{ mg/L}) \quad [\text{CV} = 0.6, 99\text{th Percentile}]$$

$$\text{AML} = 2497.7 (1.55) = 3871.4 \text{ µg/L} (3.9 \text{ mg/L}) \quad [\text{CV} = 0.6, 95\text{th Percentile}, n = 4]$$

### Metals

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion" (EPA 823-B-96-007). General warm-water fishery criteria apply and water hardness = 200 mg/L. Hardness was determined from data submitted with the Antidegradation Report. In the City of Troy Antideg Application, 2012 samples were taken at the Southeast WWTF to determine the hardness of the Cuivre River. The average hardness from these samples was determined to be 215. The 25<sup>th</sup> percentile of hardness was calculated to be 200 mg/L.

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and adsorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable (TR) metals, dissolved metals, hardness, and total suspended solids are provided to the department, partitioning evaluations may be considered and site-specific translators developed.

METAL	CONVERSION FACTORS	
	ACUTE	CHRONIC
Copper	0.960	0.960

- **Copper, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 16 µg/L, Acute Criteria = 26 µg/L. A hardness value of 200 mg/L was used to determine the water quality standards for metals including copper. The copper conversion factors are not hardness dependent, however.

$$\text{TR Chronic} = 16.0 / 0.960 = 16.7 \text{ µg/L}$$

$$\text{TR Acute} = 26.0 / 0.960 = 27.1 \text{ µg/L}$$

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

$$C_e = ((2.9 \text{ cfs} + 0.5375 \text{ cfs}) \times \text{criteria} - (0.5375 \text{ cfs} * 0.01 \text{ mg/L})) / 2.9 \text{ cfs}$$

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Chronic WLA:  $C_e = ((2.9 \text{ cfs} + 0.5375 \text{ cfs}) 16.7 - (0.5375 \text{ cfs} * 0.01 \text{ mg/L}))/2.9 \text{ cfs}$

$C_e = 19.8 \text{ } \mu\text{g/L}$

Acute WLA:  $C_e = ((2.9 \text{ cfs} + 0.5375 \text{ cfs}) 27.1 - (0.5375 \text{ cfs} * 0.01 \text{ mg/L}))/2.9 \text{ cfs}$

$C_e = 32.1 \text{ } \mu\text{g/L}$

$LTA_o = 19.8 \text{ } \mu\text{g/L} (0.527) = 10.4 \text{ } \mu\text{g/L}$

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

$LTA_a = 32.1 \text{ } \mu\text{g/L} (0.321) = 10.3 \text{ } \mu\text{g/L}$

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

$MDL = 10.3 \text{ } \mu\text{g/L} (3.11) = 32.1 \text{ } \mu\text{g/L}$

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

$AML = 10.3 \text{ } \mu\text{g/L} (1.55) = 16.0 \text{ } \mu\text{g/L}$

[CV = 0.6, 95<sup>th</sup> Percentile, n = 4]

- **Lead, Total Recoverable.** Monitoring requirement only. As established in the draft 2016 Troy HWY 47 WWTF NPDES Permit.
- **Zinc, Total Recoverable.** Monitoring requirement only. As established in the draft 2016 Troy HWY 47 WWTF NPDES Permit.
- **Aluminum, Total Recoverable.** Monitoring requirement only. As established in the draft 2016 Troy HWY 47 WWTF NPDES Permit.
- **Cadmium, Total Recoverable.** Monitoring requirement only. As established in the draft 2016 Troy HWY 47 WWTF NPDES Permit.
- **Thallium, Total Recoverable.** Monitoring requirement only. As established in the draft 2016 Troy HWY 47 WWTF NPDES Permit.
- **Selenium, Total Recoverable.** Monitoring requirement only. As established in the draft 2016 Troy HWY 47 WWTF NPDES Permit.

Note: Please be aware that additive usage at wastewater treatment facilities is not prohibited unless their use is expected to result in a change in effluent quality. Because the antidegradation review mentioned the use of additives to enhance treatment, please see the following factsheet: <http://dnr.mo.gov/pubs/pub2653.htm>.

The 10-day review of this document provided a list of the additives that are normally used to improve treatment and enhance process control. The additives will not change the nature of the treated effluent per the comment letter from Woodard and Curran that was received on December 16, 2016.




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#### 11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION


The proposed new facility discharge, City of Troy SE WWTF, 1.87 MGD will result in significant degradation of the segment identified in Cuivre River. Conventional Activated Sludge (CAS) 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 was evaluated, and the Conventional Activated Sludge (CAS) with Tertiary Filtration, Alternative #1 was found to be cost effective and was determined to be the preferred alternative.

Because, as shown in Table 3 above, the effluent limitations are likely the same for all treatments, it has been determined that the other treatment options presented in Table 2 may also be considered reasonable alternatives provided they are designed to be capable of meeting the effluent limitations developed based on the preferred alternative, Alternative #1. If any of these options are selected, you may proceed with the appropriate facility plan, construction permit application, or other future submittals without the need to modify this Antidegradation review document.

Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. The 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: Todd Blanc 


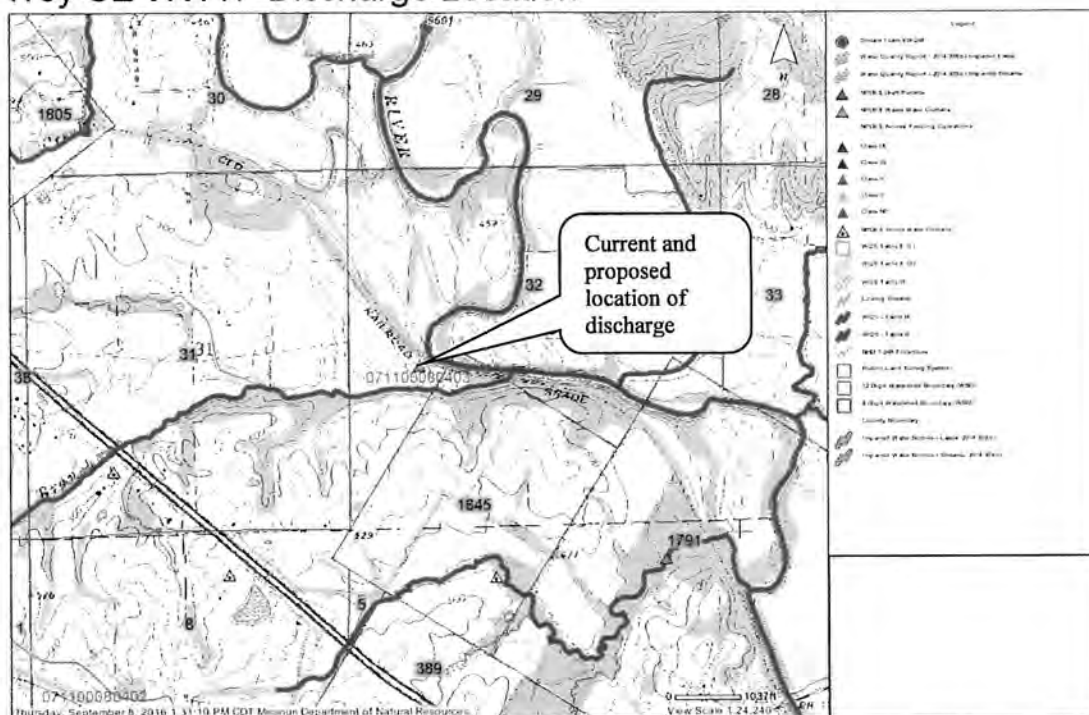
Date: December 2, 2016

Unit Chief: John Rustige, P.E. 

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## APPENDIX A: MAP OF CURRENT AND PROPOSED DISCHARGE LOCATION


## Troy SE WWTF Discharge Location


Missouri  
Department of  
Natural Resources

Disclaimer: Although this map has been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.

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APPENDIX B: NATURAL HERITAGE REVIEW

	<p align="center"><b>Missouri Department of Conservation</b> <b>Natural Heritage Review Report</b> <i>January 8, 2016 -- Page 1 of 2</i></p>		<p>Resource Science Division P. O. Box 180 Jefferson City, MO 65102 Prepared by: Brittne Brauner Brittne.Brauner@mdc.mo.gov (573) 522 -- 4115 ext. 3182</p>
<p><b>ROBERT POLYS</b> <b>WOODARD &amp; CURRAN</b> <b>41 HUTCHINS DR.</b> <b>PORTLAND, ME 04102</b></p>	<p>Project type: Location/Scope: County: Query reference: Query received:</p>	<p><b>WASTEWATER</b> <b>T49N R01E S30-32 &amp; 19</b> <b>LINCOLN</b> <b>TROY WWTF</b> <b>12/16/2015</b></p>	
<p><small>This NATURAL HERITAGE REVIEW is <u>not</u> 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 <a href="http://mdc.mo.gov/discover-nature/places-go/natural-areas">http://mdc.mo.gov/discover-nature/places-go/natural-areas</a> and <a href="http://mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx">mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx</a>.</small></p>			
<p><b>Level 3 issues: Records of <u>federal-listed</u> (these are also state-listed) species or critical habitats near the project site:</b></p> <p>Natural Heritage records identify Northern long-eared bats (<i>Myotis septentrionalis</i>, federal-listed threatened) occur approximately 4.6 miles from the "Project Work Area." Northern long-eared bats hibernate during winter months in caves and mines. During the summer months, they roost and raise 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) for further coordination.</p> <p><small>FEDERAL LIST species/habitats are protected under the Federal Endangered Species Act. Contact the U.S. Fish and Wildlife Service (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; 573-234-2132) for Endangered Species Act coordination and concurrence information.</small></p>			
<p><b>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.</b></p> <p>Natural Heritage records identify occurrences of Ghost Shiner (<i>Notropis bethanyana</i> state-ranked S2; Imperiled) 2 miles upstream and downstream from the SE Wastewater Treatment Outfall.</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>			



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**APPENDIX C: STREETER PHELPS MODEL RESULTS BASED ON PROPOSED CAS WITH TERTIARY FILTRATION'S DESIGN FLOW**

**Model Inputs:**

**Effluent Characteristics:**

SE WWTF BOD5 – the maximum value was assumed to be the treatment capacity of Alternative #1 – CAS with Tertiary Filtration = 20 mg/l. Therefore, approximately, CBOD = 10 mg/l and NBOD = 5 mg/L (based on a 1.1 mg/L NH3 effluent)

SE WWTF Effluent Dissolved Oxygen = 5 mg/L

SE WWTF Effluent Flow = 1.87 MGD (2.89 cfs)

SE WWTF Summer Temperature = 24.0 °C (DMR Data)

**Receiving stream Characteristics:**

Cuivre River 7Q10 Flow Mixing Zone Flow = 0.375 cfs, Troy SE WWTF NPDES Permit.

Cuivre River Summer Temperature = 25.1 °C, *Cuivre River Water Quality and Receiving Stream Assessment (CRWQRSA)*, MEC Water Resources Inc, and See Appendix A Site W6, Page 30, Table 8.

Cuivre River Summer Background CBOD = 4.8 mg/L, See Appendix A - CRWQRSA, MEC Water Resources Inc, Site W6, Page 30, Table 8.

Cuivre River Summer Background NBOD = 2 mg/L (\*assumed based on NH3 value in effluent characteristics)

Cuivre River Summer Background DO = 8 mg/L as the 50% Percentile. See Page 38, Figure 33, CRWQRSA, MEC Water Resources Inc, and See Appendix A Site W6, Page 30, Table 8.

Elevation – topographic map.

Downstream slope, channel depth, velocity – Used CRWQRSA, Table 11, Site H1 to Site H2 values and verified velocity estimate with the Manning's N equation:  $V = 1.49/n(R)^{2/3} (s)^{1/2}$ .

For both the reaeration and decay rate coefficients, we reviewed applicant provided values. The values provided below considered the applicant provided, CRWQRSA, and model equation values.

Reaeration Rate:  $K_r$  = Reoxygenation (Reaeration), (days<sup>-1</sup>) - Owens equation results as guide to apply a **rate of 1.3**. According to CRWQRSA, Page 43, reaeration rates calculated internally by the WASP model using the Owens-Gibbs equation compared favorably with field estimates obtained from continuous dissolved oxygen using the Delta Method (Chapra and Ditoro 1991).

Decay Rate:  $K_d$  = Deoxygenation (BOD Decay), (days<sup>-1</sup>) - Used the CRWQRSA, Table 14, Page 44 CBOD decay as guide to apply a **rate of 0.25**.

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Streeter-Phelps analysis of critical dissolved oxygen sag.

**INPUT**

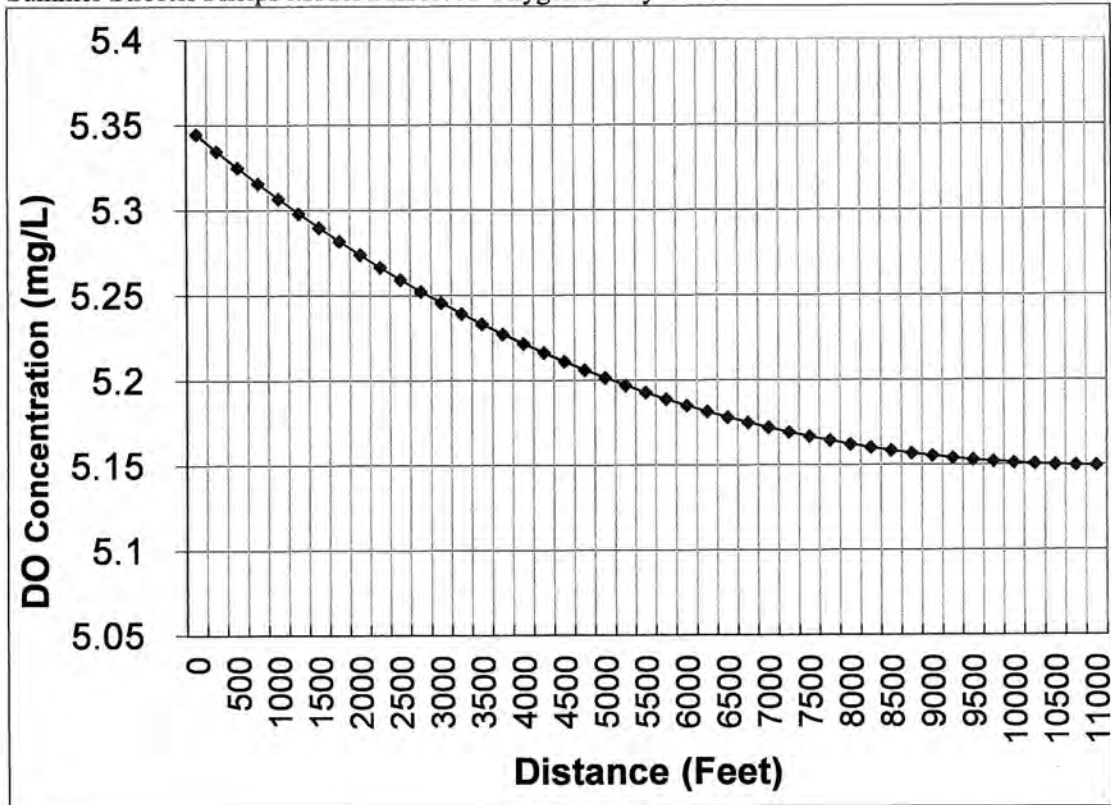
<b>1. EFFLUENT CHARACTERISTICS</b>			
Discharge (cfs):			2.89
CBOD5 (mg/L):			10
Ammonia as Nitrogen (mg/L):			1.1
NBOD (mg/L):			5.027
Dissolved Oxygen (mg/L):			5
Temperature (deg C):			24
<b>2. RECEIVING WATER CHARACTERISTICS</b>			
Upstream Discharge (cfs):			0.375
Upstream CBOD5 (mg/L):			4.8
Upstream NBOD (mg/L):			2
Upstream Dissolved Oxygen (mg/L):			8
Upstream Temperature (deg C):			25.1
Elevation (ft NGVD):			460
Downstream Average Channel Slope (ft/ft):			0.0014
Downstream Average Channel Depth (ft):			2.75
Downstream Average Channel Velocity (fps):			0.24
<b>3. REAERATION RATE (Base e) AT 20 deg C (day<sup>-1</sup>):</b>			<b>Applicable value below here:</b>
			1.30
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	0.54
O'Connor and Dobbins	.1 - 1.5	2 - 50	1.39
Owens	.1 - 6	1 - 2	1.28
Tsivoglou-Wallace	.1 - 6	.1 - 2	2.32
<b>4. BOD DECAY RATE (Base e) AT 20 deg C (day<sup>-1</sup>):</b>			<b>0.25</b>
Reference			Suggested Value
Wright and McDonnell, 1979			0.48

**OUTPUT**

<b>1. INITIAL MIXED RIVER CONDITION</b>	
CBOD5 (mg/L):	9.4
NBOD (mg/L):	4.7
Dissolved Oxygen (mg/L):	5.3
Temperature (deg C):	24.1
<b>2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)</b>	
Reaeration (day <sup>-1</sup> ):	1.43
BOD Decay (day <sup>-1</sup> ):	0.30
<b>3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU</b>	
Initial Mixed CBODU (mg/L):	13.8
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	18.5
<b>4. INITIAL DISSOLVED OXYGEN DEFICIT</b>	
Saturation Dissolved Oxygen (mg/L):	8.261
Initial Deficit (mg/L):	2.92
<b>5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):</b>	
	0.587812
<b>6. DISTANCE TO CRITICAL DO CONCENTRATION (feet):</b>	
	12188.87
<b>7. CRITICAL DO DEFICIT (mg/L):</b>	
	3.27
<b>8. CRITICAL DO CONCENTRATION (mg/L):</b>	
	5.00

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Summer Streeter Phelps Model Dissolved Oxygen Decay Curve.



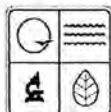
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**APPENDIX D: ANTIDEGRADATION REVIEW SUMMARY ATTACHMENTS**

The attachments that follow contain summary information provided by the applicant, City of Troy WWTF. MoDNR staff determined that no changes must be made to the information contained within these attachments.

- 1) Attachment A: No changes needed.
- 2) Letter from the City of Troy is attached to supplement the Social and Economic Benefits Section of the WQAR.

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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**

<b>1. FACILITY</b>			
NAME Southeast Wastewater Treatment Facility (SE WWTF)		TELEPHONE NUMBER WITH AREA CODE (636) 528-4712	
ADDRESS (PHYSICAL) 1011 Bueneman Lane	CITY Troy	STATE MO	ZIP CODE 63379
<b>2. OWNER</b>			
NAME AND OFFICIAL TITLES City of Troy - Mayor			
ADDRESS 800 Cap Au Gris	CITY Troy	STATE MO	ZIP CODE 63379
TELEPHONE NUMBER WITH AREA CODE (636) 528-4712		E-MAIL ADDRESS mcross@cityoftroymissouri.com	
<b>3. CONTINUING AUTHORITY</b> The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at <a href="http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf">www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf</a> .			
NAME AND OFFICIAL TITLES City of Troy - Mayor			
ADDRESS 800 Cap Au Gris	CITY Troy	STATE MO	ZIP CODE 63379
TELEPHONE NUMBER WITH AREA CODE (636) 528-4712		E-MAIL ADDRESS mcross@cityoftroymissouri.com	
<b>4. RECEIVING WATER BODY SEGMENT #1</b>			
NAME Cuivre River			
4.1 UPPER END OF SEGMENT (Location of discharge) UTM _____ OR Lat _____, Long _____		UTM Coordinates: X=678983.359 Y=4315005.487	
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."			
<b>5. WATER BODY SEGMENT #2 (IF APPLICABLE, Use another form if a third segment is needed)</b>			
NAME			
5.1 UPPER END OF SEGMENT UTM _____ OR Lat _____, Long _____			
5.2 LOWER END OF SEGMENT UTM _____ OR Lat _____, Long _____			
<b>6. WET WEATHER ANTICIPATIONS</b>			
If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to the antidegradation review report.			
What is the Wet Weather Flow Peaking Factor in relation to design flow? - Wet Weather PF = 3.76			
Wet Weather Design Summary: The SE WWTF is a flow through process which will accommodate the peak flow conditions without operator intervention. The facility will include provisions for Step-Feed or Contact Stabilization high flow operating modes.			

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#### 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: A previous study was referenced. The previous study had an MDNR Approved QAPP.

#### 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	Waste load Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	MG/L		10 (15 Weekly)	
TSS	MG/L		15 (20 Weekly)	
DISSOLVED OXYGEN	MG/L		5.0	5.0 (Daily Minimum)
AMMONIA	MG/L		1.6 (Summer) & 3.1 (Winter)	4.3 (Summer) & 8.2 (Winter)
BACTERIA (E. COLI)	CFUS		126 (630 Weekly)	
TOTAL RESIDUAL CHLORINE	ug/L		<130	<130
FLUORIDE	mg/L		3.7	7.2
Oil & Grease	mg/L		10	15
TOTAL RECOV. COPPER	ug/L		28.8	46.9

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 *New Technology Definitions and Requirements Factsheet* that can be found at <http://dnr.mo.gov/pubs/pub2453.pdf>.

Non-degrading alternatives: Land Application, Subsurface Disposal, Improved O&M, Recycle/Reuse, Regional WWTF, etc.

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	TSS	AMMONIA AS N	Oil & Grease	E. Coli	DO
	(MG/L)	MG/L	MG/L	mg/L	#/100 mL	mg/L
Activated Sludge (CAS)	<10	<15	<5	<10	<126	>5.0
CAS + Filtration	<10	<15	<2	<10	<126	>5.0
CAS+Filtration+Chemicals	<5-10	<5-10	<1-2	<10	<126	>5.0
MBR	<5	<1	<1	<7	<126	>5.0



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#### 10. DETERMINATION OF THE REASONABLE ALTERNATIVE

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.**

##### Practicability Summary:

"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.

Only one of the less-degrading alternatives (CAS+Filtration) was considered to be practical, reliable and economical for the City. The CAS+Filtration+Chemical Addition and the MBR Alternatives were both considered to be impractical and not cost effective alternatives for the City. All of the non-degrading alternatives were considered to be impractical for the proposed project.

##### Economic Efficiency Summary:

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.

The economic efficiency of the less-degrading alternatives was evaluated. The CAS and CAS Filtration alternatives were deemed to be economically viable for the City. The CAS with Tertiary Filtration & Chemical Addition and MBR alternatives were greater than 120% of the base CAS project cost. Thus these two less-degrading alternatives were considered to be not economically viable for the City. All of the non-degrading alternatives were considered to be impractical for the proposed project.

##### Affordability Summary:

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."

Both the CAS and CAS with Tertiary Filtration alternatives were considered viable for the SE WWTF upgrade. The more environmentally protective of the two (CAS+Filtration) is recommended for the SE WWTF upgrades.

##### Preferred Chosen Alternative:

The CAS with Tertiary Filtration alternative is recommended for the SE WWTF upgrades. This alternative will ensure more consistent and reliable treatment as compared to the base CAS project. This alternative is also economically viable.

##### Reasons for Rejecting the other Evaluated Alternatives:

The other less-degrading and non-degrading alternatives were determined to be impractical based upon their lack of economic efficiency, lack of economic viability and lack of feasibility.

##### Comments/Discussion:

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# 11. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

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.

## 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 affected community is considered to be the City of Troy.

## 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 City has seen a 56% increase in its population over the past decade. It is anticipated that the population will continue to grow into the future. The City has seen an increase in commercial and residential development as result of the increased population. The median income in the city of Troy is above the state median income. Reliable and robust wastewater treatment is a critical factor to supporting the continuing growth in the City while also ensuring protection of the surrounding environment.

## 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.

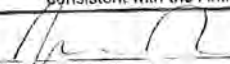
With reliable wastewater treatment in place, the City will be able to allow more residential and commercial development while also protecting the surrounding water quality. This will help to attract new development and employers which can provide quality and reliable jobs to the citizens of Troy and the surrounding communities. In addition, the recommended alternative will not require the city to purchase more land. This allows more land to be used for growth and development within the City.

## PROPOSED PROJECT SUMMARY:

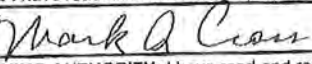
The city of Troy, MO currently operates two WWTFs, the Highway 47 WWTF (HW 47 WWTF) and the SE WWTF. This proposed project incorporates the decommissioning of the HW 47 WWTF and consolidating treatment to the SE WWTF. A new conveyance system will also be installed to transport flow from the HW 47 facility to the SE WWTF. This conveyance system will transfer the wastewater from the northern portion of the City to the upgraded SE WWTF. The upgraded SE WWTF will treat all of the wastewater flow from the city of Troy. As a result of this project the City will only have one Outfall (#001) instead of the two they currently operate. The recommended SE WWTF upgrade incorporates a conventional activated sludge treatment system with tertiary filtration.

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.

**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.

SIGNATURE 		DATE 8-9-16	
NAME AND OFFICIAL TITLES / LICENSE # Jason Dennis, P.E. / 2010019526		COMPANY NAME Woodard & Curran, Inc.	
ADDRESS 1520 South Fifth Street, Suite 306		CITY St. Charles	STATE MO
TELEPHONE NUMBER WITH AREA CODE (800) 426-4242		ZIP CODE 63303	
		E-MAIL ADDRESS jdennis@woodardcurran.com	

**OWNER:** I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE 		DATE 8-9-16	
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**CONTINUING AUTHORITY:** I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE Same As Owner Above		DATE	
-------------------------------	--	------	--



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August 4, 2016

Missouri Department of Natural Resources  
Water Protection Program  
Attn: WPCB Engineering Section  
P.O. Box 176  
Jefferson City, MO 65102-0176

I am writing this letter in support of the City of Troy's project to decommission the Hwy 47 WWTF and expand the SE WWTF from a 1 MGD membrane plant to a 1.87 MGD Conventional Activated Sludge plant with Tertiary Filtration.

The citizens of the City of Troy showed their support for this project by voting their approval of an \$18.887M bond issue in the April municipal election with an overwhelming 76% majority.

The community understands the need to decommission the Hwy 47 WWTF because of it being outdated and inefficient and because it will eliminate the untreated overflows into the receiving stream.

Estimates show population growth doubling the size of Troy over the next 20 years. The newly designed and expanded plant will position the City to handle that growth. At the same time the new facility will be ready to adapt to anticipated new permit limits from the regulatory agencies, both federal and state.

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The City of Troy has begun to grow again after the recession. By increasing the overall capacity of the municipal sewer system it will allow the City to attract new business and industry as well as new residents. This will help to increase the MHI from the current \$49,510.00 which is already 5% over the state average. The new growth will also help attract jobs which would bring down the unemployment rate from the current 4.4%.

I am anxious to move forward with this project and I look forward to your favorable response.

Sincerely,



Mark A. Cross, Mayor  
City of Troy, Missouri  
800 Cap au Gris  
Troy, MO 63379  
636-528-4712

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## APPENDIX E. LAND APPLICATION EVALUATION



### 3.2.1 Non-Degrading Alternative #1 - Land Application with Seasonal Storage

The alternative of land application uses treated WWTF effluent to irrigate large tracts of land where crops are grown or to dispose of treated effluent by applying it to the surrounding land. In this scenario the existing outfall at the SE WWTF would still discharge up to its permitted amount of 1.0 MGD. After the proposed upgrade and combination of WWTF flows from the SE WWTF & HW 47 WWTF, flow in excess of 1.0 MGD would be stored and then applied to the land. This would require the construction of secondary effluent storage basins at the SE WWTF site. The storage basins would consist of earthen banks with rip-rap slopes and an interior liner system. The storage basins would require provisions for algae mitigation such as covers or other means. Additional storage basin capacity would also be required to hold treated effluent flow during conditions where land application could not occur such as when the ground is frozen. It is expected that effluent being applied to land would be required to go through disinfection year round. Therefore, the proposed UV disinfection system would be sized to handle all peak flows through the plant. This method is considered to be non-degrading because it would add no additional flow in excess of the current permitted flow of 1.0 MGD to the Cuivre River.

MDNR land application guidelines 10 CSR 20-8.020 Paragraph (15) (F), states the maximum application rate of typical domestic wastewater shall be 40-100 inches of applied wastewater per year depending on soil characteristics. The permeability of the soil in the area of Troy, MO was assumed to be moderate, 0.06-0.2 in/hr. According to 10 CSR 20-8.020 Paragraph (15) (F), soils with a permeability less than 0.2 in/hr shall not exceed an application rate of 40 in/yr. A limiting permeability of 0.06 in/hr is assumed for this analysis. Application of wastewater to land cannot occur when there is frost in the ground or when it is raining. This typically accounts for six months of the year in the Midwest, two – three months of frost with the remainder being rainy times. Thus for this alternative analysis it is assumed that land application will only occur for six months of the year. An average storage of 0.87 MGD over a six month (180 days) period is 156.6 million gallons of storage required.

A spray or center pivot irrigation system would be required to distribute the effluent over the land. If a single storage lagoon was to be created to store effluent with a ten-foot water depth and 100-foot buffer, approximately 56 acres of land would be required for the lagoon alone. The city could potentially find landowners in the area to accept their wastewater as irrigation water to their land. However, to insure that land is available the City would have to purchase land in addition to the land required for the lagoon. Upgrades to the SE WWTF would still be required to treat the influent. Irrigation/land application system components would also have to be purchased. These components include:

- 1 or 2 pump stations depending on where land could be purchased for the lagoon and liquid application.
- Flow diversion structure to take flows in excess of 1.0 MGD away from the outfall structure and the Cuivre River.
- Transmission mains to move water from the WWTF to the lagoon and ultimately to the land where it would be applied.
- An application system to spread water over the full area of land.

This alternative provides a different disposal method for the treated effluent water. All of the base project plant upgrades would still need to be completed. Land application is considered to be an impractical alternative due to the large amount of land required to be purchased, as well as the associated financial burden this would place on the City. In addition, the land required would generate much less revenue than if it was left available for development. For these reasons, Non-Degrading Alternative #1 is deemed impractical for upgrades to the SE WWTF.

### 3.2.2 Non-Degrading Alternative #2 - Subsurface Disposal with Seasonal Storage

Subsurface disposal is similar to land application, where treated effluent is used for irrigation of agricultural land or disposal below grade. The main difference is with subsurface disposal there must be a distribution system and disposal beds installed under the surface of the land. This would generally be done between 2 and 6 inches below the surface. Subsurface disposal allows for very little of the water applied to the land to be lost to evaporation. This method is also

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## APPENDIX E. LAND APPLICATION EVALUATION, CONTINUED



noted to reduce erosion from surface runoff. This alternative is non-degrading. It has been reported that subsurface systems used for irrigation generally use half as much water as surface watering systems because they transport water directly to the roots of the plants. In that case half the amount of land needed for Alternative #1 (Land Application with Seasonal Storage) would need to be purchased for this alternative. The storage needs for this alternative would be similar to that of Alternative #1 (Land Application with Seasonal Storage). However, the irrigation or disposal system would require the land to be completely dug up and reconstructed in order to install the subsurface distribution and disposal system. Subsurface disposal is also considered to be impractical because of the large amount of land which would be required to be purchased by the City. Also the land disturbance and reconstruction that the disposal system would require would result in an additional cost burden to the City. Additionally, labor and time would be required each year to perform maintenance on the distribution and disposal system which would increase operational and maintenance costs. For these reasons, Alternative #2 is considered impractical for upgrades to the SE WWTF.

### 3.2.3 Non-Degrading Alternative #3 - Recycling or Reuse

Typically, a recycling or reuse project that involves treated WWTF effluent goes to golf courses for irrigation, washing of trucks or groundwater recharge. The SE WWTF has a small non-potable water reuse system for in-plant uses only that is currently not operational. The average day excess flow (0.87 MGD) above the currently permitted flow of 1.0 MGD would never be fully used by the facility for non-potable uses. This would require another source of disposal/use. In addition, many of the potential reuse options could result in further degradation to the environment. Washing trucks for instance could lead to storm water being discharged to water bodies and potentially the Cuivre River. For these reasons recycling/reuse of treated effluent is considered to be impractical for upgrades to the SE WWTF.

### 3.2.4 Non-Degrading Alternative #4 - Diversion of Flow to a Regional WWTF

With the proposed combination of flows and decommissioning of the HW 47 WWTF, the SE WWTF will be acting as the regional WWTF for the City. There are no treatment facilities in the immediate area that could take and treat the additional flow from the City.

The Northwest Area Waste Water Treatment Facility (Northwest WWTF) in the City of Moscow Mills is located in close proximity to the SE WWTF site. The two facilities are located approximately 4,900 linear feet apart from each other. The Northwest WWTF is permitted for a flow of 99,999 gpd under Missouri State Operating Permit (MO-0119709). The current average day flow of the Northwest WWTF is approximately 40,000 gpd. This two cell lagoon facility does not have the capacity or treatment capabilities to accommodate 1.87 MGD of ADF from the City of Troy without a complete plant upgrade. An alternative connection to Moscow Mills was found to be cost prohibitive and not in alignment with the overall needs and goals of the City. Therefore, Alternative #4-Diversion of Flow to a Regional WWTF is considered to be impractical for upgrades to the SE WWTF.

In the future, the SE WWTF could provide a potential opportunity for the City of Moscow Mills to partner with the City of Troy for consolidation of treatment in the area of Lincoln county. The close proximity of the Northwest WWTF allows for a potential cost effective conversion to a pump station to transport flows to the City of Troy's SE WWTF site for treatment.

### 3.2.5 Non-Degrading Alternative #5 - Alternative Discharge Location

The SE WWTF discharges to the Cuivre River. The region around the City includes agricultural land, residential housing, development communities, and losing streams. The Cuivre River is the only river in the area with a significant flow which is maintained year round. The extreme length of pipe and energy requirements to pump effluent to a larger receiving stream such as the Mississippi River (14.2 miles) is cost prohibitive. Acquisitions of property easements and disturbance of the natural landscape would likely pose problems associated with the installation of an effluent transmission pipe line if moved to any other receiving water body. Any relocation of the discharge would still result in the base project being required to upgrade the SE WWTF to ensure compliance with current and future regulatory



**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
FACT SHEET  
FOR THE PURPOSE OF RENEWAL  
OF  
MO-0131296  
TROY SOUTHEAST WASTEWATER TREATMENT FACILITY**

Note: This permit was modified to reflect changes at the facility due to construction (Construction Permit CP0002008). Refer to the Fact Sheet Addendum for the Modification.

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant 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 stormwater 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)(A)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 (operating permit) listed below.

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

This Factsheet is for a Major facility.

## **Part I – Facility Information**

Facility Type: POTW - SIC #4952

Facility Description. Influent lift station / grit chamber / mechanical screening / Membrane Biological Reactor / equalization basin / aerobic sludge digestion / UV disinfection / cascade aeration channel / sludge holding tank / sludge is land applied

Design population equivalent is 10,000.

Design flow is 1.0 MGD. Actual flow is 239,000 gallons per day.

Design sludge production is 216 dry tons/year.

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

Application Date: 07/27/18

Expiration Date: 01/31/18

### **OUTFALL(S) TABLE:**

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
#001	1.55	Secondary	Domestic

### **Facility Performance History:**

This facility was last inspected on July 31, 2018. The inspection showed the following unsatisfactory feature: Failure to submit sludge reports in 2016 and 2017.

A review of Discharge Monitoring Reports shows exceedances for the following (month/year):

- CBOD<sub>5</sub>: 12/16, 12/17
- DO: 8/16
- *E. coli*: 9/17
- Ammonia: 3/14, 7/14, 3/16, 6/16, 12/17, 1/18
- TSS: 6/16

### **Comments:**

Changes in this permit include the addition of the following: influent, effluent, and instream monitoring for nutrients, quarterly Copper monitoring, quarterly downstream monitoring for Total Hardness, a Chronic WET test once per permit cycle, and the development of

a Stormwater Pollution Prevention Plan (SWPPP). See Part VI of the Fact Sheet for further information regarding the addition and removal of effluent parameters. Special conditions were updated to include the addition of inflow and infiltration reporting requirements, reporting of Non-detects, bypass reporting requirements, and SWPPP requirements.

## **Part II – Operator Certification Requirements**

☒ - This facility is required to have a certified operator.

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], the permittee shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.020(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems, if applicable, as listed below:

Owned or operated by or for a

☒ - Municipalities

☐ - Federal agency

☐ - County

☐ - Public Sewer District

☐ - State agency

☐ - Private Sewer Company regulated by the Public Service Commission

☐ - Public Water Supply Districts

Each of the above entities are only applicable if they have a Population Equivalent greater than two hundred (200).

This facility currently requires an operator with a C Certification Level. Please see **Appendix - Classification Worksheet**. Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator's Name: Michael Rosen

Certification Number: 12193

Certification Level: A

The listing of the operator above only signifies that staff drafting this operating permit have reviewed appropriate Department records and determined that the name listed on the operating permit application has the correct and applicable Certification Level.

## **Part III– Operational Control Testing Requirements**

Missouri Clean Water Commission regulation 10 CSR 20-9.010 requires certain publically owned treatment works and privately owned facilities regulated by the Public Service Commission to conduct internal operational control monitoring to further ensure proper operation of the facility and to be a safeguard or early warning for potential plant upsets that could affect effluent quality. This requirement is only applicable if the publically owned treatment works and privately owned facilities regulated by the Public Service Commission has a Population Equivalent greater than two hundred (200).

10 CSR 20-9.010(3) allows the Department to modify the monitoring frequency required in the rule based upon the Department's judgement of monitoring needs for process control at the specified facility

☒ - As per [10 CSR 20-9.010(4)], the facility is required to conduct operational monitoring. The facility is a mechanical plant and is required to conduct operational control monitoring as follows:

Operational Monitoring Parameter	Frequency
Precipitation	Daily (M-F)
Flow – Influent or Effluent	Daily (M-F)
pH – Influent	Daily (M-F)
Temperature (Aeration basin)	Daily (M-F)
TSS – Influent	Weekly
TSS – Mixed Liquor	Weekly
Settleability – Mixed Liquor	Daily (M-F)
Dissolved Oxygen – Mixed Liquor	Daily (M-F)
Dissolved Oxygen – Aerobic Digester	Daily (M-F)

**Part IV – Receiving Stream Information****RECEIVING STREAM(S) TABLE: OUTFALL #001**

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Cuivre River	P	152	AQL, HHP, IRR, LWV, SCR, WBC-A	07110008-0403	Direct Discharge

\*As per 10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1<sup>st</sup> classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses which may be found in the receiving streams table, above:

10 CSR 20-7.031(1)(C)1.:

**AQL** = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: **WWH** = Warm Water Habitat; **CDF** = Cold-water fishery (Current narrative use is cold-water habitat.); **CLF** = Cool-water fishery (Current narrative use is cool-water habitat); **EAH** = Ephemeral Aquatic Habitat; **MAH** = Modified Aquatic Habitat; **LAH** = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)

10 CSR 20-7.031(1)(C)2.: Recreation in and on the water

**WBC** = Whole Body Contact recreation where the entire body is capable of being submerged;

**WBC-A** = Whole body contact recreation that supports swimming uses and has public access;

**WBC-B** = Whole body contact recreation that supports swimming;

**SCR** = Secondary Contact Recreation (like fishing, wading, and boating).

10 CSR 20-7.031(1)(C)3. to 7.:

**HHP** (formerly HHF) = Human Health Protection as it relates to the consumption of fish;

**IRR** = Irrigation for use on crops utilized for human or livestock consumption;

**LWW** = Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection);

**DWS** = Drinking Water Supply;

**IND** = Industrial water supply

10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)

**WSA** = Storm- and flood-water storage and attenuation; **WHP** = Habitat for resident and migratory wildlife species;

**WRC** = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; **WHC** = Hydrologic cycle maintenance.

10 CSR 20-7.031(6): **GRW** = Groundwater

**RECEIVING STREAM(S) LOW-FLOW VALUES:**

RECEIVING STREAM	LOW-FLOW VALUES (CFS)*		
	1Q10	7Q10	30Q10
Cuivre River	1.13	1.42	2.11

\* - Data from USGS Gauge Station 05514500 located on the Cuivre River near Troy, MO.

**MIXING CONSIDERATIONS TABLE:**

MIXING ZONE (CFS) [10 CSR 20-7.031(5)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(5)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
0.283	0.355	0.528	0.0283	0.0355	0.0528

**RECEIVING STREAM MONITORING REQUIREMENTS:**

**Permitted Feature SM1.** Facilities with a design flow greater than or equal to one million gallons per day are required to sample their effluent monthly for Total Phosphorus and Total Kjeldahl Nitrogen, Nitrite + Nitrate and ammonia per 10 CSR 20-7.015(9)(D)8.B. Upstream monitoring for these parameters is necessary to determine background concentrations in order to complete calculations related to determine nutrient loading to the receiving stream.

**Permitted Feature SM2.** Downstream sampling for Total Hardness is included as the permit includes metals that the toxicity of the metals are hardness dependent.

Receiving Water Body's Water Quality

Currently, no stream survey has been conducted by the Department. When a stream survey is conducted, more information may be available about the receiving stream.



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

### **ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:**

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

☒ - The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(40)] & [10 CSR 20-7.031(1)(O)], or is an existing facility.

### **ANTI-BACKSLIDING:**

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(o); 40 CFR Part 122.44(l)] 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 Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.

☒ - Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.

- **Ammonia as N.** Effluent limitations were re-calculated for Ammonia based on new information derived from discharge monitoring reports and on the current Missouri Water Quality Standards for Ammonia. The newly established limitations are still protective of water quality.
- **Dissolved Oxygen.** The previous permit contained final effluent limits of 5.0 mg/L as a daily minimum and monthly average minimum to ensure the maintenance of water quality in the receiving stream. The permit writer conducted a Reasonable Potential Determination for both specific and general criteria related to DO by reviewing DMR data and applicable general criteria. As a result, the permit writer has made a determination that the discharge does not have the reasonable potential to cause or contribute to an excursion of the standard and has removed the final effluent limits for DO from this permit. The permit is still protective of water quality and this determination will be reassessed at the time of renewal.
- **pH.** The previous permit contained final effluent limits of 6.5-9.0 SU. However, the permit writer has determined that final effluent limits of 6.0-9.0 SU are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.
- **Sampling and Reporting Frequencies.** The following sampling and reporting frequencies changes were made due to consistency amongst effluent data and compliance with effluent limits: flow was reduced from once per day to once per weekday and Oil & Grease was reduced from once per week to once per month.

☒ - The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).

- **General Criteria.** The previous permit contained a special condition which described a specific set of prohibitions related to general criteria found in 10 CSR 20-7.031(4). In order to comply with 40 CFR 122.44(d)(1), the permit writer has conducted reasonable potential determinations for each general criterion and established numeric effluent limitations where reasonable potential exists. While the removal of the previous permit special condition creates the appearance of backsliding, since this permit establishes numeric limitations where reasonable potential to cause or contribute to an excursion of the general criteria exists the permit maintains sufficient effluent limitations and monitoring requirements in order to protect water quality, this permit is equally protective as compared to the previous permit. Therefore, given this new information, and the fact that the previous permit special condition was not consistent with 40 CFR 122.44(d)(1), an error occurred in the establishment of the general criteria as a special condition of the previous permit. Please see Part VI – Effluent Limits Determination for more information regarding the reasonable potential determinations for each general criterion related to this facility.

**ANTIDEGRADATION:**

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)], for domestic wastewater discharge with new, altered, or expanding discharges, the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. In accordance with Missouri's water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See <https://dnr.mo.gov/document-search/antidegradation-implementation-procedure>.

☒ - No degradation proposed and no further review necessary. Facility did not apply for authorization to increase pollutant loading or to add additional pollutants to their discharge.

For stormwater discharges, the stormwater BMP chosen for the facility, through the antidegradation analysis performed by the facility, must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

☒ - The facility must review and maintain stormwater BMPs as appropriate.

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

As per [10 CSR 20-6.010(2)(C)], ...An applicant may utilize a lower preference continuing authority by submitting, as part of the application, when a higher level authority is available, must submit information to the department for review and approval, provided it does not conflict with any area-wide management plan approved under section 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 (i.e. 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.

☒ - Permittee is authorized to land apply biosolids in accordance with Standard Conditions III.

**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.

☒ - The facility is not currently under Water Protection Program enforcement action.

**ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:**

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. This final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online. In an effort to aid facilities in the reporting of applicable information electronically, the Department has created several new forms including operational control monitoring forms and an I&I location and reduction form. These forms are for optional use and can be found on the Department's website at the following locations:

Operational Monitoring Report – Lagoon MO 780-2801: <https://dnr.mo.gov/document-search/operational-monitoring-report-lagoon-mo-780-2801>

Operational Monitoring Report – Mechanical/ Recirculating Filter Media Bed Wastewater Facility MO 780-2800: <https://dnr.mo.gov/document-search/operational-monitoring-report-mechanical-recirculating-filter-media-bed-wastewater-facility-mo-780-2800>

I&I Report: <https://dnr.mo.gov/document-search/annual-inflow-infiltration-report-mo-780-2690>

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a permittee must first submit an eDMR Waiver Request Form: <https://dnr.mo.gov/document-search/electronic-discharge-monitoring-report-waiver-request-form-mo-780-2692>. A request must be made for each facility. If more than one facility is owned or operated by a single entity, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is non-transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

☒ - The permittee/facility is currently using the eDMR data reporting system.

#### **NUMERIC LAKE NUTRIENT CRITERIA**

☒ - This facility does not discharge into a lake watershed where numeric lake nutrient criteria are applicable.

#### **PRETREATMENT PROGRAM:**

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Several special conditions pertaining to the permittee's pretreatment program may be included in the permit, and are as follows:

- Implementation and enforcement of the program,
- Annual pretreatment report submittal,
- Submittal of list of industrial users,
- Technical evaluation of need to establish local limitations, and
- Submittal of the results of the evaluation

☒ - The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

#### **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)(1)(iii)] if the permit writer determines that any given 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.

☒ - An RPA was conducted on appropriate parameters. Please see **APPENDIX – 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.

☒ - Secondary Treatment is 85% removal [40 CFR Part 133.102(a)(3) & (b)(3)].

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

Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(12)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1.(13) mandates that the Department issue permits for discharges of water contaminants into the waters of this state, and also for the operation of sewer systems. Such permit conditions shall ensure compliance with all requirements as established by sections 644.006 to 644.141. Standard Conditions Part I, referenced in the permit, contains provisions requiring proper operation and maintenance of all facilities and systems of treatment and control. Missouri RSMo §644.026.1.(15) instructs the Department to require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities. To ensure that public health and the environment are protected, any noncompliance which may endanger public health or the environment must be reported to the Department within 24 hours of the time the permittee becomes aware of the noncompliance. Standard Conditions Part I, referenced in the permit, contains the reporting requirements for the permittee when bypasses and upsets occur. The permit also contains requirements for permittees to develop and implement a program for maintenance and repair of the collection system. The permit requires that the permittee submit an annual report to the Department for the previous calendar year that contains a summary of efforts taken by the permittee to locate and eliminate sources of excess I & I, a summary of general maintenance and repairs to the collection system, and a summary of any planned maintenance and repairs to the collection system for the upcoming calendar year.

☒ - At this time, the Department recommends the US EPA's Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (Document # EPA 305-B-05-002) or the Departments' CMOM Model located at <https://dnr.mo.gov/document-search/capacity-management-operations-maintenance-plan-editable-template>. For additional information regarding the Departments' CMOM Model, see the CMOM Plan Model Guidance document at <https://dnr.mo.gov/document-search/capacity-management-operations-maintenance-plan-model-guidance-pub2574/pub2574>. The CMOM identifies some of the criteria used to evaluate a collection system's management, operation, and maintenance and was intended for use by the EPA, state, regulated community, and/or third party entities. The CMOM is applicable to small, medium, and large systems; both public and privately owned; and both regional and satellite collection systems. The CMOM does not substitute for the Clean Water Act, the Missouri Clean Water Law, and both federal and state regulations, as it is not a regulation.

#### **SCHEDULE OF COMPLIANCE (SOC):**

Per 644.051.4 RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement, or if prohibited by other statute or regulation. A SOC includes 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. *See also* Section 502(17) of the Clean Water Act, and 40 CFR §122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR § 122.47(a)(1), 10 CSR 20-7.031(11), and 10 CSR 20-7.015(9), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, a SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.

A SOC is not allowed:

- For effluent limitations based on technology-based standards established in accordance with federal requirements, if the deadline for compliance established in federal regulations has passed. 40 CFR § 125.3.
- For a newly constructed facility in most cases. Newly constructed facilities must meet applicable effluent limitations when discharge begins, because the facility has installed the appropriate control technology as specified in a permit or antidegradation review. A SOC is allowed for a new water quality based effluent limit that was not included in a previously public noticed permit or antidegradation review, which may occur if a regulation changes during construction.
- To develop a TMDL, UAA, or other study that may result in site-specific criteria or alternative effluent limits. A facility is not prohibited from conducting these activities, but a SOC may not be granted for conducting these activities.

In order to provide guidance to Permit Writers in developing SOC's, and attain a greater level of consistency, on April 9, 2015 the Department issued an updated policy on development of SOC's. This policy provides guidance to Permit Writers on the standard time frames for schedules for common activities, and guidance on factors that may modify the length of the schedule such as a Cost Analysis for Compliance.

#### **SEWER EXTENSION AUTHORITY SUPERVISED PROGRAM:**

In accordance with [10 CSR 20-6.010(6)(A)], the Department may grant approval of a permittee's Sewer Extension Authority Supervised Program. These approved permittees regulate and approve construction of sanitary sewers and pump stations, which are tributary to this wastewater treatment facility. The permittee shall act as the continuing authority for the operation, maintenance, and modernization of the constructed collection system. See Sewer Extension tab on <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/wastewater/construction-engineering>.

☒ - The permittee does not have a Department approved Sewer Extension Authority Supervised Program.

### **STORMWATER POLLUTION PREVENTION PLAN (SWPPP):**

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of stormwater discharges. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. For further guidance, consult the antidegradation implementation procedure (<https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/wastewater/construction-engineering>).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs that are reasonable and cost effective. The AA evaluation should include practices that are designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure (AIP)*, Section II.B.

If parameter-specific numeric exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the Department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification; the application is found at:

<https://dnr.mo.gov/document-search/form-b2-application-operating-permit-facilities-receive-primarily-domestic-waste-have-design-flow-more-100000-gallons-day-mo-780-1805>.

☒ - 10 CSR 20-6.200 and 40 CFR 122.26 includes treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that is located within the confines of the facility, with a design flow of 1.0

MGD or more, or are required to have an approved pretreatment program under 40 CFR part 403, as an industrial activity in which permit coverage is required. See Page #9 for information regarding a “No Exposure” exclusion.

In lieu of requiring sampling in the site-specific permit, the facility is required to develop and implement a Stormwater Pollution Prevention Plan (SWPPP). A facility can apply for conditional exclusion for “no exposure” of industrial activities and materials to stormwater by submitting a permit modification via Form B2 (<https://dnr.mo.gov/document-search/form-b2-application-operating-permit-facilities-receive-primarily-domestic-waste-have-design-flow-more-100000-gallons-day-mo-780-1805>) appropriate application filing fees and a completed No Exposure Certification for Exclusion from NPDES Stormwater Permitting under Missouri Clean Water Law (<https://dnr.mo.gov/document-search/no-exposure-certification-exclusion-npdes-stormwater-permitting-under-missouri-clean-water-law-mo-780-2828>) to the Department’s Water Protection Program, Operating Permits Section. Upon approval of the No Exposure Certification, the permit will be modified and the Special Condition to develop and implement a SWPPP will be removed. This information will be reevaluated at the time of renewal.

#### **VARIANCE:**

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

☒ - This operating permit is not drafted under premises of a petition for variance.

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

As per [10 CSR 20-2.010(86)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

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

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

Where C = downstream concentration      C<sub>e</sub> = effluent concentration  
Cs = upstream concentration              Q<sub>e</sub> = effluent flow  
Q<sub>s</sub> = upstream 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” (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 be, 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.

#### **WLA MODELING:**

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

☒ - A WLA study was either not submitted or determined not applicable by Department staff.



**WATER QUALITY STANDARDS:**

Per [10 CSR 20-7.031(4)], 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 to include 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.

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A) and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(J)2.A & B are being met. Under [10 CSR 20-6.010(8)(B)], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by facilities meeting the following criteria:

- ☒ Facility is a designated Major.
- ☐ Facility continuously or routinely exceeds its design flow.
- ☐ Facility that exceeds its design population equivalent (PE) for BOD<sub>5</sub> whether or not its design flow is being exceeded.
- ☐ Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- ☐ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- ☐ Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH<sub>3</sub>)
- ☐ Facility is a municipality with a Design Flow  $\geq$  22,500 gpd.
- ☐ Other – please justify.

☒ - The permittee is 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 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 20-7.015(9)(G) states a bypass means the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending, 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.

☒ - This facility does not anticipate bypassing.

**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 absorb 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 the TMDL calculation

☒ - This facility does not discharge to a 303(d) listed stream.



## Part VI – Effluent Limits Determination

### 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 below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- |   |   |
|---|---|
| <input type="checkbox"/> Missouri or Mississippi River [10 CSR 20-7.015(2)]     | <input type="checkbox"/> Special Streams [10 CSR 20-7.015(6)]             |
| <input type="checkbox"/> Lakes or Reservoirs [10 CSR 20-7.015(3)]               | <input type="checkbox"/> Subsurface Waters [10 CSR 20-7.015(7)]           |
| <input type="checkbox"/> Losing Streams [10 CSR 20-7.015(4)]                    | <input checked="" type="checkbox"/> All Other Waters [10 CSR 20-7.015(8)] |
| <input type="checkbox"/> Metropolitan No-Discharge Streams [10 CSR 20-7.015(5)] |   |

### 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	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Flow	MGD	1	*		*	*/*	1/weekday	monthly	T
CBOD <sub>5</sub>	mg/L	1		15	10	15/10	1/week	monthly	C
TSS	mg/L	1		20	15	20/15	1/week	monthly	C
<i>Escherichia coli</i> **	#/100mL	1, 3		630	126	630/126	1/week	monthly	G
Ammonia as N (Apr 1 – Sep 30)	mg/L	2, 3	8.0		1.5	7.9/1.8	1/week	monthly	C
Ammonia as N (Oct 1 – Mar 31)	mg/L	2, 3	12.3		2.4	12.3/2.7	1/week	monthly	C
Oil & Grease	mg/L	1, 3	15		10	15/10	1/month	monthly	G
Total Phosphorus	mg/L	1, 11	*		*	***	1/month	monthly	C
Total Kjeldahl Nitrogen	mg/L	1, 11	*		*	***	1/month	monthly	C
Nitrites+Nitrates	mg/L	1, 11	*		*	***	1/month	monthly	C
Copper, Total Recoverable	µg/L	3	*		*	***	1/quarter	quarterly	C
Acute Whole Effluent Toxicity	TUa	1, 9	*			Pass/Fail	1/year	annually	C
Chronic Whole Effluent Toxicity	TUc	1, 9	*			***	1/permit cycle	1/permit cycle	C
PARAMETER	Unit	Basis for Limits	Minimum		Maximum	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
pH	SU	1	6.0		9.0	6.5-9.0	1/week	monthly	G
PARAMETER	Unit	Basis for Limits	Daily Minimum		Monthly Avg Min	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
CBOD <sub>5</sub> Percent Removal	%	1			85	85	1/quarter	quarterly	M
TSS Percent Removal	%	1			85	85	1/quarter	quarterly	M

\* - Monitoring requirement only.

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

\*\*\* - Parameter not previously established in previous state operating permit.

\*\*\*\* - C = 24-hour composite

G = Grab

T = 24-hr. total

M = Measured/calculated

#### Basis for Limitations Codes:

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

### 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.

- **Carbonaceous Biochemical Oxygen Demand (BOD<sub>5</sub>)**. Operating permit retains 15 mg/L as a Weekly Average and 10 mg/L as a Monthly Average from the previous permit. The effluent limits were developed in the 2004 Water Quality Review using a Streeter-Phelps water quality model.
- **Total Suspended Solids (TSS)**. Operating permit retains 20 mg/L as a Weekly Average and 15 mg/L as a Monthly Average from the previous permit. The effluent limits were developed in the 2004 Water Quality Review using a Streeter-Phelps water quality model.
- ***Escherichia coli* (E. coli)**. Monthly average of 126 per 100 mL as a geometric mean and Weekly Average of 630 per 100 mL as a geometric mean during the recreational season (April 1 – October 31), for discharges within two miles upstream of segments or lakes Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.015(9)(B). An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d). The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 6, 10, and 5 (#/100mL). Geometric Mean = 5<sup>th</sup> root of (1)(4)(6)(10)(5) = 5<sup>th</sup> root of 1,200 = 4.1 #/100mL.
- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L. No 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:  $C_e = ((1.55 + 0.528)1.5 - (0.528 * 0.01))/1.55$   
 $C_e = 2.01 \text{ mg/L}$

Acute WLA:  $C_e = ((1.55 + 0.0283)12.1 - (0.0283 * 0.01))/1.55$   
 $C_e = 12.32 \text{ mg/L}$

$LTA_c = 2.01 \text{ mg/L} (0.430) = 0.86 \text{ mg/L}$  [CV = 2.26, 99<sup>th</sup> Percentile, 30 day avg.]  
 $LTA_a = 12.32 \text{ mg/L} (0.108) = 1.33 \text{ mg/L}$  [CV = 2.26, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

MDL = 0.86 mg/L (9.25) = **8.0 mg/L** [CV = 2.26, 99<sup>th</sup> Percentile]  
 AML = 0.86 mg/L (1.78) = **1.5 mg/L** [CV = 2.26, 95<sup>th</sup> Percentile, n =30]

Winter: October 1 – March 31

Chronic WLA:  $C_e = ((1.55 + 0.528)3.1 - (0.528 * 0.01))/1.55$   
 $C_e = 4.15 \text{ mg/L}$

Acute WLA:  $C_e = ((1.55 + 0.0283)12.1 - (0.0283 * 0.01))/1.55$   
 $C_e = 12.32 \text{ mg/L}$

$LTA_c = 4.15 \text{ mg/L} (0.448) = 1.86 \text{ mg/L}$  [CV = 2.13, 99<sup>th</sup> Percentile, 30 day avg.]  
 $LTA_a = 12.32 \text{ mg/L} (0.112) = 1.38 \text{ mg/L}$  [CV = 2.13, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

MDL = 1.38 mg/L (8.91) = **12.3 mg/L** [CV = 2.13, 99<sup>th</sup> Percentile]  
 AML = 1.38 mg/L (1.73) = **2.4 mg/L** [CV = 2.13, 95<sup>th</sup> Percentile, n =30]

- **Oil & Grease**. Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **Total Phosphorus and Total Nitrogen (Speciated)**. Effluent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate required per 10 CSR 20-7.015(9)(D)8.
- **pH**. 6.0-9.0 SU. pH limitations [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the assimilative capacity of the receiving stream.

- **Carbonaceous Biochemical Oxygen Demand (BOD<sub>5</sub>) Percent Removal.** In accordance with 40 CFR Part 133, 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. This facility is required to meet 85% removal efficiency for BOD<sub>5</sub>.
- **Total Suspended Solids (TSS) Percent Removal.** In accordance with 40 CFR Part 133, 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. This facility is required to meet 85% removal efficiency for TSS.
- **Copper, Total Recoverable.** Monitoring requirement only. As required by the application for renewal, the facility submitted sample results for the Expanded Effluent Test (EET), which included one sample for Copper. The reported values for this parameter was 65 µg/L as a Daily Maximum and a Daily Average. Using the 7Q10 low flow of 1.42 cfs as well as a hardness of 290 (as reported on the EET), the criteria for Total Recoverable Copper is as follows: acute – 38.16, chronic – 23.17. As a result, additional monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards for Cyanide. The permit is protective of water quality and this determination will be reassessed at the time of renewal.

#### **Whole Effluent Toxicity**

- **Acute Whole Effluent Toxicity.** Monitoring requirement only.

Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

$$\text{Acute AEC\%} = \{[(1.55 + 0.037) / 1.55]^{-1}\} \times 100 = \mathbf{98\%}$$

- **Chronic Whole Effluent Toxicity.** Monitoring requirement only.

Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

$$\text{Chronic AEC\%} = \{[(1.55 + 0.37) / 1.55]^{-1}\} \times 100 = \mathbf{80\%}$$

#### **Parameters Removed.**

- **Dissolved Oxygen.** The previous permit contained final effluent limits of 5.0 mg/L as a daily minimum and monthly average minimum to ensure the maintenance of water quality in the receiving stream. The permit writer conducted a Reasonable Potential Determination for both specific and general criteria related to DO by reviewing DMR data and applicable general criteria. As a result, the permit writer has made a determination that the discharge does not have the reasonable potential to cause or contribute to an excursion of the standard and has removed the final effluent limits for DO from this permit. The permit is still protective of water quality and this determination will be reassessed at the time of renewal.

#### **Sampling Frequency Justification:**

Sampling and Reporting Frequency was retained from previous permit with the following exceptions: Flow reduced to weekdays and Oil & Grease reduced to monthly. Weekly sampling is required for *E. coli*, per 10 CSR 20-7.015(9)(D)6.A.

**WET Test Sampling Frequency Justification.** WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.

#### **Acute Whole Effluent Toxicity**

- ☒ - No less than **ONCE/YEAR:** Facility is designated as a Major facility or has a design flow  $\geq$  1.0 MGD.

#### **Chronic Whole Effluent Toxicity**

- ☒ -No less than **ONCE/PERMIT CYCLE:** POTW facilities with a design flow of greater than 1.0 million gallons per day, but less than 10 million gallons per day, shall conduct and submit to the Department a chronic WET test no less than once per five years. These minimum testing frequencies may be increased based on toxic parameters present in a facility's in the effluent, demonstrated toxicity in previous WET tests, or based on impacts to the receiving stream

#### **Sampling Type Justification:**

As per 10 CSR 20-7.015, samples collected for mechanical plants shall be a 24 hour composite sample. Grab samples, however, must be collected for pH, *E. coli*, and Oil & Grease in accordance with recommended analytical methods. For further information on sampling and testing methods please review 10 CSR 20-7.015(9)(D) 2.

### **PERMITTED FEATURE INF – INFLUENT MONITORING**

The monitoring requirements established in the below Monitoring Requirements 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 the monitoring requirements listed in this table.

#### **INFLUENT MONITORING TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
BOD <sub>5</sub>	mg/L	1	*		*	***	1/quarter	quarterly	C
TSS	mg/L	1	*		*	***	1/quarter	quarterly	C
Ammonia as N	mg/L	1	*		*	***	1/month	monthly	C
Total Phosphorus	mg/L	1	*		*	***	1/month	monthly	C
Total Kjeldahl Nitrogen	mg/L	1	*		*	***	1/month	monthly	C
Nitrite + Nitrates	mg/L	1	*		*	***	1/month	monthly	C

\* - Monitoring requirement only.

\*\*\*\* - C = 24 hr. Composite

\*\*\* - Parameter not previously established in previous state operating permit.

#### **Basis for Limitations Codes:**

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

### **Permitted Feature INF – DERIVATION AND DISCUSSION OF MONITORING REQUIREMENTS:**

- **BOD<sub>5</sub> and TSS.** Influent monitoring for Biochemical Oxygen Demand<sub>5</sub> and Total Suspended Solids is required to determine removal efficiency, which is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment in 40 CFR 133.102.
- **Total Phosphorus and Total Nitrogen (Speciated)** Influent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, nitrite + nitrate, and ammonia required per 10 CSR 20-7.015(9)(D)8.

#### **Sampling Frequency Justification:**

Influent monitoring frequencies established per 10 CSR 20-7.015(9)(D)8 for nutrients. The sampling and reporting frequency for influent BOD<sub>5</sub> and TSS has been established to match the required sampling frequency of these parameters in the effluent.

#### **Sampling Type Justification**

Sample types for influent parameters align with effluent parameters. Samples should be analyzed as soon as possible after collection and/or properly preserved according to method requirements.

### **PERMITTED FEATURE SM1 – INSTREAM MONITORING (UPSTREAM)**

The monitoring requirements established in the below Monitoring Requirements 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 the monitoring requirements listed in this table..

#### **INSTREAM MONITORING REQUIREMENTS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Total Phosphorus	mg/L	7	*		*	***	1/month	monthly	G
Total Kjeldahl Nitrogen	mg/L	7	*		*	***	1/month	monthly	G
Nitrate + Nitrite	mg/L	7	*		*	***	1/month	monthly	G
Ammonia	mg/L	7	*		*	***	1/month	monthly	G

\* - Monitoring requirement only.

\*\*\*\* - C = 24-hour composite

\*\*\* - Parameter not previously established in previous state operating permit.

G = Grab

#### **Basis for Limitations Codes:**

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

**PERMITTED FEATURE SM1 – DERIVATION AND DISCUSSION OF MONITORING REQUIREMENTS:**

- **Total Phosphorus, Total Kjeldahl Nitrogen, Ammonia, and Nitrate + Nitrite.** Facilities with a design flow greater than 1 million gallons per day are required to sample their effluent monthly for Total Phosphorus, Total Kjeldahl Nitrogen, Ammonia, and Nitrate + Nitrite per 10 CSR 20-7.015(9)(D)8. Upstream monitoring for these parameters is necessary to determine background stream concentrations in order to complete calculations that determine instream nutrient loading.

**Sampling Frequency Justification:**

The sampling and reporting frequency for Total Phosphorus, Total Kjeldahl Nitrogen, Ammonia, and Nitrate + Nitrite has been established to match the required sampling frequency of these parameters in the effluent.

**Sampling Type Justification**

Sample types for Total Phosphorus, Total Kjeldahl Nitrogen, Ammonia, and Nitrate + Nitrite align with those same effluent parameters. Samples should be analyzed as soon as possible after collection and/or properly preserved according to method requirements.

**PERMITTED FEATURE SM2 – INSTREAM MONITORING (DOWNSTREAM)**

The monitoring requirements established in the below Monitoring Requirements 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 the monitoring requirements listed in this table.

**MONITORING REQUIREMENTS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Total Hardness	mg/L	1, 3	*		*	***	1/quarter	quarterly	G

\* - Monitoring requirement only.

\*\*\* - Parameter not previously established in previous state operating permit.

\*\*\*\* - C = 24-hour composite

G = Grab

**Basis for Limitations Codes:**

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

**PERMITTED FEATURE SM2 – DERIVATION AND DISCUSSION OF MONITORING REQUIREMENTS:**

- **Total Hardness.** Monitoring only requirement as the metals parameters contained in the permit are hardness based. This data will be used in the next permit renewal.

**Sampling Frequency Justification:**

The sampling and reporting frequency for Total Hardness has been established to match the required sampling frequency of the metals parameters in the effluent.

**Sampling Type Justification:**

For the purposes of instream data collection, and as the upstream water quality should be consistent over a 24 hour period, grab samples are sufficient. Samples should be analyzed as soon as possible after collection and/or properly preserved according to method requirements.

### **OUTFALL #001 – GENERAL CRITERIA CONSIDERATIONS:**

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into the permit for those pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states that pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. In order to comply with this regulation, the permit writer will complete reasonable potential determinations on whether the discharge will violate any of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion (the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)). It should also be noted that Section 644.076.1, RSMo as well as Section D – Administrative Requirements of Standard Conditions Part I of this permit states that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule or regulation promulgated by the commission.

- (A) 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. The discharge from this facility is made up of treated domestic wastewater. Based upon review of the recent Report of Compliance Inspection for the inspection conducted on July 31, 2018, no evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, this facility utilizes secondary treatment technology and is currently in compliance with effluent limitations that are more stringent than the secondary treatment technology based effluent limits established in 40 CFR 133 and there has been no indication to the Department that the stream has had issues maintaining beneficial uses as a result of this discharge. Based on the information reviewed during the drafting of this permit, these final effluent limitations appear to have protected against the excursion of this criterion in the past. Therefore, the discharge does not have the reasonable potential to cause or contribute to an excursion of this criterion.
- (B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.
- (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life. This permit contains final effluent limitations which are protective of both acute and chronic toxicity for various pollutants that are either expected to be discharged by domestic wastewater facilities or that were disclosed by this facility on the application for permit coverage. Based on the information reviewed during the drafting of this permit, it has been determined if the facility meets final effluent limitations established in this permit, there is no reasonable potential for the discharge to cause an excursion of this criterion.
- (E) There shall be no significant human health hazard from incidental contact with the water. Please see (D) above as justification is the same.
- (F) There shall be no acute toxicity to livestock or wildlife watering. Please see (D) above as justification is the same.
- (G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community. Please see (A) above as justification is the same.
- (H) 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. The discharge from this facility is made up of treated domestic wastewater. No evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, any solid wastes received or produced at this facility are wholly contained in appropriate storage facilities, are not discharged, and are disposed of offsite. This discharge is subject to Standard Conditions Part III, which contains requirements for the management and disposal of sludge to prevent its discharge. Therefore, this discharge does not have reasonable potential to cause or contribute to an excursion of this criterion.

### **Part VII – Cost Analysis for Compliance**

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a “finding of affordability” on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

☒ - The Department is required to determine “findings of affordability” because the permit applies to a combined or separate sanitary sewer system for a publically-owned treatment works.

**Cost Analysis for Compliance** - The Department has made a reasonable search for empirical data indicating the permit is affordable. The search consisted of a review of Department records that might contain economic data on the community, a review of information provided by the applicant as part of the application, and public comments received in response to public notices of this draft permit. If the empirical cost data was used by the permit writer, this data may consist of median household income, any other ongoing projects that the Department has knowledge, and other demographic financial information that the community provided as contemplated by Section 644. 145.3.

The following table summarizes the results of the cost analysis. See **Appendix – Cost Analysis for Compliance** for detailed information.

**Summary Table. Cost Analysis for Compliance Summary for the City of Troy**

New Permit Requirements			
<u>Troy Highway 47 WWTF</u>			
Outfall #003:	Monthly monitoring (influent and effluent*) Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrites + Nitrates; monthly monitoring (influent) for Ammonia as N; final effluent limits for Total Recoverable Cadmium, Lead, Selenium, and Thallium * - increased from quarterly		
<u>Troy Southeast WWTF</u>			
Outfall #001:	Monthly monitoring (influent and effluent) Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrites + Nitrates; monthly monitoring (influent) for Ammonia as N; Quarterly monitoring for Total Recoverable Copper; Chronic WET test once per permit cycle		
SM1 (Upstream):	Monthly monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrites + Nitrates, and Ammonia as N		
SM2 (Downstream):	Quarterly monitoring for Total Hardness		
Other:	The development of a Stormwater Pollution Prevention Plan (SWPPP)		
Estimated Annual Cost	Annual Median Household Income (MHI)	Estimated Monthly User Rate	User Rate as a Percent of MHI
\$8,770	\$52,526	\$39.41	0.90%



## **Part VIII – 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.

### **WATER QUALITY STANDARD REVISION:**

In accordance with section 644.058, RSMo, the Department is required to utilize an evaluation of the environmental and economic impacts of modifications to water quality standards of twenty-five percent or more when making individual site-specific permit decisions.

☒ - This operating permit does not contain requirements for a water quality standard that has changed twenty-five percent or more since the previous operating permit.

### **PERMIT SYNCHRONIZATION:**

The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the Department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than 4 years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit. With permit synchronization, this permit will expire in the 1<sup>st</sup> Quarter of calendar year 2024.

### **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 was from April 26, 2019 to May 27, 2019. No comments received.

**DATE OF FACT SHEET:** FEBRUARY 28, 2019

### **COMPLETED BY:**

**ASHLEY KEELY, ENVIRONMENTAL SPECIALIST  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT  
(573) 751-7326  
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## Appendices

### APPENDIX – RPA RESULTS:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Total Ammonia as Nitrogen (Summer) mg/L	12.1	90.34	1.5	68.63	65	31/0.005	2.26	2.97	YES
Total Ammonia as Nitrogen (Winter) mg/L	12.1	42.25	3.1	32.10	61	14/0.001	2.13	3.07	YES

N/A – Not Applicable

\* - Units are (µg/L) unless otherwise noted.

\*\* - If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent. If the number of samples is < 10, then the default CV value must be used in the WQBEL for the applicable constituent.

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

RWC – Receiving Water Concentration. It is the concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).

n – Is the number of samples.

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 is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request.

### APPENDIX – ALTERNATIVE:



**APPENDIX – COST ANALYSIS FOR COMPLIANCE:**

**Missouri Department of Natural Resources  
Water Protection Program  
Cost Analysis for Compliance  
(In accordance with RSMo 644.145)**

**Troy Highway 47 WWTF and Troy Southeast WWTF, Permit Renewal  
City of Troy  
Missouri State Operating Permits #MO-0054623 and #MO-0131296**

Section 644.145 RSMo requires the Department of Natural Resources (Department) to make a “finding of affordability” when “issuing permits under” or “enforcing provisions of” state or federal clean water laws “pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works.” This cost analysis does not dictate how the permittee will comply with new permit requirements.

**New Permit Requirements**

**Troy Highway 47 WWTF**

**Outfall #003:** Monthly monitoring (influent and effluent\*) Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrites + Nitrates; monthly monitoring (influent) for Ammonia as N  
\* - increased from quarterly

This permit also includes final effluent limits for Total Recoverable Cadmium, Lead, Selenium, and Thallium. No costs are anticipated for the new Lead requirements as the facility is consistently capable of maintaining compliance with the newly established final effluent limits. The costs for complying with new Cadmium, Selenium, and Thallium limits are unknown as many of the data points utilized in this determination were not sufficiently sensitive and the City is currently working with the Department’s financial assistance program to eliminate the discharge by connecting flows to the Troy Southeast WWTF.

**Troy Southeast WWTF**

**Outfall #001:** Monthly monitoring (influent and effluent) Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrites + Nitrates; monthly monitoring (influent) for Ammonia as N; Quarterly monitoring for Total Recoverable Copper

**SM1:** Monthly monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrites + Nitrates, and Ammonia as N

**SM2:** Quarterly monitoring for Total Hardness

**Other:** A Chronic WET test once per permit cycle and the development of a Stormwater Pollution Prevention Plan (SWPPP)

**Connections**

The number of connections was reported by the permittee on the Financial Questionnaire.

Connection Type	Number
Residential	4,102
Commercial	432
Industrial	0
<b>Total</b>	<b>4,534</b>

**Data Collection for this Analysis**

This cost analysis is based on data available to the Department as provided by the permittee and data obtained from readily available sources. For the most accurate analysis, it is essential that the permittee provides the Department with current information about the City’s financial and socioeconomic situation. The financial questionnaire available to permittees on the Department’s website (<https://dnr.mo.gov/document-search/financial-questionnaire-mo-780-2511>) is a required attachment to the permit renewal application. If the financial questionnaire is not submitted with the renewal application, the Department sends a request to complete the form with the welcome correspondence. If certain data was not provided by the permittee to the Department and the data is not obtainable through readily available sources, this analysis will state that the information is “unknown”.

### Eight Criteria of 644.145 RSMo

The Department must consider the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with new permit requirements.

#### (1) A community's financial capability and ability to raise or secure necessary funding;

Criterion 1 Table. Current Financial Information for the City of Troy	
Current Monthly User Rates per 5,000 gallons*	\$39.25
Median Household Income (MHI) <sup>1</sup>	\$52,526
Current Annual Operating Costs (excludes depreciation)	\$1,596,965

\* User Rates were reported by the permittee on the Financial Questionnaire.

#### (2) Affordability of pollution control options for the individuals or households at or below the median household income level of the community;

The following tables outline the estimated costs of the new permit requirements:

Criterion 2A Table. Estimated Cost Breakdown of New Permit Requirements			
New Requirement	Frequency	Estimated Cost	Estimated Annual Cost
<b>Troy Highway 47 WWTF</b>			
Total Phosphorus sampling (influent and effluent)	Monthly	\$24	\$480
Total Kjeldahl Nitrogen sampling (influent and effluent)	Monthly	\$33	\$660
Nitrites sampling (influent and effluent)	Monthly	\$20	\$400
Nitrates sampling (influent and effluent)	Monthly	\$20	\$400
Ammonia as N sampling (influent)	Monthly	\$20	\$240
Troy Highway 47 WWTF Estimated Annual Cost of New Permit Requirements			\$2,180
<b>Troy Southeast WWTF</b>			
Total Phosphorus sampling (influent, effluent, and instream)	Monthly	\$24	\$864
Total Kjeldahl Nitrogen sampling (influent, effluent, and instream)	Monthly	\$33	\$1,188
Nitrites sampling (influent, effluent, and instream)	Monthly	\$20	\$720
Nitrates sampling (influent, effluent, and instream)	Monthly	\$20	\$720
Ammonia as N sampling (influent and instream)	Monthly	\$20	\$480
Total Recoverable Copper sampling	Quarterly	\$30	\$120
Total Hardness sampling	Quarterly	\$47	\$188
Chronic WET test	Once every 5 years	\$1,550	\$310
SWPPP	Costs estimated for 5 years	\$10,000	\$2,000
Troy Southeast WWTF Estimated Annual Cost of New Permit Requirements			\$6,590
Total Estimated Annual Cost of New Permit Requirements			<b>\$8,770</b>

<b>Criterion 2B Table. Estimated Costs for New Permit Requirements</b>		
(1)	Estimated Annual Cost	\$8,770
(2)	Estimated Monthly User Cost for New Requirements <sup>2</sup>	\$0.16
	Estimated Monthly User Cost for New Requirements as a Percent of MHI <sup>3</sup>	0.004%
(3)	Total Monthly User Cost*	\$39.41
	Total Monthly User Cost as a Percent of MHI <sup>4</sup>	0.90%

\* Current User Rate + Estimated Monthly Costs of New Sampling Requirements

Due to the minimal cost associated with new permit requirements, the Department anticipates an extremely low to no rate increase will be necessary, which could impact individuals or households of this community.

### **(3) An evaluation of the overall costs and environmental benefits of the control technologies;**

This analysis is being conducted based on new requirements in the permit, which will not require the addition of new control technologies at the facility. However, the new sampling requirements are being established in order to provide data regarding the health of the receiving stream's aquatic life and to ensure that the existing permit limits are providing adequate protection of aquatic life. Improved wastewater provides benefits such as avoided health costs due to water-related illness, enhanced environmental ecosystem quality, and improved natural resources. The preservation of natural resources has been proven to increase the economic value and sustainability of the surrounding communities. Maintaining Missouri's water quality standards fulfills the goal of restoring and maintaining the chemical, physical, and biological integrity of the receiving stream; and, where attainable, it achieves a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

#### **Nutrient Monitoring**

Nutrients are mineral compounds that are required for organisms to grow and thrive. Of the six (6) elemental macronutrients, nitrogen and phosphorus are generally not readily available and limit growth of organisms. Excess nitrogen and phosphorus will cause a shift in the ecosystem's food web. Once excess nitrogen and phosphorus are introduced into a waterbody, some species' populations will dramatically increase, while other populations will not be able to sustain life. Competition and productivity are two factors in which nutrients can alter aquatic ecosystems and the designated uses of a waterbody. For example, designated uses, such as drinking water sources and recreational uses, become impaired when algal blooms take over a waterbody. These blooms can cause foul tastes and odors in the drinking water, unsightly appearance, and fish mortality in the waterbody. Some algae also produce toxins that may cause serious adverse health conditions such as liver damage, tumor promotion, paralysis, and kidney damage. The monitoring requirements for nitrogen and phosphorus have been added to the permit to provide data regarding the health of the receiving stream's aquatic life. A healthy ecosystem is beneficial as it provides reduced impacts on human and aquatic health as well as recreational opportunities.

#### **Stormwater Pollution Prevention Plan (SWPPP)**

Stormwater runoff is water from rain or snowmelt that does not immediately infiltrate into the ground and flows over or through natural or man-made storage or conveyance systems. When undeveloped areas are converted to land uses with impervious surfaces such as buildings, parking lots, and roads, the natural hydrology of the land is altered and can result in increased surface runoff rates, volumes, and pollutant loads. Stormwater runoff picks up industrial pollutants and typically discharges them directly into nearby waterbodies or indirectly via storm sewer systems. Runoff from areas where industrial activities occur can contain toxic pollutants (e.g., heavy metals and organic chemicals) and other pollutants such as trash, debris, and oil and grease, when facility practices allow exposure of industrial materials to stormwater. This increased flow and pollutant load can impair waterbodies, degrade biological habitats, pollute drinking water sources, and cause flooding and hydrologic changes to the receiving water, such as channel erosion. Industrial facilities typically perform a portion of their activities in outdoor areas exposed to the elements. This may include activities such as material storage and handling, vehicle fueling and maintenance, shipping and receiving, and salt storage, all of which can result in pollutants being exposed to precipitation and capable of being carried off in stormwater runoff. Also, facilities may have performed industrial activities outdoors in the past and materials from those activities still remain exposed to precipitation. In addition, accidental spills and leaks, improper waste disposal, and illicit connections to storm sewers may also lead to exposure of pollutants to stormwater.

A SWPPP is a written document that identifies the industrial activities conducted at the site, including any structural control practices, which the industrial facility operator will implement to prevent pollutants from making their way into stormwater runoff. The SWPPP also must include descriptions of other relevant information, such as the physical features of the facility, and procedures for spill prevention, conducting inspections, and training of employees. The SWPPP is intended to be a "living" document, updated as necessary, such that when industrial activities or stormwater control practices are modified or replaced, the SWPPP is similarly revised to reflect these changes.

### Whole Effluent Toxicity (WET) test

The WET Test is a quantifiable method of determining if discharge from a facility may be causing toxicity to aquatic life by itself or in combination with receiving stream water. WET tests are required under 10 CSR 20-6.010(8)(A)4 to be performed by specialists properly trained in conducting the test according to 40 CFR 136. This test will help ensure that the existing permit limits are providing adequate protection for aquatic life.

#### (4) Inclusion of ongoing costs of operating and maintaining the existing wastewater collection and treatment system, including payments on outstanding debts for wastewater collection and treatment systems when calculating projected rates:

The community reported that their outstanding debt for their current wastewater collection and treatment systems is \$5,524,000. The community reported that each user pays \$39.25 monthly, of which, \$19.10 is used toward payments on the current outstanding debt.

#### (5) An inclusion of ways to reduce economic impacts on distressed populations in the community, including but not limited to low and fixed income populations. This requirement includes but is not limited to:

- (a) Allowing adequate time in implementation schedules to mitigate potential adverse impacts on distressed populations resulting from the costs of the improvements and taking into consideration local community economic considerations.
- (b) Allowing for reasonable accommodations for regulated entities when inflexible standards and fines would impose a disproportionate financial hardship in light of the environmental benefits to be gained.

The following table characterizes the current overall socioeconomic condition of the community as compared to the overall socioeconomic condition of Missouri. The following information was compiled using the latest U.S. Census data.

**Criterion 5 Table. Socioeconomic Data <sup>1, 5-9</sup> for the City of Troy**

No.	Administrative Unit	Troy City	Missouri State
1	Population (2016)	11,374	6,059,651
2	Percent Change in Population (2000-2016)	68.8%	8.3%
3	2016 Median Household Income (in 2017 Dollars)	\$52,526	\$50,417
4	Percent Change in Median Household Income (2000-2016)	-7.8%	-5.9%
5	Median Age (2016)	31.6	38.3
6	Change in Median Age in Years (2000-2016)	-0.5	2.2
7	Unemployment Rate (2016)	5.6%	6.6%
8	Percent of Population Below Poverty Level (2016)	11.7%	15.3%
9	Percent of Household Received Food Stamps (2016)	17.8%	13.0%
10	(Primary) County Where the Community Is Located	Lincoln County	

#### (6) An assessment of other community investments and operating costs relating to environmental improvements and public health protection;

The City of Troy is in the process of upgrading the Southeast WWTF in order to treat all wastewater generated within the City. The Highway 47 WWTF will be decommissioned and reconstructed into a lift station.

#### (7) An assessment of factors set forth in the United States Environmental Protection Agency's guidance, including but not limited to the "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development" that may ease the cost burdens of implementing wet weather control plans, including but not limited to small system considerations, the attainability of water quality standards, and the development of wet weather standards;

The new requirements associated with this permit will not impose a financial burden on the community, nor will they require the City of Troy to seek funding from an outside source.

#### (8) An assessment of any other relevant local community economic conditions.

The community did not report any other relevant local economic conditions.



## Conclusion and Finding

As a result of new regulations, the Department is proposing modifications to the current operating permit that may require the permittee to increase monitoring. The Department has considered the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with the new permit requirements.

This analysis examined whether the new sampling requirements affect the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. After reviewing the above criteria, the Department finds that the new sampling requirements may result in a low burden with regard to the community's overall financial capability and a low financial impact for most individual customers/households; therefore, the new permit requirements are affordable.

## References

1. (A) 2016 MHI in 2016 Dollar: United States Census Bureau. 2012-2016 American Community Survey 5-Year Estimates, Table B19013: Median Household Income in the Past 12 Months (in 2016 Inflation-Adjusted Dollars).  
[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_16\\_5YR\\_B19013&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B19013&prodType=table).  
(B) 2000 MHI in 1999 Dollar: U.S. Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC. <http://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf>.  
(C) 2017 CPI, 2016 CPI and 1999 CPI: For United States, United States Bureau of Labor Statistics (2017) Consumer Price Index - All Urban Consumers, United States City Average. All Items. 1982-84=100. [http://data.bls.gov/timeseries/CUUR0000SA0?data\\_tool=Xgtable](http://data.bls.gov/timeseries/CUUR0000SA0?data_tool=Xgtable). For Missouri State: United States Bureau of Labor Statistics (2017) Consumer Price Index - All Urban Consumers, Midwest Urban Areas, All Items. 1982-84=100. [http://data.bls.gov/timeseries/CUUR0200SA0?data\\_tool=Xgtable](http://data.bls.gov/timeseries/CUUR0200SA0?data_tool=Xgtable).  
(D) 2016 MHI in 2017 Dollar: 2016 MHI in 2016 Dollar x 2017 CPI / 2016 CPI; 2000 MHI in 2017 Dollar: 2000 MHI in 1999 Dollar x 2017 CPI / 1999 CPI.  
(E) Percent Change in Median Household Income (2000-2016) = (2016 MHI in 2017 Dollar - 2000 MHI in 2017 Dollar) / (2000 MHI in 2017 Dollars).
2.  $(8,770/4,534)/12 = \$0.16$  (Estimated Monthly User Cost for New Requirements)
3.  $(0.16/(\$52,526/12))100\% = 0.004\%$  (New Sampling Only)
4.  $(39.41/(\$52,526/12))100\% = 0.90\%$  (Total User Cost)
5. (A) Total Population in 2016: United States Census Bureau. 2012-2016 American Community Survey 5-Year Estimates, Table B01003: Total Population - Universe: Total Population.  
[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_16\\_5YR\\_B01003&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B01003&prodType=table).  
(B) Total Population in 2000: U.S. Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC. <http://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf>.  
(C) Percent Change in Population (2000-2016) = (Total Population in 2016 - Total Population in 2000) / (Total Population in 2000).
6. (A) Median Age in 2016: United States Census Bureau. 2012-2016 American Community Survey 5-Year Estimates, Table B01002: Median Age by Sex - Universe: Total population.  
[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_16\\_5YR\\_B01002&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B01002&prodType=table).  
(B) Median Age in 2000: For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC., Page 2. <https://www.census.gov/prod/cen2000/phc-1-1-pt1.pdf>. For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Age and Sex: 2000, Washington, DC., Pages 64-92. <http://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf>.  
(C) Change in Median Age in Years (2000-2016) = (Median Age in 2016 - Median Age in 2000).
7. United States Census Bureau. 2012-2016 American Community Survey 5-Year Estimates, B23025: Employment Status for the Population 16 Years and Over - Universe: Population 16 years and Over.  
[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_16\\_5YR\\_B23025&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B23025&prodType=table).
8. United States Census Bureau. 2012-2016 American Community Survey 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months.  
[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_16\\_5YR\\_S1701&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_S1701&prodType=table).
9. United States Census Bureau. 2012-2016 American Community Survey 5-Year Estimates, Table B22003: Receipt of Food Stamps/SNAP in the Past 12 Months by Poverty Status in the Past 12 Months for Households - Universe: Households.  
[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_16\\_5YR\\_B22003&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B22003&prodType=table).





STANDARD CONDITIONS FOR NPDES PERMITS  
ISSUED BY  
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES  
MISSOURI CLEAN WATER COMMISSION  
REVISED  
AUGUST 1, 2014

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

## Part I – General Conditions

### Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
  - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
  - b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.
2. **Monitoring Requirements.**
  - a. Records of monitoring information shall include:
    - i. The date, exact place, and time of sampling or measurements;
    - ii. The individual(s) who performed the sampling or measurements;
    - iii. The date(s) analyses were performed;
    - iv. The individual(s) who performed the analyses;
    - v. The analytical techniques or methods used; and
    - vi. The results of such analyses.
  - b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.
3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.
4. **Test Procedures.** The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is “sufficiently sensitive” when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility’s discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.
5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee’s sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
  - a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
  - b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

### Section B – Reporting Requirements

1. **Planned Changes.**
  - a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
    - i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
    - ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
    - iii. The alteration or addition results in a significant change in the permittee’s sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
    - iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.
2. **Non-compliance Reporting.**
  - a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.



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- b. The following shall be included as information which must be reported within 24 hours under this paragraph.
    - i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
    - ii. Any upset which exceeds any effluent limitation in the permit.
    - iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.
  - c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.
3. **Anticipated Noncompliance.** The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.
  4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.
  5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.
  6. **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.
  7. **Discharge Monitoring Reports.**
    - a. Monitoring results shall be reported at the intervals specified in the permit.
    - b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
    - c. Monitoring results shall be reported to the Department no later than the 28<sup>th</sup> day of the month following the end of the reporting period.
- b. Notice.
    - i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
    - ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
  - c. Prohibition of bypass.
    - i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
      1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
      3. The permittee submitted notices as required under paragraph 2. b. of this section.
    - ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.
3. **Upset Requirements.**
    - a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
    - b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      - i. An upset occurred and that the permittee can identify the cause(s) of the upset;
      - ii. The permitted facility was at the time being properly operated; and
      - iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
      - iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
    - c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

## Section C – Bypass/Upset Requirements

1. **Definitions.**
  - a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
  - b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
  - c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. **Bypass Requirements.**
  - a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.

## Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
  - a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
  - b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement



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- imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
- c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.
- d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed \$10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.
2. **Duty to Reapply.**
- a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
- b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
- c. A permittee with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
5. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
6. **Permit Actions.**
- a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
- i. Violations of any terms or conditions of this permit or the law;
- ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
- iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
- iv. Any reason set forth in the Law or Regulations.
- b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
7. **Permit Transfer.**
- a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
- b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
- c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.
8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.



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10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.
11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
  - a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.
12. **Closure of Treatment Facilities.**
  - a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
  - b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.
13. **Signatory Requirement.**
  - a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
  - b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
  - c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.
14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.





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PART II - SPECIAL CONDITIONS – PUBLICLY OWNED  
TREATMENT WORKS  
SECTION A – INDUSTRIAL USERS

**1. Definitions**

Definitions as set forth in the Missouri Clean Water Laws and approved by the Missouri Clean Water Commission shall apply to terms used herein.

Significant Industrial User (SIU). Except as provided in the *General Pretreatment Regulation* 10 CSR 20-6.100, the term Significant Industrial User means:

1. All Industrial Users subject to Categorical Pretreatment Standards; and
2. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the Publicly-Owned Treatment Works (POTW) (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's or for violating any Pretreatment Standard or requirement.

Clean Water Act (CWA) is the the federal Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002).

**2. Identification of Industrial Discharges**

Pursuant to 40 CFR 122.44(j)(1), all POTWs shall identify, in terms of character and volume of pollutants, any Significant Industrial Users discharging to the POTW subject to Pretreatment Standards under section 307(b) of the CWA and 40 CFR 403.

**3. Application Information**

Applications for renewal or modification of this permit must contain the information about industrial discharges to the POTW pursuant to 40 CFR 122.21(j)(6)

**4. Notice to the Department**

Pursuant to 40 CFR 122.42(b), all POTWs must provide adequate notice of the following:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging these pollutants; and
2. Any substantial change into the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on:
  - i. the quality and quantity of effluent introduced into the POTW, and
  - ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

For POTWs without an approved pretreatment program, the notice of industrial discharges which was not included in the permit application shall be made as soon as practicable. For POTWs with an approved pretreatment program, notice is to be included in the annual pretreatment report required in the special conditions of this permit. Notice may be sent to:

Missouri Department of Natural Resources  
Water Protection Program  
Attn: Pretreatment Coordinator  
P.O. Box 176  
Jefferson City, MO 65102

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**PART III – BIOSOLIDS AND SLUDGE FROM DOMESTIC TREATMENT FACILITIES**

**SECTION A – GENERAL REQUIREMENTS**

1. PART III Standard Conditions pertain to biosolids and sludge requirements under the Missouri Clean Water Law and regulations for domestic and municipal wastewater and also incorporates federal sludge disposal requirements under 40 CFR Part 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR Part 503 for domestic biosolids and sludge.
2. PART III Standard Conditions apply only to biosolids and sludge generated at domestic wastewater treatment facilities, including public owned treatment works (POTW) and privately owned facilities.
3. Biosolids and Sludge Use and Disposal Practices:
  - a. The permittee is authorized to operate the biosolids and sludge generating, treatment, storage, use, and disposal facilities listed in the facility description of this permit.
  - b. The permittee shall not exceed the design sludge/biosolids volume listed in the facility description and shall not use biosolids or sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
  - c. For facilities operating under general operating permits that incorporate Standard Conditions PART III, the facility is authorized to operate the biosolids and sludge generating, treatment, storage, use and disposal facilities identified in the original operating permit application, subsequent renewal applications or subsequent written approval by the department.
4. Biosolids or Sludge Received from other Facilities:
  - a. Permittees may accept domestic wastewater biosolids or sludge from other facilities as long as the permittee's design sludge capacity is not exceeded and the treatment facility performance is not impaired.
  - b. The permittee shall obtain a signed statement from the biosolids or sludge generator or hauler that certifies the type and source of the sludge
5. Nothing in this permit precludes the initiation of legal action under local laws, except to the extent local laws are preempted by state law.
6. This permit does not preclude the enforcement of other applicable environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable biosolids or sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act or under Chapter 644 RSMo.
8. In addition to Standard Conditions PART III, the Department may include biosolids and sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Exceptions to Standard Conditions PART III may be authorized on a case-by-case basis by the Department, as follows:
  - a. The Department may modify a site-specific permit following permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR § 124.10, and 40 CFR § 501.15(a)(2)(ix)(E).
  - b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR Part 503.

## **SECTION B – DEFINITIONS**

1. Best Management Practices are practices to prevent or reduce the pollution of waters of the state and include agronomic loading rates (nitrogen based), soil conservation practices, spill prevention and maintenance procedures and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge.
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food, feed or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR Part 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR Part 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Feed crops are crops produced primarily for consumption by animals.
8. Fiber crops are crops such as flax and cotton.
9. Food crops are crops consumed by humans which include, but is not limited to, fruits, vegetables and tobacco.
10. Industrial wastewater means any wastewater, also known as process wastewater, not defined as domestic wastewater. Per 40 CFR Part 122.2, process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Land application of industrial wastewater, residuals or sludge is not authorized by Standard Conditions PART III.
11. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological contact systems, and other similar facilities. It does not include wastewater treatment lagoons or constructed wetlands for wastewater treatment.
12. Plant Available Nitrogen (PAN) is nitrogen that will be available to plants during the growing seasons after biosolids application.
13. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
14. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs), sewage sludge incinerator ash, or grit/screenings generated during preliminary treatment of domestic sewage.
15. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen or concrete lined basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
16. Septage is the sludge pumped from residential septic tanks, cesspools, portable toilets, Type III marine sanitation devices, or similar treatment works such as sludge holding structures from residential wastewater treatment facilities with design populations of less than 150 people. Septage does not include grease removed from grease traps at a restaurant or material removed from septic tanks and other similar treatment works that have received industrial wastewater. The standard for biosolids from septage is different from other sludges. See Section H for more information.

## **SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES**

1. Biosolids or sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and the requirements of Standard Conditions PART III or in accordance with Section A.3.c., above.
2. The permittee shall operate storage and treatment facilities, as defined by Section 644.016(23), RSMo, so that there is no biosolids or sludge discharged to waters of the state. Agricultural storm water discharges are exempt under the provisions of Section 644.059, RSMo.
3. Mechanical treatment plants shall have separate biosolids or sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove biosolids or sludge from these storage compartments on the required design schedule is a violation of this permit.

## **SECTION D – BIOSOLIDS OR SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR BY CONTRACT HAULER**

1. Permittees that use contract haulers, under the authority of their operating permit, to dispose of biosolids or sludge, are responsible for compliance with all the terms of this permit. Contract haulers that assume the responsibility of the final disposal of biosolids or sludge, including biosolids land application, must obtain a Missouri State Operating Permit unless the hauler transports the biosolids or sludge to another permitted treatment facility.
2. Testing of biosolids or sludge, other than total solids content, is not required if biosolids or sludge are hauled to a permitted wastewater treatment facility, unless it is required by the accepting facility.



## **SECTION E – INCINERATION OF SLUDGE**

1. Please be aware that sludge incineration facilities may be subject to the requirements of 40 CFR Part 503 Subpart E, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or, if the ash is determined to be hazardous, with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, mass of sludge incinerated and mass of ash generated. Permittee shall also provide the name of the ash disposal facility and permit number if applicable.

## **SECTION F – SURFACE DISPOSAL SITES AND BIOSOLIDS AND SLUDGE LAGOONS**

1. Please be aware that surface disposal sites of biosolids or sludge from wastewater treatment facilities may be subject to other laws including the requirements in 40 CFR Part 503 Subpart C, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Biosolids or sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain biosolids or sludge storage lagoons as storage facilities, accumulated biosolids or sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of biosolids or sludge removed will be dependent on biosolids or sludge generation and accumulation in the facility. Enough biosolids or sludge must be removed to maintain adequate storage capacity in the facility.
  - a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of biosolids or sludge on the bottom of the lagoon, upon prior approval of the Department; or
  - b. Permittee shall close the lagoon in accordance with Section I.

## **SECTION G – LAND APPLICATION OF BIOSOLIDS**

1. The permittee shall not land apply biosolids unless land application is authorized in the facility description, the special conditions of the issued NPDES permit, or in accordance with Section A.3.c., above.
2. This permit only authorizes “Class A” or “Class B” biosolids derived from domestic wastewater to be land applied onto grass land, crop land, timber, or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.
3. Class A Biosolids Requirements: Biosolids shall meet Class A requirements for application to public contact sites, residential lawns, home gardens or sold and/or given away in a bag or other container.
4. Class B biosolids that are land applied to agricultural and public contact sites shall comply with the following restrictions:
  - a. Food crops that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
  - b. Food crops below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
  - c. Food crops below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
  - d. Animal grazing shall not be allowed for 30 days after application of biosolids.
  - e. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
  - f. Turf shall not be harvested for one year after application of biosolids if used for lawns or high public contact sites in close proximity to populated areas such as city parks or golf courses.
  - g. After Class B biosolids have been land applied to public contact sites with high potential for public exposure, as defined in 40 CFR § 503.31, such as city parks or golf courses, access must be restricted for 12 months.
  - h. After Class B biosolids have been land applied public contact sites with low potential for public exposure as defined in 40 CFR § 503.31, such as a rural land application or reclamation sites, access must be restricted for 30 days.
5. Pollutant limits
  - a. Biosolids shall be monitored to determine the quality for regulated pollutants listed in Table 1, below. Limits for any pollutants not listed below may be established in the permit.
  - b. The number of samples taken is directly related to the amount of biosolids or sludge produced by the facility (See Section J, below). Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable Department approved material to achieve pollutant concentration below those identified in Table 1, below.
  - c. Table 1 gives the ceiling concentration for biosolids. Biosolids which exceed the concentrations in Table 1 may not be land applied.

**TABLE 1**

Biosolids ceiling concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

- d. Table 2 below gives the low metal concentration for biosolids. Because of its higher quality, biosolids with pollutant concentrations below those listed in Table 2 can safely be applied to agricultural land, forest, public contact sites, lawns, home gardens or be given away without further analysis. Biosolids containing metals in concentrations above the low metals concentrations but below the ceiling concentration limits may be land applied but shall not exceed the annual loading rates in Table 3 and the cumulative loading rates in Table 4. The permittee is required to track pollutant loading onto application sites for parameters that have exceeded the low metal concentration limits.

**TABLE 2**

Biosolids Low Metal Concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

- e. Annual pollutant loading rate.

**Table 3**

Biosolids Annual Loading Rate	
Pollutant	Kg/ha (lbs./ac) per year
Arsenic	2.0 (1.79)
Cadmium	1.9 (1.70)
Copper	75 (66.94)
Lead	15 (13.39)
Mercury	0.85 (0.76)
Nickel	21 (18.74)
Selenium	5.0 (4.46)
Zinc	140 (124.96)

- f. Cumulative pollutant loading rates.

**Table 4**

Biosolids Cumulative Pollutant Loading Rate	
Pollutant	Kg/ha (lbs./ac)
Arsenic	41 (37)
Cadmium	39 (35)
Copper	1500 (1339)
Lead	300 (268)
Mercury	17 (15)
Nickel	420 (375)
Selenium	100 (89)
Zinc	2800 (2499)

6. Best Management Practices. The permittee shall use the following best management practices during land application activities to prevent the discharge of biosolids to waters of the state.
- Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under § 4 of the Endangered Species Act or its designated critical habitat.
  - Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
  - The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop

nitrogen removal when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kgTN; or 2) When biosolids are land applied at an application rate greater than two dry tons per acre per year.

- i. PAN can be determined as follows:  
(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor<sup>1</sup>).  
<sup>1</sup> Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
  - ii. Crop nutrient production/removal to be based on crop specific nitrogen needs and realistic yield goals. **NOTE:** There are a number of reference documents on the Missouri Department of Natural Resources website that are informative to implement best management practices in the proper management of biosolids, including crop specific nitrogen needs, realistic yields on a county by county basis and other supporting references.
  - iii. Biosolids that are applied at agronomic rates shall not cause the annual pollutant loading rates identified in Table 3 to be exceeded.
- d. Buffer zones are as follows:
- i. 300 feet of a water supply well, sinkhole, water supply reservoir or water supply intake in a stream;
  - ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstanding state resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;
  - iii. 150 feet of dwellings or public use areas;
  - iv. 100 feet (35 feet if biosolids application is down-gradient or the buffer zone is entirely vegetated) of lake, pond, wetlands or gaining streams (perennial or intermittent);
  - v. 50 feet of a property line. Buffer distances from property lines may be waived with written permission from neighboring property owner.
  - vi. For the application of dry, cake or liquid biosolids that are subsurface injected, buffer zones identified in 5.d.i. through 5.d.iii above, may be reduced to 100 feet. The buffer zone may be reduced to 35 feet if the buffer zone is permanently vegetated. Subsurface injection does not include methods or technology reflective of combination surface/shallow soil incorporation.
- e. Slope limitation for application sites are as follows:
- i. For slopes less than or equal to 6 percent, no rate limitation;
  - ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels;
  - iii. Slopes > 12 percent, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.
  - iv. Dry, cake or liquid biosolids that are subsurface injected, may be applied on slopes not to exceed 20 percent. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation.
- f. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
- g. Biosolids may be land applied to sites with soil that are snow covered, frozen, or saturated with liquid when site restrictions or other controls are provided to prevent pollutants from being discharged to waters of the state during snowmelt or stormwater runoff. During inclement weather or unfavorable soil conditions use the following management practices:
- i. A maximum field slope of 6% and a minimum 300 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be utilized for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
  - ii. A maximum field slope of 2% and 100 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be used for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
  - iii. Other best management practices approved by the Department.

## SECTION H – SEPTAGE

1. Haulers that land apply septage must obtain a state permit. An operating permit is not required for septage haulers who transport septage to another permitted treatment facility for disposal.
2. Do not apply more than 30,000 gallons of septage per acre per year or the volume otherwise stipulated in the operating permit.
3. Septic tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to mechanical treatment facilities.
4. Septage must comply with Class B biosolids regarding pathogen and vector attraction reduction requirements before it may be applied to crops, pastures or timberland. To meet required pathogen and vector reduction requirements, mix 50 pounds of hydrated lime for every 1,000 gallons of septage and maintain a septage pH of at least 12 pH standard units for 30 minutes or more prior to application.
5. Lime is to be added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.
6. As residential septage contains relatively low levels of metals, the testing of metals in septage is not required.

## SECTION I– CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical and lagoons) and sludge or biosolids storage and treatment facilities. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain Department approval of a closure plan which addresses proper removal and disposal of all sludges and/or biosolids. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6.010 and 10 CSR 20 – 6.015.
3. Biosolids or sludge that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
  - a. Biosolids and sludge shall meet the monitoring and land application limits for agricultural rates as referenced in Section G, above.
  - b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
  - c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre. Alternative, site-specific application rates may be included in the closure plan for department consideration.
    - i. PAN can be determined as follows:
$$(\text{Nitrate} + \text{nitrite nitrogen}) + (\text{organic nitrogen} \times 0.2) + (\text{ammonia nitrogen} \times \text{volatilization factor}^1).$$
<sup>1</sup> Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
4. Domestic wastewater treatment lagoons with a design treatment capacity less than or equal to 150 persons, are “similar treatment works” under the definition of septage. Therefore the sludge within the lagoons may be treated as septage during closure activities. See Section B, above. Under the septage category, residuals may be left in place as follows:
  - a. Testing for metals or fecal coliform is not required.
  - b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
  - c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Biosolids or sludge left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, and unless otherwise approved, the lagoon berm shall be demolished, and the site shall be graded and contain  $\geq 70\%$  vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. Alternative biosolids or sludge and soil mixing ratios may be included in the closure plan for department consideration.
6. Lagoon and earthen structure closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200.
7. When closing a mechanical wastewater plant, all biosolids or sludge must be cleaned out and disposed of in accordance with the Department approved closure plan before the permit for the facility can be terminated.
  - a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the Department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain  $\geq 70\%$  vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate

- surface water drainage without creating erosion.
- b. Hazardous Waste shall not be land applied or disposed during mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations pursuant to 10 CSR 25.
  - c. After demolition of the mechanical plant, the site must only contain clean fill defined in Section 260.200.1(6) RSMo as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Department for fill, reclamation, or other beneficial use. Other solid wastes must be removed.
8. If biosolids or sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or I, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR Part 503, Subpart C.

## SECTION J – MONITORING FREQUENCY

1. At a minimum, biosolids or sludge shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

**TABLE 5**

Biosolids or Sludge produced and disposed (Dry Tons per Year)	Monitoring Frequency (See Notes 1, and 2)		
	Metals, Pathogens and Vectors, Total Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN <sup>1</sup>	Priority Pollutants <sup>2</sup>
319 or less	1/year	1 per month	1/year
320 to 1650	4/year	1 per month	1/year
1651 to 16,500	6/year	1 per month	1/year
16,501+	12/year	1 per month	1/year

<sup>1</sup> Calculate plant available nitrogen (PAN) when either of the following occurs: 1) when biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.

<sup>2</sup> Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) are required only for permit holders that must have a pre-treatment program. Monitoring requirements may be modified and incorporated into the operating permit by the Department on a case-by-case basis.

Note 1: Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.

Note 2: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. Permittees that operate wastewater treatment lagoons, peak flow equalization basins, combined sewer overflow basins or biosolids or sludge lagoons that are cleaned out once a year or less, may choose to sample only when the biosolids or sludge is removed or the lagoon is closed. Test one composite sample for each 319 dry tons of biosolids or sludge removed from the lagoon during the reporting year or during lagoon closure. Composite sample must represent various areas at one-foot depth.
3. Additional testing may be required in the special conditions or other sections of the permit.
4. Biosolids and sludge monitoring shall be conducted in accordance with federal regulation 40 CFR § 503.8, Sampling and analysis.

## SECTION K – RECORD KEEPING AND REPORTING REQUIREMENTS

1. The permittee shall maintain records on file at the facility for at least five years for the items listed in Standard Conditions PART III and any additional items in the Special Conditions section of this permit. This shall include dates when the biosolids or sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
  - a. By February 19<sup>th</sup> of each year, applicable facilities shall submit an annual report for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and biosolids or sludge disposal facilities.
  - b. Permittees with wastewater treatment lagoons shall submit the above annual report only when biosolids or sludge are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Form. The annual report shall be prepared on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:  
Major facilities, which are those serving 10,000 persons or more or with a design flow equal to or greater than 1 million gallons per day or that are required to have an approved pretreatment program, shall report to both the Department and EPA if the facility land applied, disposed of biosolids by surface disposal, or operated a sewage sludge incinerator. All other facilities shall maintain their biosolids or sludge records and keep them available to Department personnel upon request. State reports shall be submitted to the address listed as follows:

DNR regional or other applicable office listed in the  
permit (see cover letter of permit)  
ATTN: Sludge Coordinator

Reports to EPA must be electronically submitted online via the Central Data Exchange at: <https://cdx.epa.gov/> Additional information is available at: <https://www.epa.gov/biosolids/compliance-and-annual-reporting-guidance-about-clean-water-act-laws>

5. Annual report contents. The annual report shall include the following:
  - a. Biosolids and sludge testing performed. If testing was conducted at a greater frequency than what is required by the permit, all test results must be included in the report.
  - b. Biosolids or sludge quantity shall be reported as dry tons for the quantity produced and/or disposed.
  - c. Gallons and % solids data used to calculate the dry ton amounts.
  - d. Description of any unusual operating conditions.
  - e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
    - i. This must include the name and address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
    - ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
  - f. Contract Hauler Activities:

If using a contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate biosolids or sludge use permit.
  - g. Land Application Sites:
    - i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. The facility shall report PAN when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.
    - ii. If the “Low Metals” criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
    - iii. Report the method used for compliance with pathogen and vector attraction requirements.
    - iv. Report soil test results for pH and phosphorus. If no soil was tested during the year, report the last date when tested and the results.