STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Susan Spiegel, P.E.
Director of Public Works
City of Wentzville
1001 Schroeder Creek Boulevard
Wentzville, MO 63385

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

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

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

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

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

March 17, 2021
Effective Date

March 16, 2023
Expiration Date

Edward B. Galbraith, Director, Division of Environmental Quality

Chris Wieberg, Director, Water Protection Program
CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Modification to an existing activated sludge wastewater treatment facility. Modify influent flow splitter box. In east treatment train convert treatment unit #2 to be exclusively an aerobic sludge digester by removing internal equipment and clarifier parts, and modifying piping. In west treatment train: modify aeration basin #5 by removing interim baffles, adding recycle pumps and replacing mixers; and add a new aeration basin of similar capacity (approximately 1,740,000 gallons) and operation as existing basin; to be designated basin #6.

This project will also include general site work appropriate to the scope and purpose of the project, and all necessary appurtenances to make a complete and usable wastewater treatment facility. Design flow of facility will increase to 7.04 MGD, the outfall will remain at the existing location. Discharge is to McCoy Creek in Landgrant 00935, St. Charles County.

II. COST ANALYSIS FOR COMPLIANCE

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

The Department is not required to determine Cost Analysis for Compliance because the permit contains no new conditions or requirements that convey a new cost to the facility.

III. CONSTRUCTION PERMIT CONDITIONS

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

1. This construction permit does not authorize discharge.

2. All construction shall be consistent with plans and specifications signed and sealed by: Amanda B. Bagwell, PE; David L. Wiseman, PE; Ronald Blaine Hardee, PE; Thomas Keith Boyd, III, PE; Kevin K. Thernes, PE; and David G. Bunch, PE, HDR Inc.
3. The Department must be contacted in writing prior to making any changes to the plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the Department’s St. Louis Regional Office per 10 CSR 20-7.015(9)(G).

5. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.

6. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation per 10 CSR 20-8.140(2)(B). The minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300') per 10 CSR 20-8.140(2)(C)1.

7. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the Department’s ePermitting system available online at dnr.mo.gov/env/wpp/epermit/help.htm. See dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.

8. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department’s Water Protection Program at 573-751-1300 for more information. See dnr.mo.gov/env/wpp/401/ for more information.

9. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.

**10 CSR 20-8.140 Wastewater Treatment Facilities**

- Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation. 10 CSR 20-8.140 (2) (B)
- Unless another distance is determined by the Missouri Geological Survey or by the department’s Public Drinking Water Branch, the minimum distance between
wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300'). 10 CSR 20-8.140 (2) (C) 1.
- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140 (2) (D)
- The alarm shall be activated in cases of high water levels. Follow the provisions in subsection (7)(C) of this rule for alarm systems. 10 CSR 20-8.140 (4) (D)
- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140 (7) (A) 1.
- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 National Electric Code (NEC) (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140 (7) (B)
- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140 (7) (C)
- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140 (7) (D) 1.
- Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department’s Public Drinking Water Branch shall be provided. 10 CSR 20-8.140 (7) (D) 3. A.
- For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 3. B.
- Where a separate non-potable water supply is to be provided, a break tank will not be necessary, but all system outlets shall be posted with a permanent sign indicating the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 4.
- A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140 (7) (E)
- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility:
  - Fencing, Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140 (8) (A)
  - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140 (8) (B)
  - First aid equipment; 10 CSR 20-8.140 (8) (C)
  - Posted “No Smoking” signs in hazardous areas; 10 CSR 20-8.140 (8) (D)
  - Appropriate personal protective equipment (PPE); 10 CSR 20-8.140 (8) (E)
  - Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140 (8) (F)
- 10 CSR 20-8.140 (8) (G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
- 10 CSR 20-8.140 (8) (H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
- Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140 (8) (I)
- Ventilation shall include the following:
  - Isolate all pumping stations and wastewater treatment components installed in a building where other equipment or offices are located from the rest of the building by an air-tight partition, provide separate outside entrances, and provide separate and independent fresh air supply; 10 CSR 20-8.140 (8) (J) 1.
  - Force fresh air into enclosed screening device areas or open pits more than four feet (4') deep. 10 CSR 20-8.140 (8) (J) 2.
  - Dampers are not to be used on exhaust or fresh air ducts. Avoid the use of fine screens or other obstructions on exhaust or fresh air ducts to prevent clogging; 10 CSR 20-8.140 (8) (J) 3.
  - Where continuous ventilation is needed (e.g., housed facilities), provide at least twelve (12) complete air changes per hour. Where continuous ventilation would cause excessive heat loss, provide intermittent ventilation of at least thirty (30) complete air changes per hour when facility personnel enter the area. Base air change demands on one hundred percent (100%) fresh air; 10 CSR 20-8.140 (8) (J) 4.
  - Electrical controls. Mark and conveniently locate switches for operation of ventilation equipment outside of the wet well or building. Interconnect all intermittently operated ventilation equipment with the respective wet well, dry well, or building lighting system. The manual lighting/ventilation switch is expected to override the automatic controls. For a two (2) speed ventilation system with automatic switch over where gas detection equipment is installed, increase the ventilation rate automatically in response to the detection of hazardous concentrations of gases or vapors; 10 CSR 20-8.140 (8) (J) 5.
  - Fabricate the fan wheel from non-sparking material. Provide automatic heating and dehumidification equipment in all dry wells and buildings. 10 CSR 20-8.140 (8) (J) 6.
Safety in the Workplace (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140 (8) (M)

10 CSR 20-8.170 Solids Handling and Disposal.

- Piping galleries shall be ventilated in accordance with paragraph (4)(C)4. of this rule. 10 CSR 20-8.170 (4) (C) 2.
- Electrical fixtures, equipment, and controls. Electrical fixtures, equipment, and controls shall comply with the National Electrical Manufacturers Association (NEMA) 4X enclosure rating where necessary; NEMA Standard 250-2014, published December 15, 2014. This standard shall hereby be incorporated by reference into this rule, as published by National Electrical Manufacturers Association, 1300 North 17th Street, Arlington, VA 22209. This rule does not incorporate any subsequent amendments or additions. Electrical equipment, fixtures, and controls, in places enclosing and adjacent to anaerobic digestive appurtenances where hazardous gases are included. 10 CSR 20-8.170 (4) (C) 3.
- Water supplies using indirect connections shall comply with 10 CSR 20-8.140(7)(D). 10 CSR 20-8.170 (4) (D)
- Aerobic Solids Digestion High Level Emergency Overflow. An unvalved emergency overflow shall be provided that will convey digester overflow to the treatment plant headworks, the aeration process, or to another liquid sludge storage facility and that has an alarm for high level conditions. 10 CSR 20-8.170 (5)
- For solids pumping systems, audio-visual alarms shall be provided in accordance with 10 CSR 20-8.140(7)(C) for:
  - Pump failure; 10 CSR 20-8.170 (6) (A)
  - Pressure loss; 10 CSR 20-8.170 (6) (B) and
  - High pressure. 10 CSR 20-8.170 (6) (C)

10. Upon completion of construction:

A. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications; and

B. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N)

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

Construction is to increase the design flow to 7.04 MGD from 5.33 MGD, and also enhance performance and improve operability. Improvements will enable facility to meet all final limits in the proposed permit. Construction includes the addition of an activated sludge aeration basin and improvements to the existing aeration basin #5 in the west treatment train; and the conversion of treatment unit #2 in the east train to be exclusively an aerobic sludge digester.
2. **FACILITY DESCRIPTION**

The Wentzville Water Reclamation Center is located at 2455 Mette Road, Wentzville, in St. Charles County, Missouri. The existing facility is an activated sludge treatment facility with a design average flow of 5.33 MGD. The facility will be upgraded to a design average flow of 7.04 MGD. After construction the facility description is as follows:

Influent wastewater enters the wastewater treatment plant via three influent lift stations / 2 mechanical bar screens / 1 manual bar screen / 2 aerated cyclone grit chambers / influent then enters the Influent Flow Splitter Structure, which splits the influent flow between the East Treatment Train and the West Treatment Train

East Treatment Train: Aerated equalization basin / 2 circular multi-zone activated sludge units with integral final clarifiers

West Treatment Train: 2 rectangular multi-zone activated sludge basins / 2 final clarifiers

Effluent from the East Treatment Train and West Treatment Train is then rejoined and receives UV disinfection and then enters the post aeration basin prior to discharge at Outfall #003

Sludge from both treatment trains are pumped to the 4 aerobic sludge digesters / three sludge/biosolids holding tanks / frame and plate filter press / dewatered biosolids are stored on a covered concrete pad / biosolids are land applied

3. **COMPLIANCE PARAMETERS**

The proposed project is required to meet final effluent limits established in the Water Quality and Antidegradation Review Preliminary Determination on December 16, 2020. Also, the construction satisfies the Schedule of Compliance in Operating Permit MO-0093599 for meeting Selenium limits. The new limits from the antidegradation review and final Selenium limits are reflected in the draft Operating Permit placed on public notice February 5, 2021.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Monthly average limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemical Oxygen Demands</td>
<td>mg/L</td>
<td>18</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>mg/L</td>
<td>27</td>
</tr>
<tr>
<td>Ammonia as N-summer</td>
<td>mg/L</td>
<td>1.1</td>
</tr>
<tr>
<td>Ammonia as N-winter</td>
<td>mg/L</td>
<td>2.5</td>
</tr>
<tr>
<td>pH</td>
<td>SU</td>
<td>6.5-9.0</td>
</tr>
<tr>
<td>E. coli</td>
<td>#/100mL</td>
<td>206</td>
</tr>
</tbody>
</table>
4. ANTIDEGRADATION

The Department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review Preliminary Determination on December 16, 2020. The WQAR was required due to the increase in design flow. See APPENDIX – ANTIDEGRADATION.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The treatment facility is proposed to be upgraded with the following capital improvements:

- Influent splitter box will be modified to enable easier operation and adjustments.

- In the east treatment train; treatment unit #2 will be converted to an aerobic sludge digester by removing internal equipment and clarifier parts, and modifying piping.

- In the west treatment train. Aeration basin #5 will be modified by removing interim baffles, adding recycle pumps and replacing mixers. An activated sludge aeration basin will be added to be known as aeration basin #6. It will be of similar capacity of existing aeration basin #5 and contain the same new enhancements.

  - These improvements will increase the design flow to 7.04 MGD; the design peak hourly flow rate will be 18.7 MGD. The population equivalent changes to 61,824, based on one PE for every 0.17 lb. of BOD treated/day. Design sludge production of 1,113 dry tons/year is based on an estimated production of 0.018 dry tons of sludge/PE/year.

  - Influent flow splitter. Modifications to the Return Activated Sludge (RAS) piping at the Influent Flow Splitter Box to improve RAS mixing. Modifications to the Influent Flow Splitter Box to enable improved metering data, allowing better control over the wastewater flow diverted to the Equalization Basin and Treatment Units #3 and #4.

  - Aerobic Sludge Digester. Treatment Unit #2 to be converted to exclusively aerobic sludge digestion. Internal equipment and clarifier components will be removed. Piping and walls will be modified. Two separate digestion zones will be created. The final effective volume of this sludge digester will be approximately 650,000 cubic feet.

  - Aeration Basin #5 Improvements. Remove interim baffles, add recycle pumps and replace mixers. Provide one new mixer and one recycle pump to the swing zone (normally anaerobic); provide two new mixers and one recycle pump to the anoxic zone. Recycle pumps to be 4 HP and each have a capacity of 800 gpm, returns mixed liquor from aeration zone. Mixers to be hyperbolic, bridge mounted, 1.5 HP and 2.0 HP.
o New Aeration Basin #6. Construct concrete basin similar to existing Basin #5; typical water depth of approximately 18 feet; Swing zone volume 77,560 gal. with mixer and recycle pump; Anoxic zone volume 261,800 gallons, with 2 mixers, and recycle pump; Aeration zone volume 1,400,000 gallons, with fine bubble diffusers, air is supplied by existing aeration equipment.

o Existing two clarifiers in west train to serve aeration basin #5 and new aeration basin #6. Design flow through each basin and each clarifier is 1.82 MGD; design peak hourly flow through each is 5.10 MGD. Surface settling rate at peak hourly flow is 1015 gpd/sq. ft. Clarifiers are of adequate size to not exceed a maximum settling rate of 1200 gpd/sq. ft. at peak hourly flow rate. Process to provide biological nutrient reductions.

o Existing UV disinfection is adequate to provide disinfection to a flow rate of 23.4 MGD. This exceeds the Phase 3 Expansion design peak hourly flow rate of 18.1 MGD

6. OPERATING PERMIT

Operating permit MO-0093599 will require a modification to reflect the construction activities. The modified Wentzville Water Reclamation Center, MO-0093599, was successfully public noticed from February 5, 2021 to March 8, 2021 with no comments received. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued. The modification fee of $200.00 has been paid.

V. NOTICE OF RIGHT TO APPEAL

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

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

Andrew Appelbaum, P.E.
Engineering Section
andy.appelbaum@dnr.mo.gov
December 16, 2020

City of Wentzville
310 West Pearce Boulevard
Wentzville, MO 63385

RE: Water Quality and Antidegradation Review Preliminary Determination for Wentzville Water Reclamation Center WWTF, St. Charles County

Dear Susan Spiegel:

In accordance with the Missouri Antidegradation Rule and Implementation Procedure (AIP), your proposed discharge is subject to an Antidegradation Review. The revised Water Quality and Antidegradation Review (WQAR) summarizes this preliminary determination based upon your City of Wentzville, Missouri Water Reclamation Center Antidegradation Review Report dated July, 2018, which proposed to increase the facility’s design flow to 7.04 MGD. The revision reflects new methods for calculating copper limits according to Missouri’s recently revised Water Quality Standards and allows for slightly higher copper effluent concentrations.

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 Rule and 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 (Department) 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. 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.

You may proceed with submittal of an application for an operating permit and antidegradation review public notice, an engineering report, or a facility plan. These submittals must 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.

Following the Department’s public notice of 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.

Some projects are eligible for funding through the Department’s Clean Water State Revolving Fund (CWSRF) Program. Applications for funding and guidance documents can be found at https://dnr.mo.gov/env/wpp/srf/wastewater-project-guidance.htm. Project eligibility determinations are made, in accordance with 10 CSR 20-4.040. Projects that are eligible for funding are listed on the Intended Use Plan, provided additional CWSRF requirements are met, including but not limited to environmental review requirements, public hearing requirements, user charge requirements and approval of construction plans and specifications. For questions related to the CWSRF Program, please contact Joan Doerhoff, Financial Assistance Center Coordinator Unit Chief, at 573-526-0940.

If you should have questions, please feel free to contact Steve Hamm by telephone at 573-526-1002, by email at steven.hamm@dnr.mo.gov, or by mail at P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM

[Signature]
Cindy LePage, P.E., Chief
Engineering Section

Enclosures

CL:sht

cc: David Carani, HDR, Inc.
Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to
McCoy Creek

by
Wentzville Wastewater Treatment Facility

December, 2020
Table of Contents

1. Facility Information ................................................................. 14
2. Water Quality Information .......................................................... 14
2.1. Water Quality History: .............................................................. 14
3. Receiving Waterbody Information ............................................... 14
4. General Comments .................................................................... 15
5. Antidegradation Review Information ............................................ 15
5.1. TIER DETERMINATION ............................................................ 15
      Table 1. Pollutants of Concern and Tier Determination .................... 15
5.2. EXISTING WATER QUALITY ...................................................... 15
5.3. NO DISCHARGE EVALUATION .................................................. 16
5.4. LOSING STREAM ALTERNATIVE DISCHARGE LOCATION ................ 16
5.5. DEMONSTRATION OF INSIGNIFICANCE .................................. 16
      Table 2. Net Change in Loadings Based upon Current and Proposed Permit Limits ...................... 16
5.6. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE .................. 17
6. General Assumptions of the Water Quality and Antidegradation Review ........................................ 17
7. Mixing Considerations ................................................................ 17
8. Permit Limits and Monitoring Information ................................... 17
   TABLE 3. EFFLUENT LIMITS FOR OUTFALL #001 .......................... 17
9. Receiving Water Monitoring Requirements .................................... 18
10. Derivation and Discussion of Limits ............................................. 18
10.1. OUTFALL #001 – MAIN FACILITY OUTFALL ............................. 19
10.2. LIMIT DERIVATION ............................................................... 19
11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION ......................... 21
   Appendix A: Map of Discharge Location ....................................... 21
   Appendix B: Dissolved Oxygen Modeling using Streeter Phelps ............. 23
   Appendix C: Antidegradation Review Summary Attachments .................. 25
1. FACILITY INFORMATION

FACILITY NAME: Wentzville Water Reclamation Center
NPDES #: MO-0093599

FACILITY TYPE/DESCRIPTION:
FACILITY TYPE: POTW
FACILITY DESCRIPTION: The current permitted design flow is 6.4 MGD. The facility currently has peak flow equalization, screens and grit removal, extended aeration, and clarifiers. The proposed design flow will be 7.04 MGD.

COUNTY: St. Charles
UTM COORDINATES: X= 684925 / Y= 4303837
12- DIGIT HUC: 07110008-0408
LEGAL DESCRIPTION: Landgrant 145
EDU*: Central Plains
ECOREGION: Mississippi Hills River

* - Ecological Drainage Unit

2. WATER QUALITY INFORMATION

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

2.1. WATER QUALITY HISTORY:

McCoy Creek was on the 2016 Missouri 303 (d) List for dissolved oxygen; however, McCoy Creek has been delisted since the 2018 Missouri 303 (d) List. Within the past five years, the facility has only had a single permit exceedance in January 2019 for total suspended solids.

<table>
<thead>
<tr>
<th>OUTFALL</th>
<th>DESIGN FLOW (CFS)</th>
<th>TREATMENT LEVEL</th>
<th>RECEIVING WATERBODY</th>
<th>DISTANCE TO CLASSIFIED SEGMENT (MI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>9.92</td>
<td>Secondary</td>
<td>McCoy Creek</td>
<td>Directly Discharges</td>
</tr>
</tbody>
</table>

3. RECEIVING WATERBODY INFORMATION

<table>
<thead>
<tr>
<th>WATERBODY NAME</th>
<th>CLASS</th>
<th>WBID</th>
<th>LOW-FLOW VALUES (CFS)</th>
<th>DESIGNATED USES**</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCoy Creek</td>
<td>C</td>
<td>214</td>
<td>0.0 0.0 0.0</td>
<td>AQL, HHP, IRR, LWW, SCR, WBCB</td>
</tr>
</tbody>
</table>

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

RECEIVING WATER BODY SEGMENT #1: McCoy Creek
Upper end segment* UTM coordinates: X= 684925 / Y= 4303837 (outfall)
Lower end segment* UTM coordinates: X= 685460 / Y= 4304693 (confluence with tributary)

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

HDR Engineering, prepared, on behalf of Wentzville, the *Wentzville Wastewater Facility Antidegradation Review Report* dated July 2018.

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

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

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

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *Wentzville Wastewater Facility Antidegradation Review Report* dated July 2018.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix C). Pollutants of concern are defined as those pollutants “proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge.” (AIP, Page 7). Tier 2 is assumed for all POCs; however, tier determinations were not necessary with maintenance of mass loading determinations (see Appendix C).

<table>
<thead>
<tr>
<th>Pollutants of Concern</th>
<th>Tier*</th>
<th>Degradation</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODs/DO</td>
<td>*</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>**</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td>Ammonia as N</td>
<td>*</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>***</td>
<td>Insignificant</td>
<td>Permit limits applied</td>
</tr>
<tr>
<td>Oil &amp; Grease</td>
<td>*</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td>Copper, Total Recoverable</td>
<td>*</td>
<td>Insignificant</td>
<td></td>
</tr>
<tr>
<td>Bacteria/Escherichia coli (E. coli)</td>
<td>*</td>
<td>Insignificant</td>
<td>Permit limits applied</td>
</tr>
</tbody>
</table>

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

The following Antidegradation Review Summary attachments in Appendix C were used by the applicant:

For pollutants of concern, the attachments are:

- Attachment B, Tier 2 with minimal degradation.

5.2. EXISTING WATER QUALITY

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

According to 10 CSR 20-6.010 (4)(A)5.B., reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no discharge facility. Missouri’s antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required.

The Antidegradation Review Report prepared for Wentzville Water Reclamation Center describes a no discharge evaluation as a non-degrading alternative. Land irrigation is presented as infeasible due to site limitations including land application availability, water storage availability, and soil conditions. This alternative is estimated to cost above $91.5 million.

5.4. Losing Stream Alternative Discharge Location

Under 10 CSR 20-7.015(4) (A), discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons. The facility does not discharge to a losing stream segment or will not discharge within 2 miles of a losing stream segment.

5.5. Demonstration of Insignificance

In Section II.A of the Missouri’s Antidegradation Rule and Implementation Procedure, a demonstration of insignificance of the discharge requires the applicant to show a reduction, or maintenance of loading, i.e., no change in ambient water quality concentrations in the receiving waters. As demonstrated in Wentzville Wastewater Facility Antidegradation Review Report dated July, 2018, Table 2 below summarizes the results of current loading based on the current permit concentrations and proposed loadings based on the proposed permit concentrations.

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

<table>
<thead>
<tr>
<th>Pollutants of Concern</th>
<th>Current Weekly Average or Maximum Daily Limit (MG/L)</th>
<th>Proposed Maximum Daily Limit (Note 1) (MG/L)</th>
<th>Current Loading (lbs/day)</th>
<th>Proposed Loading (lbs/day)</th>
<th>Net Change (lbs/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODs</td>
<td>30</td>
<td>27</td>
<td>1601.3</td>
<td>1601.3</td>
<td>0</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>45</td>
<td>41</td>
<td>2401.9</td>
<td>2401.9</td>
<td>0</td>
</tr>
<tr>
<td>Ammonia (Summer)</td>
<td>6</td>
<td>5.5</td>
<td>320.3</td>
<td>320.3</td>
<td>0</td>
</tr>
<tr>
<td>Ammonia (Winter)</td>
<td>11</td>
<td>10</td>
<td>587.1</td>
<td>587.1</td>
<td>0</td>
</tr>
<tr>
<td>Copper</td>
<td>0.0268</td>
<td>0.0244</td>
<td>1.43</td>
<td>1.43</td>
<td>0</td>
</tr>
</tbody>
</table>

* WQBEL=water quality based effluent limit.
** See Derivation and Discussion of Limits, Section 10.
*** Value is in the current permit, rather than the expired permit. AWL = average weekly limit.

Note 1—Except for TSS and BOD, the proposed effluent limits that were provided by applicant were determined by using the ratio of current flow (6.4 MGD) to proposed design flow or 0.9; thus 90% of the current limit is applied as the proposed limit.

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

**Example:** 8.34 (lbs/MG)/(mg/L) * 1 mg/L * 5.25 MGD = 43.8 lbs/day

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

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

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

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(2) Continuing Authorities and 10 CSR 20-6.010(4)(A)5.B., consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.
9. If the proposed treatment technology is not covered in 10 CSR 20-8 Design Guides, the treatment process may be considered a new technology. As a new technology, the permittee will need to work with the review engineer to ensure equipment is sized properly. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation. This Antidegradation Review is based on the information provided by the facility and is not a comprehensive review of the proposed treatment technology. If the review engineer determines the proposed technology will not consistently meet proposed effluent limits, the permittee will be required to revise their Antidegradation Report.

7. **MIXING CONSIDERATIONS**

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

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

8. **PERMIT LIMITS AND MONITORING INFORMATION**

   | WASTLOAD ALLOCATION STUDY CONDUCTED (Y or N): | N |
   | USE ATTAINABILITY ANALYSIS CONDUCTED (Y or N): | N |
   | WHOLE BODY CONTACT USE RETAINED (Y or N): | Y |

   **OUTFALL #001**

   | WET TEST (Y or N): | N |
   | FREQUENCY: | | AEC: | METHOD: | MULTIPLE |

   **TABLE 3. EFFLUENT LIMITS FOR OUTFALL #001**
**Phase 3 Expansion**  
Permit No. CP0002184  
Wentzville WRC, MO - 0093599  
Page 18

### Monitoring Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Daily Maximum</th>
<th>Weekly Average</th>
<th>Monthly Average</th>
<th>Basis for Limit (Note 2)</th>
<th>Monitoring Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>MGD</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>FSR</td>
<td>ONCE/WEEDAY</td>
</tr>
<tr>
<td>BOD$_5$***</td>
<td>mg/L</td>
<td>27</td>
<td>18</td>
<td>NDEL</td>
<td>ONCE/MONTH</td>
<td></td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td>41</td>
<td>27</td>
<td>NDEL</td>
<td>ONCE/MONTH</td>
<td></td>
</tr>
<tr>
<td>PH</td>
<td>SU</td>
<td>6.5 – 9.0</td>
<td>6.5 – 9.0</td>
<td>FSR</td>
<td>ONCE/MONTH</td>
<td></td>
</tr>
<tr>
<td>Ammonia as N (April 1 – Sept 30)</td>
<td>mg/L</td>
<td>5.5</td>
<td>1.1</td>
<td>NDEL</td>
<td>ONCE/MONTH</td>
<td></td>
</tr>
<tr>
<td>Ammonia as N (Oct 1 – Mar 31)</td>
<td>mg/L</td>
<td>10</td>
<td>2.5</td>
<td>NDEL</td>
<td>ONCE/MONTH</td>
<td></td>
</tr>
<tr>
<td>Escherichia coli (E. coli)</td>
<td>Note 1</td>
<td>1030**</td>
<td>206**</td>
<td>FSR</td>
<td>ONCE/WEEK</td>
<td></td>
</tr>
<tr>
<td>Copper, Total Recoverable</td>
<td>µg/L</td>
<td>24.4</td>
<td>12.2</td>
<td>NDEL</td>
<td>ONCE/QUARTER</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

- **Note 1 – Colonies/100 mL**
- **Note 2 – Water Quality-Based Effluent Limitation – WQBEL; or Minimally Degradating 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$_5$ and TSS. Influent BOD$_5$ and TSS data should be reported to ensure removal efficiency requirements are met.**

### 9. Receiving Water Monitoring Requirements

No receiving water monitoring requirements recommended at this time.

### 10. Derivation and Discussion of Limits

Wasteload allocations and limits were calculated using two methods:

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

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{Qe + Qs}$$

(EPA/505/2-90-001, Section 4.5.5)

Where:
- $C = \text{downstream concentration}$
- $Cs = \text{upstream concentration}$
- $Qs = \text{upstream flow}$
- $Ce = \text{effluent concentration}$
- $Qe = \text{effluent flow}$

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).

Chronic wasteload allocations (WLAc) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and upstream stream flow without mixing considerations. Acute wasteload allocations are only determined in the absence of applicable chronic criteria.
10.1. OUTFALL #001 – MAIN FACILITY OUTFALL

10.2. LIMIT DERIVATION

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

- **Biochemical Oxygen Demand (BOD\textsubscript{5}).** BOD\textsubscript{5} limits of 18 mg/L monthly average, 27 mg/L average weekly. The technology-based secondary limitations at 10 CSR 20-7.015 (8) of 30 mg/L monthly and 45 mg/L average weekly are less protective of water quality standards than the no degradation expansion limitations in the table below. The table below shows that the expanded loading will be reduced as compared to the current permitted loading. This demonstration of insignificance satisfies the requirements of the AIP. These limitations are non-degrading and protective of existing water quality.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
<th>WLA (mg/L)</th>
<th>Current Q\textsubscript{d} (MGD)</th>
<th>Current Load (lbs/day)</th>
<th>Expanded Q\textsubscript{d} (MGD)</th>
<th>Expansion limit (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD\textsubscript{5}</td>
<td>Monthly</td>
<td>20</td>
<td>6.4</td>
<td>1067.5</td>
<td>7.04</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Weekly</td>
<td>30</td>
<td>6.4</td>
<td>1601.3</td>
<td>7.04</td>
<td>27</td>
</tr>
</tbody>
</table>

The applicant submitted a DO model that was revised by WPP staff. Staff used site-specific DO as input to the Streeter Phelps model. Staff also used 1 mg/L as DO in the effluent. For that reason, a dissolved oxygen limitation for the effluent will not be imposed.

Using the weekly expansion limitation stated above, modeling in Appendix B demonstrated that BOD\textsubscript{5} effluent is protective of water quality standards for DO. Streeter Phelps modeling indicated a dissolved oxygen of 5.02 mg/L for the facility, which was the lowest DO concentration resulting from BOD decay (see Appendix B). There is a demonstrated reduction in loading in the above table; therefore, no analysis is needed to show that the proposed expanded loading is insignificant because existing water quality should improve with the proposed discharge. Therefore, staff considers the effluent limitations of 27 mg/L as the average weekly and 18 mg/L as the monthly average protective of aquatic life.

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

- **Total Suspended Solids (TSS).** 41 mg/L monthly average, 27 mg/L average weekly limit. The technology-based secondary limitations at 10 CSR 20-7.015 (8) of 30 mg/L monthly and 45 mg/L average weekly are less protective of water quality standards than the no degradation expansion limitations in the table below. Therefore, the no degradation limitations must be applied.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
<th>WLA (mg/L)</th>
<th>Current Q\textsubscript{d} (MGD)</th>
<th>Current Load (lbs/day)</th>
<th>Expanded Q\textsubscript{d} (MGD)</th>
<th>Expansion limit (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>Monthly</td>
<td>30</td>
<td>6.4</td>
<td>1601.3</td>
<td>7.04</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Weekly</td>
<td>45</td>
<td>6.4</td>
<td>2401.9</td>
<td>7.04</td>
<td>41</td>
</tr>
</tbody>
</table>

Influent monitoring may be required for this facility in its Missouri State Operating Permit.
**pH.** – 6.5-9.0 SU. Technology based effluent limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. No mixing zone is allowed due to the classification of the receiving stream, therefore the water quality standard must be met at the outfall.

**Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B). & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

### No degradation Limitation Calculations

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
<th>WLA (mg/L)</th>
<th>Current Qd (MGD)</th>
<th>Current Load (lbs/day)</th>
<th>Expanded Qd (MGD)</th>
<th>Expansion limit (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia Summer</td>
<td>Monthly</td>
<td>1.2</td>
<td>6.4</td>
<td>64.1</td>
<td>7.04</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>6</td>
<td>6.4</td>
<td>320.3</td>
<td>7.04</td>
<td>5.5</td>
</tr>
<tr>
<td>Ammonia Winter</td>
<td>Monthly</td>
<td>2.7</td>
<td>6.4</td>
<td>144.1</td>
<td>7.04</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>11</td>
<td>6.4</td>
<td>587.1</td>
<td>7.04</td>
<td>10</td>
</tr>
</tbody>
</table>

No Degradation Expansion Limitations

<table>
<thead>
<tr>
<th>Season</th>
<th>Maximum Daily Limit (mg/l)</th>
<th>Average Monthly Limit (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>5.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Winter</td>
<td>10</td>
<td>2.5</td>
</tr>
</tbody>
</table>

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

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

*Rule for monitoring requirements is 10 CSR 20-7.015 (9)(D)6.A, B and C For facilities greater than 100,000 gpd: At a minimum, weekly monitoring is required during the recreational season (April 1 – October 31), with compliance to be determined by calculating the geometric mean of all samples collected during the reporting period (samples collected during the calendar week for the weekly average, and samples collected during the calendar month for the monthly average). The weekly average requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Please see GENERAL ASSUMPTIONS OF THE WQAR #7.*

Weekly monitoring is required at all times with compliance to be determined by *E. coli* water quality standards established in section (5)(C.) of 10 CSR 7.031 and the effluent rule short time limits in 7.015 (9)(B)1.E. Please see GENERAL ASSUMPTIONS OF THE WQAR #7.

**Hardness Dependent Metals:**

Eflluent 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.
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 absorbed 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 metals, dissolved metals, hardness, and total suspended solids are provided to the Department, partitioning evaluations may be considered and site-specific translators developed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
<th>WLA (µg/L)</th>
<th>Current Qd MGD</th>
<th>Current Load (lbs/day)</th>
<th>Expanded Qd MGD</th>
<th>Expansion limit (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>Monthly</td>
<td>13.4</td>
<td>6.4</td>
<td>0.715</td>
<td>7.04</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>26.8</td>
<td>6.4</td>
<td>1.43</td>
<td>7.04</td>
<td>24.4</td>
</tr>
</tbody>
</table>

Note: Future reasonable potential analysis should use the above limitation as comparison to the receiving water concentration rather than water quality standards. This process prevents further degradation of a Tier 2 water body.

- **Copper (Total Recoverable)** Protection of Aquatic Life Acute Criteria = 24.4 µg/L, Chronic Criteria = 12.2 µg/L. The hardness value of 200 mg/L represents the 50th percentile (median) for McCoy Creek. In the above table, the non-degrading effluent limitation for the expanded design flow for copper is shown.

11. **Antidegradation Review Preliminary Determination**

The proposed facility discharge will result in no degradation of the segment identified in the McCoy Creek. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. The Department has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewer: Steven Hamm, P.E.
Date: December 14, 2020
Unit Chief: John Rustige, P.E.
Appendix A: Map of Discharge Location
## Appendix B: Dissolved Oxygen Modeling using Streeter Phelps

### Part 1: Analysis Documentation
- **Permit Applicant:** City of Wentzville
- **Analysis Date:** 6/1/2018
- **Permit Number:** MO-0093599
- **Analysis Performed By:** HDR Engineering, Inc.

### Part 2: Facility Discharge Information
- **County:** St. Charles
- **Latitude:** 
- **Longitude:** 

#### Effluent Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unit</th>
<th>Value</th>
<th>Suggested Value &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>MGD</td>
<td>7.04</td>
<td>Facility Design Average Flow</td>
</tr>
<tr>
<td>CBOD5</td>
<td>[mg/L]</td>
<td>25</td>
<td>Adjust to meet D.O. criteria</td>
</tr>
<tr>
<td>NH3-N</td>
<td>[mg/L]</td>
<td>1.4</td>
<td>Equal to or less than toxicity-based ammonia WLA, Adjust to meet D.O.</td>
</tr>
<tr>
<td>TSS</td>
<td>[mg/L]</td>
<td>20</td>
<td>Adjust to meet D.O. criteria</td>
</tr>
<tr>
<td>D.O.</td>
<td>[mg/L]</td>
<td>6</td>
<td>Adjust to meet D.O. criteria</td>
</tr>
<tr>
<td>pH</td>
<td>S.U.</td>
<td>7.8</td>
<td>Use median from DMFR data if available, otherwise assume 7.8 S.U.</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>26</td>
<td>Default - 25°C for summer allocations, 9°C winter allocations</td>
</tr>
</tbody>
</table>

### Part 3: Receiving Stream Information
- **Name:** McCoy Creek
- **WBID:** 214
- **Class:** C
- **Watershed Area (mi²):** 26
- **Type:** Rifle-Pool
- **Aquatic Life Use Designation:** GWWF

#### Upstream Conditions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unit</th>
<th>Value</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streamflow</td>
<td>ft³/sec</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>CBOD5</td>
<td>[mg/L]</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>NH3-N</td>
<td>[mg/L]</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>VSS</td>
<td>[mg/L]</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>D.O.</td>
<td>[mg/L]</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>pH</td>
<td>S.U.</td>
<td>7.8</td>
<td>7.8</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>26</td>
<td>26°C</td>
</tr>
</tbody>
</table>

#### Water Quality Criteria of Receiving Stream

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Unit</th>
<th>Value</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.O.</td>
<td>[mg/L]</td>
<td>5.0</td>
<td>Chronic</td>
</tr>
<tr>
<td>NH3-N</td>
<td>[mg/L]</td>
<td>1.5</td>
<td>Chronic - E.P.</td>
</tr>
<tr>
<td>NH4-N</td>
<td>[mg/L]</td>
<td>12.1</td>
<td>Acute</td>
</tr>
</tbody>
</table>

#### Mixing Zone and Critical Flows

<table>
<thead>
<tr>
<th>Flow</th>
<th>Unit</th>
<th>Value</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7Q10</td>
<td>ft³/sec</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>D.O. Mxg Zone</td>
<td>ft³/sec</td>
<td>0.00</td>
<td>26% Laststream Flow</td>
</tr>
</tbody>
</table>
### Part 4: Model Parameters and Rate Constants

#### Stoichiometry of Organic Matter

<table>
<thead>
<tr>
<th></th>
<th>gC</th>
<th>gN</th>
<th>gD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td></td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>Dry Weight -OM</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Global Rates

<table>
<thead>
<tr>
<th>Rate</th>
<th>Unit</th>
<th>Value at 20°C</th>
<th>Value at Simulated Temperature</th>
<th>Theta</th>
<th>Uncalibrated Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBOD/CBO, CBO</td>
<td>mg/L mg/d</td>
<td>1.5</td>
<td></td>
<td></td>
<td>2.8</td>
<td>Varies between 1.6 to 4.5</td>
</tr>
<tr>
<td>Effluent VSS:TSS</td>
<td>mg VSS/mg TSS</td>
<td>0.85</td>
<td></td>
<td></td>
<td>0.85</td>
<td>Generally greater than 70%</td>
</tr>
<tr>
<td>CBOD Oxidation</td>
<td>day⁻¹</td>
<td>0.56</td>
<td>0.72</td>
<td>1.05</td>
<td>0.53</td>
<td>Varies between 0.7 to 0.85</td>
</tr>
<tr>
<td>NBOD Oxidation</td>
<td>day⁻¹</td>
<td>0.3</td>
<td>0.48</td>
<td>1.08</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>SOD</td>
<td>gO₂ m⁻³ day⁻¹</td>
<td>0.2</td>
<td>0.3</td>
<td>1.07</td>
<td>4.9</td>
<td>Varies between 0.2 and 0.49</td>
</tr>
<tr>
<td>SOD Coverage</td>
<td>%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resorption Rate</td>
<td>day⁻¹</td>
<td>7.6</td>
<td>8.8</td>
<td>1.02</td>
<td>7.6</td>
<td>See Metcalf and Florence (1999)</td>
</tr>
</tbody>
</table>

#### Mass Balance at Point of Mixing

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streamflow</td>
<td>ft² sec⁻¹</td>
<td>10.91</td>
</tr>
<tr>
<td>CBOD₃</td>
<td>mg/L</td>
<td>25.0</td>
</tr>
<tr>
<td>CBOG</td>
<td>mg/L</td>
<td>37.9</td>
</tr>
<tr>
<td>NH₄-N</td>
<td>mg/L</td>
<td>1.4</td>
</tr>
<tr>
<td>VSS (Deflalts)</td>
<td>mg/L</td>
<td>17.0</td>
</tr>
<tr>
<td>D.O.</td>
<td>mg/L</td>
<td>6.0</td>
</tr>
<tr>
<td>D.O. Saturation</td>
<td>mg/L</td>
<td>7.0</td>
</tr>
<tr>
<td>D.O. Deficit</td>
<td>mg/L</td>
<td>1.88</td>
</tr>
<tr>
<td>pH</td>
<td>S.U.</td>
<td>7.8</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>28.0</td>
</tr>
</tbody>
</table>

**RUN Streeter-Phelps**

**Minimum D.O. (mg/L):** 5.8
Appendix C: Antidegradation Review Summary Attachments

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

1) Attachment A: Antidegradation Application.
### 1. FACILITY

<table>
<thead>
<tr>
<th>NAME</th>
<th>TELEPHONE NUMBER WITH AREA CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wentzville Water Reclamation Center</td>
<td>(636) 635-2071</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (PHYSICAL)</th>
<th>CITY</th>
<th>STATE</th>
<th>ZIP CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2455 Mette Road</td>
<td>Wentzville</td>
<td>MO</td>
<td>63355</td>
</tr>
</tbody>
</table>

### 2. OWNER

<table>
<thead>
<tr>
<th>NAME AND OFFICIAL TITLES</th>
<th>ADDRESS</th>
<th>CITY</th>
<th>STATE</th>
<th>ZIP CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susan Spiegel - Director of Public Works</td>
<td>1001 Schroder Creek Blvd</td>
<td>Wentzville</td>
<td>MO</td>
<td>63355</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TELEPHONE NUMBER WITH AREA CODE</th>
<th>E-MAIL ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(636) 639-2048</td>
<td><a href="mailto:susan.spiegel@wentzvillemo.org">susan.spiegel@wentzvillemo.org</a></td>
</tr>
</tbody>
</table>

### 3. CONTINUING AUTHORITY

The regulatory requirement regarding continuing authority is found in 10 CSR 206.010(3) available at [www.sos.mo.gov/adrules/csr/current/10csr/10c206-01.pdf](http://www.sos.mo.gov/adrules/csr/current/10csr/10c206-01.pdf).

<table>
<thead>
<tr>
<th>NAME AND OFFICIAL TITLES</th>
<th>ADDRESS</th>
<th>CITY</th>
<th>STATE</th>
<th>ZIP CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>same as owner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TELEPHONE NUMBER WITH AREA CODE</th>
<th>E-MAIL ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4. RECEIVING WATER BODY SEGMENT #1

Name: McCoy Creek

<table>
<thead>
<tr>
<th>UPPER END OF SEGMENT (Location of discharge)</th>
<th>LOWER END OF SEGMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTM 684925, 4303837</td>
<td>UTM 687923, 4304448</td>
</tr>
<tr>
<td>Lat 49.9448, Long -94.6102</td>
<td>Lat 49.9550, Long -94.6050</td>
</tr>
</tbody>
</table>

Per the Missouri Antidegradation Implementation Procedure, or AIP, the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."  

### 5. WATER BODY SEGMENT #2 (IF APPLICABLE, Use another form if a third segment is needed)

<table>
<thead>
<tr>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UPPER END OF SEGMENT</th>
<th>LOWER END OF SEGMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTM</td>
<td>UTM</td>
</tr>
<tr>
<td>Lat, Long</td>
<td>Lat, Long</td>
</tr>
</tbody>
</table>

### 6. WET WEATHER ANTICIPATIONS

If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(n)(4). Attach the feasibility analysis to the antidegradation review report.

What is the Wet Weather Flow Peaking Factor in relation to design flow? 3:1

Wet Weather Design Summary:
The Phase III improvements includes only the construction of an additional aeration basin at the City's WRC. The existing UV facility will continue to disinfect the full wet weather flows anticipated for this improvement phase.
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 (QAP) (2) collecting water quality data approved by the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPF is submitted to the department for approval and review. 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 EQO 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 QAPF, project sampling plan, and data collected for all appropriate POCs.

Comments/Discussion: A DO model was developed and submitted in accordance with MDNR guidance.

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).

<table>
<thead>
<tr>
<th>Pollutants of Concern</th>
<th>Units</th>
<th>Maximum Daily Limit</th>
<th>Average Weekly Limit</th>
<th>Average Monthly Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD5</td>
<td>MGL</td>
<td>3.6 mg/L</td>
<td>---</td>
<td>1.4 mg/L</td>
</tr>
<tr>
<td>TSS</td>
<td>MGL</td>
<td>7.5 mg/L</td>
<td>---</td>
<td>2.3 mg/L</td>
</tr>
<tr>
<td>DISSOLVED OXYGEN</td>
<td>MGL</td>
<td>10 mg/L</td>
<td>---</td>
<td>20 mg/L</td>
</tr>
<tr>
<td>AMMONIA</td>
<td>MGL</td>
<td>22.0 ug/L</td>
<td>---</td>
<td>11.0 ug/L</td>
</tr>
<tr>
<td>BACTERIA (E. COLI)</td>
<td>CFUS</td>
<td>15 mg/L</td>
<td>---</td>
<td>10 mg/L</td>
</tr>
</tbody>
</table>

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 3.B.1. Per 10 CSR 20.6.010(c)(3)(b), 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 Fact Sheet that can be found at: http://dnr.mo.gov/pub/squ2453.pdf

Non-degrading alternatives: The City evaluated effluent irrigation as an alternative to the discharge. However, this alternative is not practicable given the amount of land area needed. It was therefore excluded from further evaluation.

Alternatives ranging from less-degrading to degrading including Preferred Alternative (All treatment levels for POCs must at a minimum meet water quality standards):

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>POC</th>
<th>Activated Sludge Base Case Average Monthly Limit</th>
<th>Immediate Biological Nutrient Removal Average Monthly Limit</th>
<th>Enhanced Nutrient Removal Average Monthly Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia, Summer</td>
<td>1.4 mg/L</td>
<td>1.4 mg/L</td>
<td>1.4 mg/L</td>
<td></td>
</tr>
<tr>
<td>Ammonia, Winter</td>
<td>2.9 mg/L</td>
<td>2.9 mg/L</td>
<td>2.9 mg/L</td>
<td></td>
</tr>
<tr>
<td>BOD</td>
<td>20 mg/L</td>
<td>10 mg/L</td>
<td>10 mg/L</td>
<td></td>
</tr>
<tr>
<td>TSS</td>
<td>20 mg/L</td>
<td>10 mg/L</td>
<td>10 mg/L</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>11.0 ug/L</td>
<td>11.0 ug/L</td>
<td>11.0 ug/L</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>6.5 - 9.0 SU</td>
<td>6.5 - 9.0 SU</td>
<td>6.5 - 9.0 SU</td>
<td></td>
</tr>
<tr>
<td>Oil and Grease</td>
<td>10 mg/L</td>
<td>10 mg/L</td>
<td>10 mg/L</td>
<td></td>
</tr>
<tr>
<td>Bacteria</td>
<td>206 cfu/100 ml</td>
<td>206 cfu/100 ml</td>
<td>206 cfu/100 ml</td>
<td></td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>---</td>
<td>1.0 mg/L - annual average</td>
<td>0.5 mg/L - annual average</td>
<td></td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>---</td>
<td>10.0 mg/L - annual average</td>
<td>1.0 mg/L - annual average</td>
<td></td>
</tr>
</tbody>
</table>
### 10. DETERMINATION OF THE REASONABLE ALTERNATIVE

**Per** the Antidegradation Implementation Procedure Section II.B.2.a, "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.

The City evaluated four alternatives for this antidegradation analysis. The base case alternative includes improvements and an expansion to the City's existing treatment facility. The base case alternative would expand DAF from 5.3 MGD to 7.04 MGD and includes future plans for improvements towards attaining biological nutrient removal over the next 20 years.

The alternatives to the base case included a non-degrading option (efficient irrigation) and two less-degrading options (immediate biological nutrient removal and enhanced nutrient removal). The non-degrading option was not practicable due to the land area required. The less-degrading options were considered practicable.

#### 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 present worth cost of the base case alternative is $10.1 million. Based on the 120% threshold described in the AIP, alternatives that cost more than $12.2 million are not economically efficient. The estimated present worth cost of the less-degrading BNRI ($19.2 million) and BNH ($81.0 million) alternatives significantly exceed this threshold. Therefore, they were excluded from further analysis.

#### 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."

The base case alternative was assumed to be affordable.

#### Preferred Chosen Alternative:

The base case alternative consists of the initial phase of the City's multi-phased approach to implement biological nutrient removal (BNR) technology over the next 20 years as capacity demands increase. These phases follow from the initial two expansion and upgrade phases described in Section 1.2 of the report, and are therefore referred to as Phase III, IV, V, and VI. This antidegradation review is specifically for the Phase III expansion to 7.04 MGD. See the report for an explanation of all phases. Specifically, Phase III consists of the following: installation of Aeration Basin 5 anoxic zone mixers, a new Aeration Basin 6 to contain anoxic and aerobic zones, and conversion of Treatment Unit 2 to entirely aerobic digestion.

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

Not economically efficient. See above.

#### Comments/Discussion:
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 with the Antidegradation Implementation Procedure Section I.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 I.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 for this project are the residents and customers of the City of Wentzville.

**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 I.E.1, but specific community examples are encouraged.

The City has experienced dramatic population growth since 2000 and expects this growth to continue into the foreseeable future. The City anticipates that the population equivalent will grow by 112% between 2017 and 2037. At this rate of growth, the projected annual day flow increase is 222,800 gpd. These results suggest that additional capacity may be needed at the WRC as soon as 2020.

**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 I.E.1.

The proposed expansion project is needed to allow for continued growth in the City.

**PROPOSED PROJECT SUMMARY:**

The City is evaluating potential alternatives for upgrading and expanding their Water Reclamation Center (WRC, MO-009359) to address recent and anticipated growth in the area. The City's current permitted flow of 4.4 million gallons per day (MGD) is based on a minimum monthly flow, with the RCR's current maximum month average day flow equal to 2.7 MGD. The WRC discharges to the Creek C section of McCoy Creek approximately 1.2 miles upstream from the Big Creek confluence. McCoy Creek is currently considered a Tier 2 redevelopment for antidegradation review purposes.

Based on current population growth projections, the City anticipates expanding to a design average flow of 6.88 MGD by the year 2025. This report documents the results of the City's antidegradation review for the initial expansion phase from the existing permitted flow of 4.4 MGD to 7.34 MGD.

The City conducted an extensive analysis and socioeconomic review to determine that the increased discharge is necessary and important. The alternative analysis included an evaluation of the base-case alternative (Phase III expansion), a non-expanding alternative (new application), and two tier II alternatives (new and existing). Results of the alternative analysis indicated that the base-case alternative will meet all existing regulatory requirements and is the only practicable, environmentally efficient, and affordable treatment alternative. Therefore, it is the preferred alternative for the purposes of this review. Furthermore, the socioeconomic review demonstrated that the expansion project is necessary to accommodate existing and anticipated population growth in the City.

**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**

Jeffrey Grater, PE / MO 1999137696

**DATE**

7/3/2018

---

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

**SIGNATURE**

DATE

7/6/18

---

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

**SIGNATURE**

DATE

7/6/18

---
APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Treatment Facility form has been developed in a modular format and consists of Part A and B. All applicants must complete Part A. Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.

PART A – BASIC INFORMATION

1.0 APPLICATION INFORMATION  (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

1.1 Is this a Federally funded project?  □ YES  □ N/A  Funding Agency:  Project #:  

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?

□ YES  Date of Approval:  12/2018  □ N/A

1.3 Has the department approved the proposed project's facility plan?  

□ YES  Date of Approval:  1/2019  □ NO  (If No, complete No. 1.4.)

1.4 (Complete only if answered No on No. 1.3.) Is a copy of the facility plan* for wastewater treatment facilities included with this application?

□ YES  □ NO  □ Exempt because  

1.5 Is a copy of the appropriate plans* and specifications* included with this application?

□ YES  Denote which form is submitted:  □ Hard copy  □ Electronic copy (See Instructions.)  □ NO

1.6 Is a summary of design* included with this application?  □ YES  □ NO  See Facility Plan

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?

□ YES  Date of submittal:  

□ Enclosed is the appropriate operating permit application and fee submittal. Denote which form:  □ A  □ B  □ B2

□ N/A: However, the department believes that my operating permit requires revision to permit limitation such as changing equivalent to secondary limits to secondary limits or adding total residual chlorine limits, please share a draft copy prior to public notice?  □ YES  □ NO

1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency?  □ YES  □ NO

1.9 Is the appropriate fee or JetPay confirmation included with this application?  □ YES  □ NO  See Section 7.0

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

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT  Wentzville WRC Phase 3 Expansion

2.2 ESTIMATED PROJECT CONSTRUCTION COST  $ 6,146,000

2.3 PROJECT DESCRIPTION

Expansion of the plant ADF Design Capacity from 5.3 MGD to 7.0 MGD via the construction of a new Aeration Basin, Conversion of a Treatment Unit to entirely Aerobic Digestion and modifications to Influent Flow Splitter Structure.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge is dewatered and stored in a cake storage building and land applied or hauled to landfill.

2.5 DESIGN INFORMATION

A. Current population: 38k  ;  Design population: 47.8k

B. Actual Flow: 4.3M gpd;  Design Average Flow: 5.3 M gpd;  Actual Peak Daily Flow: 13.9M gpd;  Design Maximum Daily Flow: 13.9M gpd;  Design Wet Weather Event:  

2.6 ADDITIONAL INFORMATION

A. Is a topographic map attached?  □ YES  □ NO

B. Is a process flow diagram attached?  □ YES  □ NO
3.0 WASTEWATER TREATMENT FACILITY

NAME: Wentzville Water Reclamation Center
ADDRESS (PHYSICAL): 2455 Marte Rd
CITY: Wentzville
STATE: MO
ZIP CODE: 63385
COUNTY: St Charles

Wastewater Treatment Facility: Mo 0093599 (OuFall #003 Of )

3.1 Legal Description: SW ¼, SE ¼, NE ¼, Sec. 2, T 47N, R 1E

3.2 UTM Coordinates: Easting (X): 684740 Northing (Y): 4303618
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: McCoy Creek (C)

4.0 PROJECT OWNER

NAME: City of Wentzville
ADDRESS: 1001 Schroeder Creek Boulevard
CITY: Wentzville
STATE: MO
ZIP CODE: 63385

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

NAME: City of Wentzville/Susan Spiegel
ADDRESS: 1001 Schroeder Creek Boulevard
CITY: Wentzville
STATE: MO
ZIP CODE: 63385

5.1 A letter from the continuing authority, if different than the owner, is included with this application. ✔ YES ☐ NO ☑ N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application? ☑ YES ☐ NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants included with this application? ☑ YES ☐ NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? ☑ YES ☐ NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? ☑ YES ☐ NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☑ YES ☐ NO

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME: David Bunch / HDR Inc.
ADDRESS: 10450 Holmes Rd., #600
CITY: Kansas City
STATE: MO
ZIP CODE: 64131

7.0 APPLICATION FEE

☐ CHECK NUMBER
☐ JETPAY CONFIRMATION NUMBER

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

PROJECT OWNER SIGNATURE: Susan Spiegel

DATE: 7/22/2020

Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
P.O BOX 176
JEFFERSON CITY, MO 65102-0175

END OF PART A.

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.