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January 19, 2021

Mr. Joseph E. Batis, MAI, R/W-AC
Edward J. Batis & Associates
313 N. Chicago Street
Joliet, IL 60432

Re: Engineering Report
Water and Wastewater System Appraisal
Orrick, Missouri

Dear Mr. Batis:

Flinn Engineering, LLC is pleased to present the following information regarding the water and wastewater systems owned by the Town of Orrick, Missouri (Town) as part of the appraisal process you are completing for Missouri American Water. The purpose of this Engineering Report is to provide a high-level review of the condition of the system, estimate the 2021 installation cost, and estimate the depreciated book value of the assets based on 2021 installation costs and the age of the assets. The Town provided limited information on the assets. The original installation costs and installation dates were not documented by the Town. The 2021 estimated cost of installation was calculated using a combination of an engineering opinion of cost to install the assets based on knowledge of other systems of similar size, as well as correspondence from the Town, vendors, and contractors. Some of the original installation costs were available. The average annual inflation rate was downloaded from the US Department of Labor – Bureau of Labor Statistics (**Attachment A**). The estimated original installation cost was inflated to 2021 using the average annual inflation rate. The 2021 estimated installation cost was depreciated based on the estimated age of each asset. Based on the "Census of Missouri Public Water Systems 2020" (excerpt in **Appendix B**) from the Missouri Department of Natural Resources, the Orrick system was placed in service in 1955.

A site visit was conducted on January 12, 2021. The above ground assets were observed to determine a high-level condition for this report. No additional testing was conducted beyond the visual observation of condition.

The water system includes a meter vault, an elevated storage tank, and the water distribution system. The wastewater system includes a treatment plant, five (5) lift stations, and the sewer collection system. The Town began purchasing water from Ray County PWSD #2 in 2000. The wells that previously provided water for the Town have been reportedly abandoned. The well sites were not visited as part of this report.

**Meter Vault**

The Town installed a below ground meter vault in 2000 to meter the purchased water. The meter vault was fabricated by Engineered Fluids, Inc. (EFI). The sales team at EFI was contacted and was able to provide the original cost of the meter vault ($23,000) and the telemetry between the

meter vault and the elevated tank ($16,000). Assuming the installation for the meter vault was twice the cost of material ($46,000) and the telemetry was half of the material ($8,000), the total 2000 cost of the meter vault and telemetry was $103,000. The average annual inflation factor for 2000 (**Appendix A**) was used to inflate the estimated 2000 installation cost to 2021 dollars. The estimated 2021 installation cost is $155,700. The meter vault is in very good condition.

**Water Storage Tank**

The water system includes a 150,000-gallon elevated tank. The tank is a welded steel, multi-leg tank. The Town did not provide documentation on the tank. The information was provided by Town staff during the site visit. Based on conversations with tank manufacturers, the estimated cost for supplying and constructing a storage tank in 2021 would be in the range of $2.00 to $2.50 per gallon depending on the height of the tank. We estimated the cost of the tank to be $2.50 per gallon because of the height. We estimated the cost of the foundation to be 10% of the tank cost, the site piping to be 5% of the tank cost, and the site work (grading, fencing, etc) to be $5,000. The engineering is estimated at 10% of the subtotal for the tank, foundation, etc. **Table 1** summarizes the estimated cost to install the tank in 2021.

Table 1 – Tank Estimated Installation Cost in 2021

| Description of Work | Elevated Tank (150,000 gallons) |
|---|---|
| Tank ($2.50 per gallon) | $ 375,000.00 |
| Foundation (10% of Tank) | $ 37,500.00 |
| Site Piping (5% of Tank) | $ 18,750.00 |
| Site Work (Lump sum $5,000) | $ 5,000.00 |
| Subtotal | $ 436,250.00 |
| Engineering (10% of Subtotal) | $ 43,625.00 |
| Total | $ 479,875.00 |

The tank was inspected after the tornado hit the town in 2014. The tank was reportedly painted in 2015. The 2015 project included replacing some screening. The tank appears to be in very good condition.

**Water Distribution System**

The Town did not provide documentation on the distribution system. A report was completed by Ponzer-Youngquist, P.A., Inc. in 2015 to analyze the existing water distribution system and review damage from the 2014 tornado (2015 Water System Study). The 2015 Water System Study includes an inventory of the water distribution system. **Table 2** shows the inventory from the 2015 Water System Study.

Table 2 – Water Distribution System Inventory

| Pipe Diameter and Material | Length (feet) |
|---|---|
| 1-inch (asbestos cement) | 1,082 |
| 2-inch (asbestos cement) | 1,351 |
| 3-inch (asbestos cement) | 860 |
| 4-inch (asbestos cement) | 16,085 |
| 6-inch (asbestos cement) | 17,547 |
| 8-inch (PVC) | 2,318 |
| Total | 39,243 |

The original system was installed in 1955 based on the "Census of Missouri Public Water Systems 2020" (excerpt in **Appendix B**). We assumed all the 8-inch PVC was installed in 2000 with the new mater vault and the elevated tank. **Table 3** summarizes the estimated 2021 cost of the water distribution system. The estimated cost assumes the average depth of the water main is approximately 3 feet deep. The estimate includes design, excavation, materials, installation, backfill, and restoration. The number of fire hydrants was estimated based on the size of the town. The number of services and meters is based on the "Census of Missouri Public Water Systems 2020" (excerpt in **Appendix B**).

Table 3 – Distribution System Estimated Installation Cost in 2021

| Asset Description | Quantity | Unit | Estimated Unit Cost 2021 | 2021 Estimated Installation Cost |
|---|---|---|---|---|
| 1 to 3-inch Water Main | 3,293 | feet | $ 30.00 | $ 98,790 |
| 4-inch Wate Main | 16,085 | feet | $ 45.00 | $ 723,825 |
| 6-inch Water Main | 17,547 | feet | $ 50.00 | $ 877,350 |
| 8-inch Water Main | 2,318 | feet | $ 55.00 | $ 127,490 |
| Fire Hydrants | 40 | each | $3,500.00 | $ 140,000 |
| Services and Meters | 340 | each | $1,500.00 | $ 510,000 |
| | | | Total | $ 2,477,455 |

The water distribution system was not observed for condition. The non-revenue water (NRW) is reportedly 40%. The 2015 Water System Report shows NRW varying from approximately 27% in 2007 to 58.88% in 2015. Due to the sandy soil, water leaks are difficult to identify. Based on the age of the water distribution system and the high level of NRW, the water distribution system is in poor condition.

**Wastewater Treatment Plant**

The wastewater treatment plant is a two-cell lagoon system with an aeration basin. The design flow is 118,400 gallons per day, according to the MDNR Operating Permit (**Appendix C**). The Town did not provide documentation on the lagoons. The information was provided by Town staff during the site visit. There is no chemical feed at the lagoons and sludge is retained in the lagoon. The plant was originally constructed in 1959 according to Town staff.

The USEPA published a Technology Fact Sheet on lagoons (**Appendix D**). The Fact Sheet does not list typical installation costs because the costs vary significantly based on the cost of the land, excavation, grading, berm construction, inlet and outlet structures, and permeability of the soil. Based on some recent projects and discussions with contractors, we estimate the 2021 installation cost at $2.50 per gallon treated ($155,000).

The two (2) aerators were replaced in 2020. According to Town staff, the aerators were $2,500 each and cost approximately $1,000 to install.

The original cost of the treatment plant is fully depreciated. The 2015 Wastewater System Study outlines several deficiencies in the treatment process including exceeding average $BOD_5$ and TSS, as well as the aeration basin being severely undersized. The sludge was removed from the

lagoons in 2011 which improved the operation. The new aerators in 2020 likely improved the operation, but documentation was not provided. It appears to be in good condition and can continue to be in service well beyond the depreciation period.

**Sewer Lift Stations**

The wastewater system includes five (5) sewer lift stations. A report was completed by Ponzer-Youngquist, P.A., Inc. in 2015 to analyze the existing wastewater system and review damage from the 2014 tornado (2015 Wastewater System Study). The 2015 Wastewater System Study included information on the lift stations.

Lift Station No. 1 was built in 1960 and rebuilt in 2008. After the 2014 tornado the electrical controls were replaced, the piping was cleaned/replaced, and a manual transfer switch/portable generator connection was added. Although the 2015 Wastewater System Study indicates that the station was rebuilt in 2008, it also states that the pumps are over 50 years old and in poor condition. So, it is assumed that the 2008 rebuild included minor improvements. The costs for the original installation, rebuild, and electrical improvements were not provided. The 2021 estimated cost for the original installation is $75,000. The 2021 estimated cost for the 2008 rebuild is $15,000. The 2021 estimated cost for the 2015 electrical improvements is $10,000. Lift Station No. 1 is in fair condition.

Lift Station No. 2 is similar in size to Lift Station No. 1. It was built in the late 1960's (assume 1969) and also included electrical improvements after the 2014 tornado. The 2021 estimated cost for the original installation is $75,000. The 2021 estimated cost for the 2015 electrical improvements is $10,000. Lift Station No. 2 is in fair condition.

Lift Station No. 3 was replaced in 2015 with a reported cost of $150,000. Inflating the 2015 replacement cost to 2021 is approximately $170,000. Lift Station No. 3 is in excellent condition.

Lift Station No. 4 was installed in the late 1960's (assume 1969). This station pumps all the wastewater from the town to the treatment plant. This station has larger pumps so the 2021 estimated cost for the original installation is $100,000. Although the 2015 Wastewater System Study indicates that the electrical controls were replaced as a result of the 2014 tornado, Town staff indicated during the site visit that this is the only station without new controls. A portable generator connection and transfer switch were added in 2015. The 2021 estimated cost for the generator connection and transfer switch is $10,000. Lift Station No. 4 is in fair condition.

Lift Station No. 5 was installed around 2005. The station was reportedly sized for a residential development that did not occur. The station currently serves about 4 houses. There are still some houses west of lift station that are on private septic systems. The 2021 estimated cost for the original installation is $75,000. The 2021 cost for the generator connection and transfer switch is $10,000. Lift Station No. 5 is in excellent condition.

Lift station equipment has a depreciation period of only 10 years. Most of the station assets are fully depreciated and are still in service. They could continue to remain in service well beyond the depreciation period if they are continually maintained.

**Sewer Collection System**

The Town did not provide documentation on the sewer collection system. The 2015 Wastewater System Study included some limited information on the collection system. **Appendix E** includes Figures 2 and 3 from the 2015 Wastewater System Study. The Figures in Appendix E have been corrected based on information obtained from Town staff during the site visit. The corrections are

listed in **Appendix E** and are summarized below.

- The 2015 Wastewater System Study indicates 24,000 feet of 8-inch vitrified clay pipe gravity sewer lines and five (5) sections of cast iron force main. The length of sewer is expected to be similar to the length of water main (39,243 feet). Figure 2 does not include the gravity sewer or manholes north of the railroad track going to Lift Station 1.
- The alignment shown from Lift Station 1 is not correct. The discharge from Lift Station 1 runs south and east through town to a manhole south of Lift Station 3. Then the run of gravity sewer continues south through three (3) more manholes through the field to Lift Station 4.
- Adding the missing gravity sewer and forcemain brings the total length of sewer to 41,535 feet, similar to the total length of water main (39,243 feet).

The length of force main and missing gravity sewer was estimated using Google Earth. **Table 4** summarizes the inventory of the sewer collection system and the estimated installation cost in 2021. The number of manholes was estimated and is described in **Appendix E**. The number of sewer laterals is assumed to be similar to the number of water meters.

Table 4 - Sewer Collection System Estimated Installation Cost in 2021

| Asset Description | Quantity | Unit | Estimated Unit Cost 2020 | 2021 Estimated Installation Cost |
|---|---|---|---|---|
| Gravity Sewer (8" VCP) | 34,200 | feet | $ 55.00 | $ 1,881,000 |
| Force Main (6" CI) | 7,335 | feet | $ 45.00 | $ 330,075 |
| Manholes | 79 | each | $ 3,500.00 | $ 276,500 |
| Service Laterals | 340 | each | $ 300.00 | $ 102,000 |
| | | | Total | $ 2,589,575 |

The 2021 cost to install the gravity sewer is estimated to be $55 per foot. The estimated cost assumes the average depth of the sewer is approximately 6 feet deep. The 2021 cost to install the forcemain is estimated to be $45 per foot. The estimated cost assumes the average depth of the sewer is approximately 3 feet deep. The cost to install manholes in 2021 is estimated to be $3,500 each. Service laterals are assumed to be 4-inch are estimated at $300 each. The estimate includes design, excavation, materials, installation, backfill, and restoration.

The sewer collection system was not observed for condition. The Town reported that a smoke test was recently conducted without finding any significant issues. Although the entire sewer collection system is completely depreciated, the system is still in use and could continue to be in use well beyond the depreciation period. Based on the age, material, and apparent lack of infiltration/inflow, the collection system is assumed to be in good condition.

**Estimated Book Value**

**Table 5** shows a summary of the estimated cost for installation in 2021 and the depreciated value based on the age of the assets. The depreciation calculation is included in **Appendix F**. The depreciation periods are based on depreciation periods used by the Missouri Public Service Commission (PSC) during recent rate cases. The depreciation schedules from six (6) recent rate cases are included in **Appendix G**. Three (3) are from water systems and three (3) are from wastewater systems. The depreciation periods used are summarized in **Table 6**.

Table 5 - Summary of Book Value

| | Estimated 2021 Installation Cost | Estimated Depreciated Book Value |
|---|---|---|
| Orrick Water System | $ 3,113,030.00 | $ 376,161.70 |
| Orrick Wastewater System | $ 3,442,575.00 | $ 90,300.00 |
| Total | $ 6,555,605.00 | $ 466,461.70 |

Table 6 – Depreciation Periods

| Asset | Depreciation Period (years) |
|---|---|
| Tanks | 42 |
| Water Main | 50 |
| Fire Hydrants | 50 |
| Services and Meters | 35 |
| WWTP-Lagoon | 40 |
| Lift Station | 10 |
| Sanitary Sewer, Manholes, Laterals | 50 |

Overall the water and wastewater systems appear to be in good condition and well-maintained. Although many of the assets are fully depreciated, they are still in operation and could continue to stay in operation well beyond the depreciation period.

Thank you for the opportunity to assist you on this project. Please let me know if you have any questions.

Sincerely,

Kelly A. Simpson

Kelly A. Simpson, PE, LEED® AP
Owner

Enclosures:
Appendix A – Average Annual Inflation Rates
Appendix B – MDNR Census of Water Utilities 2020
Appendix C – MDNR Operating Permit
Appendix D – USEPA Fact Sheet on Lagoons
Appendix E – Sewer Collection System – Corrections/Updates from Previous Study
Appendix F – Depreciation Calculation
Appendix G – Missouri PSC Depreciation Schedules

**CPI-All Urban Consumers (Current Series)**
**12-Month Percent Change**
US Department of Labor - Bureau of Labor Statistics
**Series Id:** CUUR0000SA0L1E
**Not Seasonally Adjusted**
**Series Title:** All items less food and energy in U.S. city
**Area:** U.S. city average
**Item:** All items less food and energy
**Base Period:** 1982-84=100
**Years:** 1958 to 2020

https://data.bls.gov/pdq/SurveyOutputServlet
Search for CUUR0000SA0L1E
More Formatting Options
12-month percent change

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual | HALF1 | HALF2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1958** | 3.2 | 3.2 | 2.8 | 2.4 | 2.4 | 2.1 | 2.4 | 2.1 | 1.7 | 1.7 | 1.7 | 1.7 | 2.4 | | |
| **1959** | 1.7 | 1.7 | 1.7 | 1.7 | 2.0 | 2.0 | 2.0 | 2.0 | 2.4 | 2.7 | 2.0 | 2.0 | 2.0 | | |
| **1960** | 2.0 | 2.3 | 2.0 | 2.0 | 1.7 | 1.7 | 1.3 | 1.3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.3 | | |
| **1961** | 1.0 | 0.7 | 0.7 | 1.0 | 1.0 | 1.0 | 1.3 | 1.3 | 1.6 | 1.3 | 1.3 | 1.3 | 1.3 | | |
| **1962** | 1.3 | 1.3 | 1.6 | 1.3 | 1.6 | 1.6 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | | |
| **1963** | 1.0 | 1.0 | 1.0 | 1.3 | 1.0 | 1.3 | 1.3 | 1.6 | 1.3 | 1.3 | 1.6 | 1.6 | 1.3 | | |
| **1964** | 1.9 | 1.9 | 1.9 | 1.6 | 1.6 | 1.6 | 1.6 | 0.9 | 1.3 | 1.3 | 1.2 | 1.2 | 1.6 | | |
| **1965** | 1.6 | 1.6 | 1.2 | 1.6 | 1.6 | 1.2 | 1.2 | 1.6 | 1.5 | 1.5 | 1.2 | 1.5 | 1.2 | | |
| **1966** | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 | 2.4 | 2.8 | 3.1 | 3.0 | 3.3 | 3.6 | 3.3 | 2.4 | | |
| **1967** | 3.6 | 3.6 | 3.6 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.6 | 3.5 | 3.5 | 3.8 | 3.6 | | |
| **1968** | 4.1 | 4.1 | 4.4 | 4.4 | 4.3 | 4.6 | 4.9 | 4.9 | 4.9 | 4.8 | 5.1 | 5.1 | 4.6 | | |
| **1969** | 5.1 | 5.3 | 5.6 | 6.1 | 6.1 | 5.8 | 5.8 | 5.8 | 6.0 | 6.0 | 5.9 | 6.2 | 5.8 | | |
| **1970** | 6.2 | 6.1 | 6.1 | 5.8 | 6.0 | 6.5 | 6.2 | 6.2 | 6.2 | 6.4 | 6.6 | 6.6 | 6.3 | | |
| **1971** | 6.3 | 5.8 | 5.2 | 5.0 | 5.2 | 4.9 | 4.9 | 4.6 | 4.4 | 3.8 | 3.3 | 3.1 | 4.7 | | |
| **1972** | 3.1 | 3.3 | 3.3 | 3.3 | 3.1 | 2.8 | 2.8 | 3.3 | 2.8 | 3.0 | 3.0 | 3.0 | 3.0 | | |
| **1973** | 2.8 | 2.8 | 3.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.8 | 4.3 | 4.5 | 4.7 | 3.6 | | |
| **1974** | 4.9 | 5.4 | 5.8 | 6.2 | 6.8 | 7.9 | 8.8 | 9.6 | 10.2 | 10.6 | 11.2 | 11.1 | 8.3 | | |
| **1975** | 11.5 | 11.7 | 11.4 | 11.3 | 10.5 | 9.6 | 9.1 | 8.2 | 7.7 | 7.0 | 6.8 | 6.7 | 9.1 | | |
| **1976** | 6.7 | 6.5 | 6.6 | 6.4 | 6.5 | 6.5 | 6.7 | 6.8 | 6.8 | 6.7 | 6.5 | 6.1 | 6.5 | | |
| **1977** | 6.3 | 6.3 | 6.2 | 6.3 | 6.3 | 6.6 | 6.3 | 6.2 | 6.2 | 6.0 | 5.9 | 6.5 | 6.3 | | |
| **1978** | 6.4 | 6.2 | 6.3 | 6.5 | 6.8 | 7.0 | 7.4 | 7.5 | 7.9 | 8.4 | 8.7 | 8.5 | 7.4 | | |
| **1979** | 8.6 | 9.2 | 9.3 | 9.3 | 9.4 | 9.3 | 9.6 | 10.0 | 9.9 | 10.1 | 10.6 | 11.3 | 9.8 | | |
| **1980** | 12.0 | 12.0 | 12.5 | 13.0 | 13.3 | 13.6 | 12.4 | 11.8 | 12.0 | 12.3 | 12.1 | 12.2 | 12.4 | | |
| **1981** | 11.4 | 10.9 | 10.0 | 9.5 | 9.5 | 9.4 | 11.1 | 11.6 | 11.8 | 10.9 | 10.2 | 9.5 | 10.4 | | |
| **1982** | 9.3 | 9.1 | 8.8 | 8.9 | 8.7 | 8.6 | 7.6 | 7.1 | 5.9 | 5.9 | 5.3 | 4.5 | 7.4 | | |
| **1983** | 4.7 | 4.7 | 4.7 | 4.3 | 3.6 | 2.9 | 3.0 | 3.0 | 3.5 | 3.7 | 4.3 | 4.8 | 4.0 | | |
| **1984** | 4.8 | 4.8 | 5.0 | 5.0 | 5.2 | 5.1 | 5.0 | 5.1 | 5.1 | 4.9 | 4.6 | 4.7 | 5.0 | | |
| **1985** | 4.5 | 4.7 | 4.8 | 4.5 | 4.5 | 4.4 | 4.2 | 4.1 | 4.0 | 4.1 | 4.4 | 4.3 | 4.3 | 4.7 | 4.3 |
| **1986** | 4.4 | 4.2 | 4.1 | 4.2 | 4.0 | 4.0 | 4.1 | 4.0 | 4.1 | 4.0 | 3.8 | 3.8 | 4.0 | 4.1 | 4.0 |
| **1987** | 3.8 | 3.8 | 4.0 | 4.2 | 4.2 | 4.1 | 4.0 | 4.2 | 4.3 | 4.3 | 4.4 | 4.2 | 4.1 | 4.0 | 4.2 |
| **1988** | 4.3 | 4.3 | 4.4 | 4.3 | 4.3 | 4.5 | 4.5 | 4.4 | 4.4 | 4.5 | 4.4 | 4.7 | 4.4 | 4.4 | 4.5 |
| **1989** | 4.6 | 4.8 | 4.7 | 4.6 | 4.6 | 4.5 | 4.6 | 4.4 | 4.3 | 4.3 | 4.4 | 4.4 | 4.5 | 4.6 | 4.3 |
| **1990** | 4.4 | 4.6 | 4.9 | 4.8 | 4.8 | 4.9 | 5.0 | 5.5 | 5.5 | 5.3 | 5.3 | 5.2 | 5.0 | 4.8 | 5.3 |
| **1991** | 5.6 | 5.6 | 5.2 | 5.1 | 5.1 | 5.0 | 4.8 | 4.6 | 4.5 | 4.4 | 4.5 | 4.4 | 4.9 | 5.3 | 4.6 |
| **1992** | 3.9 | 3.8 | 3.9 | 3.9 | 3.8 | 3.8 | 3.7 | 3.5 | 3.3 | 3.5 | 3.4 | 3.3 | 3.7 | 3.8 | 3.4 |

Added Columns to Calculate Inflation Factor

| Annual Factor | Factor to 2021 |
|---|---|
| 1.024 | 9.246 |
| 1.020 | 9.029 |
| 1.013 | 8.852 |
| 1.013 | 8.739 |
| 1.013 | 8.627 |
| 1.013 | 8.516 |
| 1.016 | 8.407 |
| 1.012 | 8.274 |
| 1.024 | 8.176 |
| 1.036 | 7.985 |
| 1.046 | 7.707 |
| 1.058 | 7.368 |
| 1.063 | 6.964 |
| 1.047 | 6.551 |
| 1.030 | 6.257 |
| 1.036 | 6.075 |
| 1.083 | 5.864 |
| 1.091 | 5.415 |
| 1.065 | 4.963 |
| 1.063 | 4.660 |
| 1.074 | 4.384 |
| 1.098 | 4.082 |
| 1.124 | 3.718 |
| 1.104 | 3.307 |
| 1.074 | 2.996 |
| 1.040 | 2.789 |
| 1.050 | 2.682 |
| 1.043 | 2.554 |
| 1.040 | 2.449 |
| 1.041 | 2.355 |
| 1.044 | 2.262 |
| 1.045 | 2.167 |
| 1.050 | 2.074 |
| 1.049 | 1.975 |
| 1.037 | 1.883 |

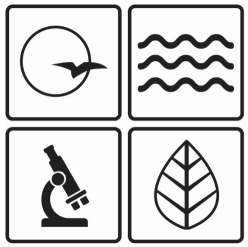
**CPI-All Urban Consumers (Current Series)**
**12-Month Percent Change**
US Department of Labor - Bureau of Labor Statistics
**Series Id:** CUUR0000SA0L1E
**Not Seasonally Adjusted**
**Series Title:** All items less food and energy in U.S. city
**Area:**
**Item:** All items less food and energy
**Base Period:** 1982-84=100
**Years:** 1958 to 2020

https://data.bls.gov/pdq/SurveyOutputServlet
Search for CUUR0000SA0L1E
More Formatting Options
12-month percent change

Added Columns to Calculate Inflation Factor

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual | HALF1 | HALF2 | Annual Factor | Factor to 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1993** | 3.5 | 3.6 | 3.4 | 3.5 | 3.4 | 3.3 | 3.2 | 3.3 | 3.2 | 3.0 | 3.1 | 3.2 | 3.3 | 3.4 | 3.2 | 1.033 | 1.815 |
| **1994** | 2.9 | 2.8 | 2.9 | 2.8 | 2.8 | 2.9 | 2.9 | 2.9 | 3.0 | 2.9 | 2.8 | 2.6 | 2.8 | 2.8 | 2.9 | 1.028 | 1.757 |
| **1995** | 2.9 | 3.0 | 3.0 | 3.1 | 3.1 | 3.0 | 3.0 | 2.9 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 1.030 | 1.710 |
| **1996** | 3.0 | 2.9 | 2.8 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 | 2.7 | 2.6 | 2.6 | 2.6 | 2.7 | 2.7 | 2.7 | 1.027 | 1.660 |
| **1997** | 2.5 | 2.5 | 2.5 | 2.7 | 2.5 | 2.4 | 2.4 | 2.3 | 2.2 | 2.3 | 2.2 | 2.2 | 2.4 | 2.6 | 2.2 | 1.024 | 1.616 |
| **1998** | 2.2 | 2.3 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.5 | 2.5 | 2.3 | 2.3 | 2.4 | 2.3 | 2.2 | 2.4 | 1.023 | 1.578 |
| **1999** | 2.4 | 2.1 | 2.1 | 2.2 | 2.0 | 2.1 | 2.1 | 1.9 | 2.0 | 2.1 | 2.1 | 1.9 | 2.1 | 2.1 | 2.0 | 1.021 | 1.543 |
| **2000** | 2.0 | 2.2 | 2.4 | 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | 2.6 | 2.5 | 2.6 | 2.6 | 2.4 | 2.3 | 2.5 | 1.024 | 1.511 |
| **2001** | 2.6 | 2.7 | 2.7 | 2.6 | 2.5 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.8 | 2.7 | 2.6 | 2.6 | 2.7 | 1.026 | 1.476 |
| **2002** | 2.6 | 2.6 | 2.4 | 2.5 | 2.5 | 2.3 | 2.2 | 2.4 | 2.2 | 2.2 | 2.0 | 1.9 | 2.4 | 2.5 | 2.2 | 1.024 | 1.438 |
| **2003** | 1.9 | 1.7 | 1.7 | 1.5 | 1.6 | 1.5 | 1.5 | 1.3 | 1.2 | 1.3 | 1.1 | 1.1 | 1.4 | 1.7 | 1.3 | 1.014 | 1.404 |
| **2004** | 1.1 | 1.2 | 1.6 | 1.8 | 1.7 | 1.9 | 1.8 | 1.7 | 2.0 | 2.0 | 2.2 | 2.2 | 1.8 | 1.6 | 2.0 | 1.018 | 1.385 |
| **2005** | 2.3 | 2.4 | 2.3 | 2.2 | 2.2 | 2.0 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.1 | 1.022 | 1.361 |
| **2006** | 2.1 | 2.1 | 2.1 | 2.3 | 2.4 | 2.6 | 2.7 | 2.8 | 2.9 | 2.7 | 2.6 | 2.6 | 2.5 | 2.2 | 2.7 | 1.025 | 1.331 |
| **2007** | 2.7 | 2.7 | 2.5 | 2.3 | 2.2 | 2.2 | 2.2 | 2.1 | 2.1 | 2.2 | 2.3 | 2.4 | 2.3 | 2.4 | 2.3 | 1.023 | 1.299 |
| **2008** | 2.5 | 2.3 | 2.4 | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 | 2.2 | 2.0 | 1.8 | 2.3 | 2.3 | 2.3 | 1.023 | 1.270 |
| **2009** | 1.7 | 1.8 | 1.8 | 1.9 | 1.8 | 1.7 | 1.5 | 1.4 | 1.5 | 1.7 | 1.7 | 1.8 | 1.7 | 1.8 | 1.6 | 1.017 | 1.241 |
| **2010** | 1.6 | 1.3 | 1.1 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.6 | 0.8 | 0.8 | 1.0 | 1.1 | 0.8 | 1.010 | 1.220 |
| **2011** | 1.0 | 1.1 | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 2.0 | 2.0 | 2.1 | 2.2 | 2.2 | 1.7 | 1.3 | 2.0 | 1.017 | 1.208 |
| **2012** | 2.3 | 2.2 | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 1.9 | 2.0 | 2.0 | 1.9 | 1.9 | 2.1 | 2.2 | 2.0 | 1.021 | 1.188 |
| **2013** | 1.9 | 2.0 | 1.9 | 1.7 | 1.7 | 1.6 | 1.7 | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 | 1.8 | 1.8 | 1.7 | 1.018 | 1.164 |
| **2014** | 1.6 | 1.6 | 1.7 | 1.8 | 2.0 | 1.9 | 1.9 | 1.7 | 1.7 | 1.8 | 1.7 | 1.6 | 1.7 | 1.8 | 1.7 | 1.017 | 1.143 |
| **2015** | 1.6 | 1.7 | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 | 2.1 | 1.8 | 1.7 | 1.9 | 1.018 | 1.124 |
| **2016** | 2.2 | 2.3 | 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.3 | 2.2 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 1.022 | 1.104 |
| **2017** | 2.3 | 2.2 | 2.0 | 1.9 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.8 | 1.7 | 1.8 | 1.8 | 2.0 | 1.7 | 1.018 | 1.080 |
| **2018** | 1.8 | 1.8 | 2.1 | 2.1 | 2.2 | 2.3 | 2.4 | 2.2 | 2.2 | 2.1 | 2.2 | 2.2 | 2.1 | 2.1 | 2.2 | 1.021 | 1.061 |
| **2019** | 2.2 | 2.1 | 2.0 | 2.1 | 2.0 | 2.1 | 2.2 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.3 | 1.022 | 1.039 |
| **2020** | 2.3 | 2.4 | 2.1 | 1.4 | 1.2 | 1.2 | 1.6 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.7 | 1.8 | 1.6 | 1.017 | 1.000 |

# CENSUS OF MISSOURI PUBLIC WATER SYSTEMS 2020



Missouri Department of Natural Resources
Division of Environmental Quality
Water Protection Program
Public Drinking Water Branch

# City Water Systems

| Community Water System Name | | Year Began | Operator Level | Owner Code | Population Served | Service Connections | Pct Sur Water | Pct Grd Water | Pct GW Under Infl | Pct Pur Sur Water | Pct Pur Grd Water | Pct Pur GW Und Infl | Supply Capacity MGD | Avg Daily Consumption MGD | Finished Water Storage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OAK GROVE PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO1010589 | JACKSON | 1936 | 2 | L | 8,000 | 3,286 | 0 | 0 | 0 | 0 | 100 | 0 | | 0.5750 | 1.7500 |
| **OAK GROVE VILLAGE PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO6010590 | FRANKLIN | 1964 | D2 | L | 508 | 128 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1410 | 0.0500 | 0.3900 |
| **ODESSA PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO1010599 | LAFAYETTE | 1922 | B2 | L | 5,300 | 2,185 | 0 | 100 | 0 | 0 | 0 | 0 | 1.6000 | 0.5000 | 1.6270 |
| **OFALLON PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO6010588 | ST CHARLES | 1940 | B3 | L | 32,515 | 12,400 | 0 | 89 | 0 | 11 | 0 | 0 | 6.5000 | 3.8000 | 5.6250 |
| **ORAN PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO4010604 | SCOTT | 1937 | 2 | L | 1,294 | 492 | 0 | 100 | 0 | 0 | 0 | 0 | 0.4100 | 0.1800 | 0.2220 |
| **OREGON PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO1010605 | HOLT | 1912 | C2 | L | 1,371 | 569 | 0 | 100 | 0 | 0 | 0 | 0 | 0.4320 | 0.1550 | 0.2500 |
| **ORONOGO PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO5010606 | JASPER | 1906 | 2 | L | 2,500 | 990 | 0 | 100 | 0 | 0 | 0 | 0 | 0.9860 | 0.3970 | 0.7000 |
| **ORRICK PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO1010607 | RAY | 1955 | 1 | L | 800 | 340 | 0 | 0 | 0 | 0 | 100 | 0 | | 0.0950 | 0.1500 |
| **OSAGE BEACH EAST PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO3011367 | CAMDEN | 2002 | D2 | L | 2,611 | 1,334 | 0 | 100 | 0 | 0 | 0 | 0 | 2.4760 | 0.6410 | 1.4000 |
| **OSAGE BEACH WEST PWS** | | | | | | | | | | | | | | | |
| System ID Number | County Location | | | | | | | | | | | | | | |
| MO3011346 | CAMDEN | 2003 | D1 | L | 1,740 | 1,295 | 0 | 100 | 0 | 0 | 0 | 0 | 1.8430 | 0.4760 | 1.5000 |

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 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

| | |
|---|---|
| Permit No.: | MO-0022918 |
| Owner: | City of Orrick |
| Address: | 207 West South Front Street, Orrick, MO 64077 |
| Continuing Authority: | Same as above |
| Address: | Same as above |
| Facility Name: | Orrick Wastewater Treatment Facility |
| Facility Address: | 0.3 miles northwest of Hwy Z and Centennial Road intersection, Orrick, MO 64077 |
| Legal Description: | Sec. 26, T51N, R29W, Ray County |
| UTM Coordinates: | X = 403290, Y = 4339139 |
| Receiving Stream: | Keeney Creek (C) |
| First Classified Stream and ID: | Keeney Creek (C) (384) |
| USGS Basin & Sub-watershed No.: | (10300101-0408) |

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

## FACILITY DESCRIPTION

Outfall #001 – POTW
The use or operation of this facility shall be by or under the supervision of a Certified "D" Operator.
Two-cell aerated lagoon / aeration basin / sludge retained in lagoon
Design population equivalent is 1,184.
Design flow is 118,400 gallons per day.
Actual flow is 11,087 gallons per day.
Design sludge production is 17.76 dry tons/year.

Permitted Feature INF – Influent Monitoring Location – Influent Manhole

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.

October 1, 2020
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

December 31, 2023
Expiration Date

Chris Wieberg, Director, Water Protection Program

| OUTFALL #001 | TABLE A-1. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS |
|---|---|

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in **Table A-2** must be achieved as soon as possible but no later than **November 1, 2021**. These interim effluent limitations in **Table A-1** are effective beginning **October 1, 2020** and remain in effect through **October 31, 2021** or as soon as possible. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

| EFFLUENT PARAMETER(S) | UNITS | INTERIM EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| **Limit Set: M** | | | | | | |
| Flow | MGD | * | | * | once/month | 24 hr. estimate |
| Biochemical Oxygen Demand$_5$ | mg/L | | 65 | 45 | once/month | grab |
| Total Suspended Solids | mg/L | | 110 | 70 | once/month | grab |
| *E. coli* (**Note 1, Page 4**) | #/100mL | | 1030 | 206 | once/week | grab |
| Oil & Grease | mg/L | 15 | | 10 | once/month | grab |
| Ammonia as N | mg/L | * | | * | once/month | grab |

| EFFLUENT PARAMETER(S) | UNITS | MINIMUM | | MAXIMUM | MEASUREMENT FREQUENCY | SAMPLE TYPE |
|---|---|---|---|---|---|---|
| pH – Units** | SU | 6.5 | | 9.0 | once/month | grab |

| EFFLUENT PARAMETER(S) | UNITS | MONTHLY AVERAGE MINIMUM | MEASUREMENT FREQUENCY | SAMPLE TYPE |
|---|---|---|---|---|
| Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2, Page 5**) | % | 65 | once/month | calculated |
| Total Suspended Solids – Percent Removal (**Note 2, Page 5**) | % | 65 | once/month | calculated |

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE NOVEMBER 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

| EFFLUENT PARAMETER(S) | UNITS | INTERIM EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| **Limit Set: Q** | | | | | | |
| Total Phosphorus | mg/L | * | | * | once/quarter*** | grab |
| Total Kjeldahl Nitrogen | mg/L | * | | * | once/quarter*** | grab |
| Nitrite + Nitrate | mg/L | * | | * | once/quarter*** | grab |

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021.

* Monitoring requirement only.
** 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** | **Quarterly Effluent Parameters** | **Report is Due** |
| First | January, February, March | Sample at least once during any month of the quarter | April 28th |
| Second | April, May, June | Sample at least once during any month of the quarter | July 28th |
| Third | July, August, September | Sample at least once during any month of the quarter | October 28th |
| Fourth | October, November, December | Sample at least once during any month of the quarter | January 28th |

| OUTFALL #001 | TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS |
|---|---|

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-2** shall become effective on **November 1, 2021** 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/month | 24 hr. estimate |
| Biochemical Oxygen Demand$_5$ | mg/L | | 65 | 45 | once/month | grab |
| Total Suspended Solids | mg/L | | 110 | 70 | once/month | grab |
| *E. coli* (**Note 1, Page 4**) | #/100mL | | 1030 | 206 | once/week | grab |
| Oil & Grease | mg/L | 15 | | 10 | once/month | grab |
| Ammonia as N | | | | | | |
| (January) | | 8.4 | | 2.4 | | |
| (February) | | 8.4 | | 2.4 | | |
| (March) | | 8.4 | | 2.4 | | |
| (April) | | 6.9 | | 1.9 | | |
| (May) | | 8.4 | | 1.6 | | |
| (June) | mg/L | 7.6 | | 1.1 | once/month | grab |
| (July) | | 6.9 | | 0.8 | | |
| (August) | | 8.4 | | 1.0 | | |
| (September) | | 6.9 | | 1.1 | | |
| (October) | | 6.9 | | 1.8 | | |
| (November) | | 8.4 | | 2.4 | | |
| (December) | | 8.4 | | 2.4 | | |

| EFFLUENT PARAMETER(S) | UNITS | MINIMUM | | MAXIMUM | MEASUREMENT FREQUENCY | SAMPLE TYPE |
|---|---|---|---|---|---|---|
| pH – Units** | SU | 6.5 | | 9.0 | once/month | grab |

| EFFLUENT PARAMETER(S) | UNITS | MONTHLY AVERAGE MINIMUM | MEASUREMENT FREQUENCY | SAMPLE TYPE |
|---|---|---|---|---|
| Biochemical Oxygen Demand$_5$ – Percent Removal (**Note 2, Page 5**) | % | 65 | once/month | calculated |
| Total Suspended Solids – Percent Removal (**Note 2, Page 5**) | % | 65 | once/month | calculated |

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE DECEMBER 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.

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

| OUTFALL #001 | TABLE A-2 continued. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS |
|---|---|

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-4** shall become effective on **November 1, 2021** 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: Q** | | | | | | |
| Total Phosphorus | mg/L | * | | * | once/quarter*** | grab |
| Total Kjeldahl Nitrogen | mg/L | * | | * | once/quarter*** | grab |
| Nitrite + Nitrate | mg/L | * | | * | once/quarter*** | grab |

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2022.

* Monitoring requirement only.
** 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** | **Quarterly Effluent Parameters** | **Report is Due** |
| First | January, February, March | Sample at least once during any month of the quarter | April 28th |
| Second | April, May, June | Sample at least once during any month of the quarter | July 28th |
| Third | July, August, September | Sample at least once during any month of the quarter | October 28th |
| Fourth | October, November, December | Sample at least once during any month of the quarter | January 28th |

**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).

| PERMITTED FEATURE INF | TABLE B-1. INFLUENT MONITORING REQUIREMENTS |
|---|---|

The monitoring requirements in **Table B-1** shall become effective on **October 1, 2020** 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: IM** | | | | | | |
| Biochemical Oxygen Demand$_5$ (**Note 2**) | mg/L | | | * | once/month | grab |
| Total Suspended Solids (**Note 2**) | mg/L | | | * | once/month | grab |
| MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE NOVEMBER 28, 2020. | | | | | | |
| **Limit Set: IQ** | | | | | | |
| Ammonia as N | mg/L | * | | * | once/quarter*** | grab |
| Total Phosphorus | mg/L | * | | * | once/quarter*** | grab |
| Total Kjeldahl Nitrogen | mg/L | * | | * | once/quarter*** | grab |
| Nitrite + Nitrate | mg/L | * | | * | once/quarter*** | grab |
| MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JANUARY 28, 2021. | | | | | | |

* Monitoring requirement only.
*** See table below for quarterly sampling requirements.

**Note 2** – Influent sampling for $BOD_5$ and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Calculate Percent Removal by using 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 grab sample.

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

## C. SCHEDULE OF COMPLIANCE

The permit for this facility issued on November 1, 2013 included new effluent limitations, and an 8 year schedule to attain compliance with those final effluent limitations. This permit contains the remaining portion of the schedule. Compliance must be achieved by **November 1, 2021**.

1. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every 12 months from November 1, 2013.

2. By November 1, 2021 the permittee shall attain compliance with the final effluent limits for Ammonia as N.

Please submit progress reports to the Missouri Department of Natural Resources via the Electronic Discharge Monitoring Report (eDMR) Submission System.

## 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.
   (a) Discharge Monitoring Reporting Requirements. The permittee must electronically submit compliance monitoring data via the eDMR system. In regards to Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit.
   (b) Programmatic Reporting Requirements. The following reports (if required by this permit) must be electronically submitted as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:
      (1) Collection System Maintenance Annual Reports;
      (2) Schedule of Compliance Progress Reports; and
      (3) Any additional report required by the permit excluding bypass reporting.
      After such a system has been made available by the Department, required data shall be directly input into the system by the next report due date.
   (c) Other actions. The following shall be submitted electronically after such a system has been made available by the Department:
      (1) Notices of Termination (NOTs); and
      (2) Bypass reporting, See Special Condition #9 for 24-hr. bypass reporting requirements.
   (d) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx.
   (e) Waivers from Electronic Reporting. The permittee must submit compliance monitoring data and reports electronically. The Department may grant a waiver to a permittee in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective.

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.

**E. SPECIAL CONDITIONS (continued)**

3. All outfalls must be clearly marked in the field.

4. Report as no-discharge when a discharge does not occur 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) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum 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.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

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. Upon approval of the request, the Department will modify the permit.

8. The permittee shall develop and implement a program for maintenance and repair of its collection system. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model located at http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. Additional information regarding the Departments' CMOM Model is available at http://dnr.mo.gov/pubs/pub2574.htm.

   The permittee shall also submit a report via the Electronic Discharge Monitoring Report (eDMR) Submission System annually, by January 28th, for the previous calendar year. The report shall contain the following information:
   (a) A summary of the efforts to locate and eliminate specific 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 Kansas City Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: https://dnr.mo.gov/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.

**E. SPECIAL CONDITIONS (continued)**

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 to the treatment facility shall be maintained.

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.

14. The lagoon(s) shall be operated and maintained to ensure their structural integrity, which includes maintaining adequate freeboard and keeping the berms free of deep-rooted vegetation, animal dens, or other potential sources of damage.

15. The facility shall ensure that adequate provisions are provided to prevent or minimize surface water intrusion into the lagoon and to divert stormwater runoff around the lagoon and protect embankments from erosion.

**F. NOTICE OF RIGHT TO APPEAL**

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty 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

# MISSOURI DEPARTMENT OF NATURAL RESOURCES
# FACT SHEET
# FOR THE PURPOSE OF RENEWAL
# OF
# MO-0022918
# ORRICK WWTF

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 Minor facility.

## Part I – Facility Information

Facility Type: POTW

Facility Description: Two-cell aerated lagoon / aeration basin / sludge retained in lagoon

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

Application Date: 04/30/18
Expiration Date: 12/31/18

**OUTFALL(S) TABLE:**

| OUTFALL | DESIGN FLOW (CFS) | TREATMENT LEVEL | EFFLUENT TYPE |
|---|---|---|---|
| #001 | 0.1835 | Equivalent to Secondary | Domestic |

Facility Performance History:
This facility was last inspected on July 14, 2016. The inspection showed the following unsatisfactory features, failure to

- operate and maintain the facility
- provide proper warning signs on all perimeter fence
- remove deep rooted vegetation
- comply with effluent limits
- maintain the inner berm slopes of the lagoon to be less than three to 1 (3:1)
- upgrade facility for compliance with final bacteria effluent limitations as required in the schedule of compliance

The KCRO staff brought these violations to the permittee's attention in a correspondence dated December 20, 2016. On June 7, 2017, the KCRO staff referred this matter to the department's Compliance and Enforcement Section of the Water Protection Program for review, and the program determined that a monetary penalty for these violations was warranted.

Review of DMR History for the past 5 years shows:

- BOD exceedances 8/15 and 4/18
- TSS exceedances 5/15, 6/15, 9/15, 10/15, 2/16, 5/16, 6/16, 8/16, 9/16, 5/17, 7/17, 9/30, 4/18,7/18, 4/19, and 7/19
- E. coli exceedances 7/15, 4/18, 7/19, and 9/19
- pH exceedances 4/16 and 5/18
- Acute WET test non-receipt

Comments:
Changes in this permit for Outfall #001 include the following:

- the recalculation of Ammonia as N final effluent limits in Table A-2
- pH limits include an upper limit of 9.0 Maximum
- BOD and TSS percent removal increased to monthly sampling frequency
- E. coil sampling increased from monthly to weekly as required per 10 CSR 20-7.15(9)(D)7.A.
- The addition of quarterly monitoring for Total Kjeldahl Nitrogen, Nitrate + Nitrite, and Total Phosphorous as required per 10 CSR 20-7.015(9)(D)8 for facilities >100,000 gpd.
- The removal of Acute WET test as the permit writer established numeric effluent limitations where reasonable potential exists.

Although the facility currently has E. coli Limits in the permit the facility has never constructed a disinfection system. See Part VI of the Fact Sheet for further information regarding the addition, revision, and removal of effluent parameters.

Changes in this permit for Permitted Feature INF include BOD and TSS influent monitoring increased to monthly to be consistent with effluent sampling requirements. Also the addition of quarterly influent monitoring for Ammonia as N, Total Kjeldahl Nitrogen, Nitrate+ Nitrite, and Total Phosphorous as required per 10 CSR 20-7.015(9)(D)8. See Part VI of the Fact Sheet for further information regarding the addition, revision, and removal of influent parameters.

Special conditions were updated to include the requirement to submit compliance monitoring data electronically via the eDMR system. The removal of special conditions requiring gates and warning signs, but the facility must remain sufficiently secured to restrict access per special condition 10 and the removal of special condition for Acute WET test.

## 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 | ☐ - State agency |
| ☐ - County | ☐ - Public Water Supply Districts |
| ☐ - Public Sewer District | ☐ - Private Sewer Company regulated by the Public Service Commission |

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

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

Operator's Name: Dale Bosley
Certification Number: 14127
Certification Level: WW-D

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 publicly 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 publicly 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. These operational monitoring reports are to be submitted to the Department along with the MSOP discharge monitoring reports.

✓ The facility is a lagoon that is designed to discharge and is required to conduct operational control monitoring as follows:

| Operational Monitoring Parameter | Frequency |
|---|---|
| Precipitation | Twice/Week |
| Flow – Influent or Effluent | Twice/Week |
| pH – Primary Cell | Twice/Week |
| Dissolved Oxygen – Primary Cell | Twice/Week |

## 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) |
|---|---|---|---|---|---|
| Keeney Creek | C | 384 | AQL, HHP, IRR, LWW, SCR | 10300101-0408 | 1.92 |
| Fishing River | P | 383 | AQL, HHP, IRR, LWW, SCR, WBC-B | | |
| Missouri River | P | 356 | AQL, HHP, IRR, LWW, SCR, WBC-B | | 2.3 |

*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 1st 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 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 |
| Keeney Creek (C) | 0 | 0 | 0 |

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

**RECEIVING STREAM MONITORING REQUIREMENTS:**
No receiving water monitoring requirements recommended at this time.

Receiving Water Body's Water Quality
Currently, the Department has not conducted a stream survey for this waterbody. 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.

- **Acute Whole Effluent Toxicity (WET) test**. The previous permit included requirements to conduct an Acute WET test once during the permit cycle. The permit writer conducted a reasonable potential determination for all anticipated pollutants and established numeric effluent limitations where reasonable potential exists. The permit writer determined the facility does not have reasonable potential to exceed narrative water quality standards for acute toxicity at this time and the acute WET testing requirements have been removed from this permit. This determination will be reevaluated during the next permit renewal.

- **Ammonia as N**. Effluent limitations were re-calculated for Ammonia. The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation. The newly established limitations are still protective of water quality.

- **Instream Total Phosphorus and Total Nitrogen Monitoring**. The previous permit contained upstream instream monitoring requirements for Total Phosphorus and Total Nitrogen. The Department has made a determination that monitoring of background nutrients is not needed. This permit is still protective of water quality and this determination will be reassessed at the time of renewal.

✓ 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 http://dnr.mo.gov/env/wpp/permits/antideg-implementation.htm

✓ 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 does not have stormwater discharges or the stormwater outfalls onsite have no industrial exposure.

**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 not authorized to land apply biosolids. Sludge/biosolids are stored in the lagoon. The permittee must receive approval for any treatment, removal, and disposal of sludge or biosolids that not identified in the facility description of the operating permit.

**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 currently under enforcement action. The enforcement action is due to failure to:
- operate and maintain the and maintain the facility per RSMo §644.051.1.(3) and 10 CSR 20-6.010(8)(A)4;
- remove deep rooted vegetation per 10 CSR 20-6.020(13)(A)3.G;
- maintain the inner berm slopes of the lagoon to be less than 3:1 per 10 CSR 20-8.020(13)(A)3.C;
- comply with effluent limits contained in part A RSMo §644.051.1.(3 ) and 10 CSR 20-6-.010(8)(A)4; and
- upgrade completed on the system for compliance with final bacteria limits RSMo §644.076.1. and 10 CSR 20-6.010(7)(A).

**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 optional and found on the Department's website at the following locations:

Operational Monitoring Lagoon: http://dnr.mo.gov/forms/780-2801-f.pdf
Operational Monitoring Mechanical: http://dnr.mo.gov/forms/780-2800-f.pdf
I&I Report: http://dnr.mo.gov/forms/780-2690-f.pdf

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: http://dnr.mo.gov/forms/780-2692-f.pdf. Each facility must make a request. If a single entity owns or operates more than one facility, 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 ($BOD_5$) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals.

✓ Equivalent to Secondary Treatment is 65% removal [40 CFR Part 133.105(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 http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. For additional information regarding the Departments' CMOM Model, see the CMOM Plan Model Guidance document at http://dnr.mo.gov/pubs/pub2574.htm. 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 SOCs, and attain a greater level of consistency, on April 9, 2015 the Department issued an updated policy on development of SOCs. 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.

✓ The permit for this facility issued on November 1, 2013 included new effluent limitations for ammonia, and an 8 year schedule to attain compliance with those final effluent limitations. The time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(11)]. This permit contains the remaining portion of the schedule.

**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 http://dnr.mo.gov/env/wpp/permits/sewer-extension.htm.

✓ 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 June 2015], 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 (http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf).
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: http://dnr.mo.gov/forms/index.html.

✓ At this time, the permittee is not required to develop and implement a SWPPP.

**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:

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

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

**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 $BOD_5$ 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 $NH_3$)
- ☒ Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- ☐ Other – please justify.

✓ At this time, the permittee is not required to conduct WET test for this facility. The permit writer conducted a reasonable potential determination for all anticipated pollutants and established numeric effluent limitations where reasonable potential exists. There this permit will not be requiring a WET test.

**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 or to a stream with an EPA approved TMDL.

## Part VI – Effluent Limits Determination

### OUTFALL #001 – MAIN FACILITY OUTFALL

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

### EFFLUENT LIMITATIONS TABLE:

| PARAMETER | Unit | Basis for Limits | Daily Maximum | Weekly Average | Monthly Average | Previous Permit Limit | Sampling Frequency | Reporting Frequency | Sample Type **** |
|---|---|---|---|---|---|---|---|---|---|
| Flow | MGD | 1 | * | | * | */* | 1/month | monthly | E |
| $BOD_5$ | mg/L | 1 | | 65 | 45 | 65/45 | 1/month | monthly | G |
| TSS | mg/L | 1 | | 110 | 70 | 110/70 | 1/month | monthly | G |
| *Escherichia coli*** | #/100mL | 1, 3 | | 1030 | 206 | 1030/206 | 1/weekly | monthly | G |
| Ammonia as N | | | | | | | | | |
| (January) | | | 8.4 | | 2.4 | | | | |
| (February) | | | 8.4 | | 2.4 | | | | |
| (March) | | | 8.4 | | 2.4 | Apr – Sep: | | | |
| (April) | | | 6.9 | | 1.9 | 3.6/1.4 | | | |
| (May) | | | 8.4 | | 1.6 | | | | |
| (June) | mg/L | 2, 3 | 7.6 | | 1.1 | | 1/month | monthly | G |
| (July) | | | 6.9 | | 0.8 | Oct - Mar: | | | |
| (August) | | | 8.4 | | 1.0 | 7.5/2.9 | | | |
| (September) | | | 6.9 | | 1.1 | | | | |
| (October) | | | 6.9 | | 1.8 | | | | |
| (November) | | | 8.4 | | 2.4 | | | | |
| (December) | | | 8.4 | | 2.4 | | | | |
| Oil & Grease | mg/L | 1, 3 | 15 | | 10 | 15/10 | 1/month | monthly | G |
| Total Phosphorus | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |
| Total Kjeldahl Nitrogen | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |
| Nitrite + Nitrate | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |

| PARAMETER | Unit | Basis for Limits | Minimum | | Maximum | Previous Permit Limit | Sampling Frequency | Reporting Frequency | Sample Type |
|---|---|---|---|---|---|---|---|---|---|
| pH | SU | 1 | 6.5 | | 9.0 | ≥6.5 | 1/month | monthly | G |

| PARAMETER | Unit | Basis for Limits | Daily Minimum | | Monthly Avg. Min | Previous Permit Limit | Sampling Frequency | Reporting Frequency | Sample Type |
|---|---|---|---|---|---|---|---|---|---|
| $BOD_5$ Percent Removal | % | 1 | | | 65 | 65 | 1/month | monthly | M |
| TSS Percent Removal | % | 1 | | | 65 | 65 | 1/month | monthly | M |

* - Monitoring requirement only.
** - #/100mL; the Monthly Average for *E. coli* is a geometric mean.
*** - Parameter not previously established in previous state operating permit.

**** - G = Grab
E = 24-hr. estimate
M = Measured/calculated

**Basis for Limitations Codes:**

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

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

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

- **Biochemical Oxygen Demand ($BOD_5$)**. Operating permit retains 65 mg/L as a Weekly Average and 45 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(8) for discharges to All Other Waters.

- **Total Suspended Solids (TSS)**. Operating permit retains 110 mg/L as a Weekly Average and 70 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(8) for discharges to All Other Waters.

Please note that the final effluent limits for BOD and TSS contained in the permit are Equivalent to Secondary limits as per 10 CSR 20-7.015. Any changes made to the lagoon system that modifies it such that it no longer functions as a typical lagoon will result in the facility no longer qualifying for Equivalent to Secondary limitations. The facility may be required to also follow the Missouri Antidegradation Rule and Implementation Procedure if the discharge is expanded.

- ***Escherichia coli (E. coli)***. Monthly average of 206 per 100 mL as a geometric mean and Weekly Average of 1,030 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 with Whole Body Contact Recreation (B) 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 = $5^{th}$ root of (1)(4)(6)(10)(5) = $5^{th}$ 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.

  The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation:

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

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

  In the event that mixing considerations derive an AML less stringent than the MDL, the AML and MDL will be equal and based on the MDL.

| Month | Temp (°C)* | pH (SU)* | Total Ammonia Nitrogen CCC (mg/L) | Total Ammonia Nitrogen CMC (mg/L) |
|---|---|---|---|---|
| January | 2.3 | 8.0 | 2.4 | 8.4 |
| February | 2.7 | 8.0 | 2.4 | 8.4 |
| March | 9.1 | 8.0 | 2.4 | 8.4 |
| April | 15.8 | 8.1 | 1.9 | 6.9 |
| May | 20.3 | 8.0 | 1.6 | 8.4 |
| June | 26.0 | 8.1 | 1.1 | 7.6 |
| July | 28.8 | 8.1 | 0.8 | 6.9 |
| August | 28.1 | 8.0 | 1.0 | 8.4 |
| September | 23.6 | 8.1 | 1.1 | 6.9 |
| October | 16.1 | 8.1 | 1.8 | 6.9 |
| November | 10.3 | 8.0 | 2.4 | 8.4 |
| December | 4.0 | 8.0 | 2.4 | 8.4 |

* Ecoregion data (Western Corn Belt Plains)

**January**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)2.4 – (0.0 * 0.01))/0.184 = 2.4 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)8.4 – (0.0 * 0.01))/0.184 = 8.4 mg/L

Chronic WLA = AML = **2.4** mg/L
Acute WLA = MDL = **8.4** mg/L

**March**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)2.4 – (0.0 * 0.01))/0.184 = 2.4 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)8.4 – (0.0 * 0.01))/0.184 = 8.4 mg/L

Chronic WLA = AML = **2.4** mg/L
Acute WLA = MDL = **8.4** mg/L

**May**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)1.6 – (0.0 * 0.01))/ 0.184 = 1.6 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)8.4 – (0.0 * 0.01))/ 0.184 = 8.4 mg/L

Chronic WLA = AML = **1.6** mg/L
Acute WLA = MDL = **8.4** mg/L

**July**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)0.8 – (0.0 * 0.01))/ 0.184) = 0.8 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0) 6.9 – (0.0 * 0.01))/ 0.184) = 6.9 mg/L

Chronic WLA = AML = **0.8** mg/L
Acute WLA = MDL =6.9

**September**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)1.1 – (0.0 * 0.01))/ 0.184 = 1.1 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)6.9 – (0.0 * 0.01))/ 0.184 = 6.9 mg/L

Chronic WLA = AML = **1.1** mg/L
Acute WLA = MDL = **6.9** mg/L

**November**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)2.4 – (0.0 * 0.01))/ 0.184 = 2.4 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)8.4 – (0.0 * 0.01))/0.184 = 8.4 mg/L

Chronic WLA = AML = **2.4** mg/L
Acute WLA = MDL = **8.4** mg/L

**February**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)2.4 – (0.0 * 0.01))/0.184 = 2.4 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)8.4 – (0.0 * 0.01))/0.184 = 8.4 mg/L

Chronic WLA = AML = **2.4** mg/L
Acute WLA = MDL = **8.4** mg/L

**April**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)1.9 – (0.0 * 0.01))/0.184 = 1.9 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)6.9 – (0.0 * 0.01))/0.184 = 6.9 mg/L

Chronic WLA = AML = **1.9** mg/L
Acute WLA = MDL = **6.9** mg/L

**June**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)1.1 – (0.0 * 0.01))/ 0.184 = 1.1 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)7.6 – (0.0 * 0.01))/ 0.184 = 7.6 mg/L

Chronic WLA = AML = **1.1** mg/L
Acute WLA = MDL = **7.6** mg/L

**August**
Chronic WLA:
$C_e$ = ((0.184 + 0.0) 1.4 – (0.0 * 0.01))/ 0.184 = 1.0 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0) 8.4 – (0.0 * 0.01))/ 8.4 = 8.4 mg/L

Chronic WLA = AML = **1.0** mg/L
Acute WLA = MDL = **8.4** mg/L

**October**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)1.8 – (0.0 * 0.01))/ 0.184 = 1.8 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)6.9 – (0.0 * 0.01))/0.184 = 6.9 mg/L

Chronic WLA = AML = **1.8** mg/L
Acute WLA = MDL = **6.9** mg/L

**December**
Chronic WLA:
$C_e$ = ((0.184 + 0.0)2.4 – (0.0 * 0.01))/2.4 = 2.4 mg/L

Acute WLA:
$C_e$ = ((0.184 + 0.0)8.4 – (0.0 * 0.01))/8.4 = 8.4 mg/L

Chronic WLA = AML = **2.4** mg/L
Acute WLA = MDL = **8.4** mg/L

- **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 are required per 10 CSR 20-7.015(9)(D)8.

- **pH**. 6.5-9.0 SU. pH limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the in-stream Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. 10 CSR 20-7.015 allows pH for lagoons to be maintained above 6.0 SU. Due to the classification of the receiving stream, the Department has determined that there is no assimilative capacity during critical low flow periods, therefore the water quality standard must be met at the outfall.

- **Biochemical Oxygen Demand ($BOD_5$) 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 $BOD_5$ and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 65% removal efficiency for $BOD_5$.

- **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 $BOD_5$ and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 65% removal efficiency for TSS.

**Parameters Removed**. Acute WET test was removed. The permit writer conducted a reasonable potential determination for all anticipated pollutants and established numeric effluent limitations where reasonable potential exists.

**Sampling Frequency Justification**: The Department has determined that previously established sampling and reporting frequency is sufficient to characterize the facility's effluent and be protective of water quality. Sampling for *E. coli* is set at monthly per 10 CSR 20-7.015(9)(D)7.C.

**Sampling Type Justification**: As per 10 CSR 20-7.015, $BOD_5$ and TSS collected for lagoons may be grab samples. Grab samples 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 **** |
|---|---|---|---|---|---|---|---|---|---|
| $BOD_5$ | mg/L | 1 | | | * | * | 1/month | monthly | G |
| TSS | mg/L | 1 | | | * | * | 1/month | monthly | G |
| Ammonia as N | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |
| Total Phosphorus | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |
| Total Kjeldahl Nitrogen | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |
| Nitrite + Nitrate | mg/L | 1 | * | | * | *** | 1/quarter | quarterly | G |

* - Monitoring requirement only.
**** - G = Grab
*** - Parameter not previously established in previous state operating permit.

**Basis for Limitations Codes:**

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

**Influent Parameters**

- **Biochemical Oxygen Demand ($BOD_5$) and Total Suspended Solids (TSS)**. An influent sample is required to determine the removal efficiency. 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 $BOD_5$ and TSS for Publicly Owned Treatment Works (POTWs)/municipals.

- **Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia**. 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**: The sampling and reporting frequencies for Total Phosphorus and Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia parameters were established to match the required sampling frequency of these parameters in the effluent, per [10 CSR 20-7.015(9)(D)8.]. The sampling and reporting frequencies for influent $BOD_5$ and TSS have been established to match the required sampling frequency of these parameters in the effluent.

**Sampling Type Justification**: Sample types for influent parameters were established to match the required sampling type of these parameters in the effluent. 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. The facility was referred to enforcement December 20, 2016 for polluting waters of the state. The facility was last inspected July 14, 2016 and had unsatisfactory findings for violation of permit requirements. 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. This facility utilizes secondary treatment technology and this discharge is subject to Standard Condition. Based on the information reviewed during the drafting of this permit, it has been determined if the facility meets final effluent limitations as well as Standard and Special Conditions established in this permit, there is no reasonable potential for the discharge to cause 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) Waters shall provide for the attainment and maintenance of water quality standards downstream including waters of another state. Please see (D) above as justification is the same.
(F) There shall be no significant human health hazard from incidental contact with the water. Please see (D) above as justification is the same.
(G) There shall be no acute toxicity to livestock or wildlife watering. Please see (D) above as justification is the same.
(H) 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.
(I) 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 publicly-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 Orrick**

| New Permit Requirements | | | |
|---|---|---|---|
| Weekly effluent *E. coli*, monthly Influent BOD and TSS, quarterly influent and effluent Total Phosphorous, Total Kjeldahl Nitrogen and Nitrate and Nitrite | | | |
| Estimated Annual Cost | Annual Median Household Income (MHI) | Estimated Monthly User Rate | User Rate as a Percent of MHI |
| $1,963 | $62,269 | $21.98 | 0.42% |

## 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 4th Quarter of calendar year 2023.

**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 August 7, 2020 to September 7, 2020. No responses received.

**DATE OF FACT SHEET**: 5/20/2020

**COMPLETED BY:**

**HEATHER MARTIN, ENVIRONMENTAL SPECIALIST**
**MISSOURI DEPARTMENT OF NATURAL RESOURCES**
**WATER PROTECTION PROGRAM**
**OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT**
**(573)751-6569**
**Heather.martin@dnr.mo.gov**

## Appendices

**APPENDIX - CLASSIFICATION WORKSHEET:**

| Item | Points Possible | Points Assigned |
|---|---|---|
| Maximum Population Equivalent (P.E.) served , peak day | 1 pt./10,000 PE or major fraction thereof. (Max 10 pts.) | |
| Design Flow (avg. day) or peak month's flow (avg. day) whichever is larger | 1 pt. / MGD or major fraction thereof. (Max 10 pts.) | |
| **Effluent Discharge** | | |
| Missouri or Mississippi River | 0 | |
| All other stream discharges except to losing streams and stream reaches supporting whole body contact recreation | 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 |
| Direct reuse or recycle of effluent | 6 | |
| **Land Application/Irrigation** | | |
| Drip Irrigation | 3 | |
| Land application/irrigation | 5 | |
| Overland flow | 4 | |
| **Variation in Raw Wastes (highest level only)** | | |
| Variations do not exceed those normally or typically expected | 0 | 0 |
| Reoccurring deviations or excessive variations of 100 to 200 percent in strength and/or flow | 2 | |
| Reoccurring deviations or excessive variations of more than 200 percent in strength and/or flow | 4 | |
| Department-approved pretreatment program | 6 | |
| **Preliminary Treatment** | | |
| STEP systems (operated by the permittee) | 3 | |
| Screening and/or comminution | 3 | |
| Grit removal | 3 | |
| Plant pumping of main flow | 3 | |
| Flow equalization | 5 | |
| **Primary Treatment** | | |
| Primary clarifiers | 5 | |
| Chemical addition (except chlorine, enzymes) | 4 | |
| **Secondary Treatment** | | |
| Trickling filter and other fixed film media with or without secondary clarifiers | 10 | |
| Activated sludge (including aeration, oxidation ditches, sequencing batch reactors, membrane bioreactors, and contact stabilization) | 15 | |
| Stabilization ponds without aeration | 5 | |
| Aerated lagoon | 8 | 8 |
| Advanced Lagoon Treatment – Aerobic cells, anaerobic cells, covers, or fixed film | 10 | |
| Biological, physical, or chemical | 12 | |
| Carbon regeneration | 4 | |
| **Total from page ONE (1)** | **----** | **11** |

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

| ITEM | POINTS POSSIBLE | POINTS ASSIGNED |
|---|---|---|
| **Solids Handling** | | |
| Sludge Holding | 5 | |
| Anaerobic digestion | 10 | |
| Aerobic digestion | 6 | |
| Evaporative sludge drying | 2 | |
| Mechanical dewatering | 8 | |
| Solids reduction (incineration, wet oxidation) | 12 | |
| Land application | 6 | |
| **Disinfection** | | |
| Chlorination or comparable | 5 | |
| On-site generation of disinfectant (except UV light) | 5 | |
| Dechlorination | 2 | |
| UV light | 4 | |
| **Required Laboratory Control Performed by Plant Personnel (highest level only)** | | |
| Lab work done outside the plant | 0 | |
| 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 | 5 |
| More advanced determinations, such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc. | 7 | |
| Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph | 10 | |
| **Total from page TWO (2)** | ---- | 11 |
| **Total from page ONE (1)** | --- | 5 |
| **Grand Total** | --- | 16 |

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

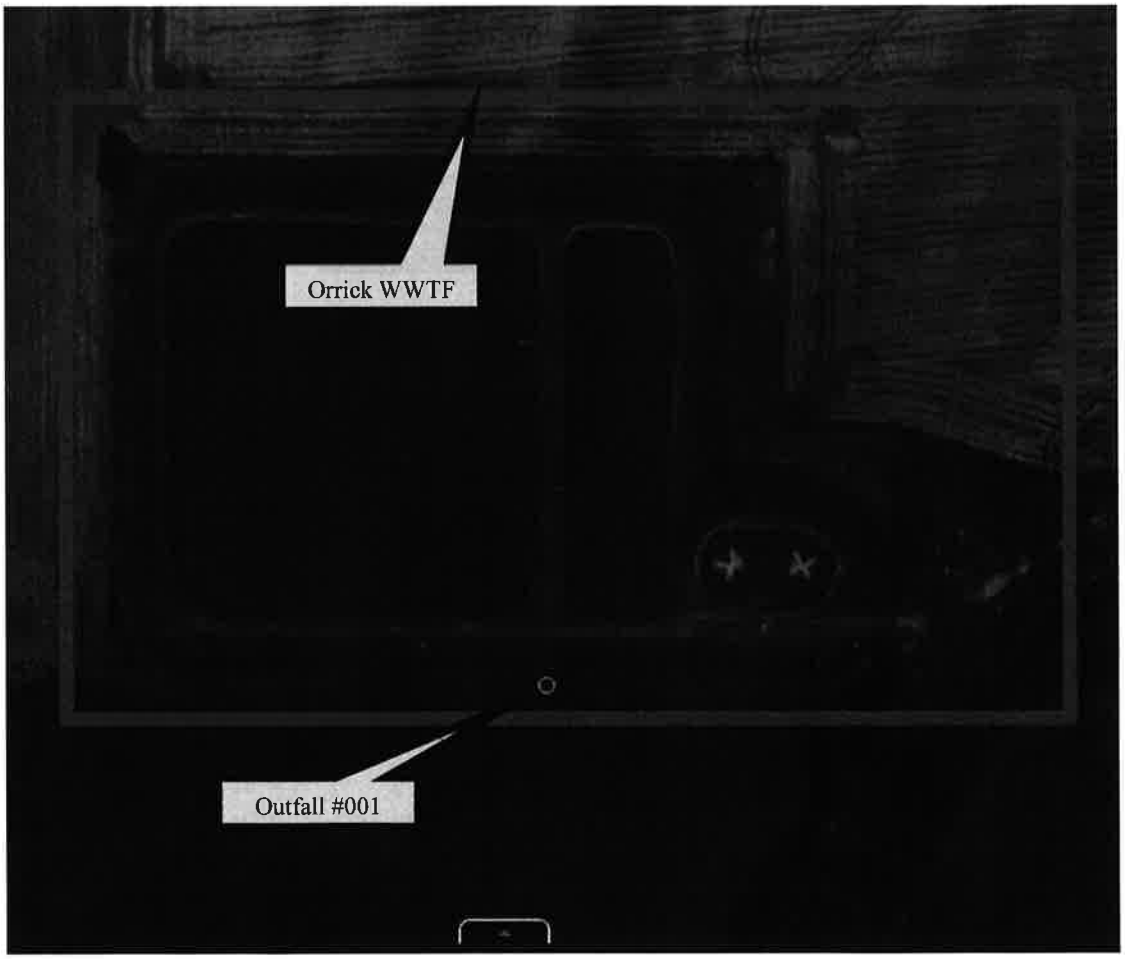
**APPENDIX – RPA RESULTS:**

| Parameter | CMC* | RWC Acute* | CCC* | RWC Chronic* | n** | Range max/min | CV*** | MF | RP Yes/No |
|---|---|---|---|---|---|---|---|---|---|
| Total Ammonia as Nitrogen (Summer) mg/L | 6.9 | 13.10 | 0.9 | 13.10 | 23 | 3.4/0.01 | 1.22 | 3.85 | YES |
| Total Ammonia as Nitrogen (Winter) mg/L | 8.4 | 63.47 | 2.4 | 63.47 | 21 | 13.1/0 | 1.47 | 4.85 | 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)**

**Orrick WWTF, Permit Renewal**
**City of Orrick**
**Missouri State Operating Permit #MO-0022918**

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**

The permit requires compliance with new weekly *E. coli*, monthly Influent BOD and TSS, quarterly effluent and influent Total Phosphorous, Total Kjeldahl Nitrogen and Nitrate and Nitrite.

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

| Connection Type | Number |
|---|---|
| Residential | 328 |
| Commercial | 10 |
| Industrial | 2 |
| **Total** | **340** |

**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 of Orrick's financial and socioeconomic situation. The financial questionnaire available to permittees on the Department's website (http://dnr.mo.gov/forms/780-2511-f.pdf) 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 Orrick | |
|---|---|
| Current Monthly User Rates per 5,000 gallons* | $21.50 |
| Median Household Income (MHI)[1] | $62,269 |
| Current Annual Operating Costs (excludes depreciation) | $312,464 |

*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 |
| BOD | Monthly | $41 | $328 |
| TSS | Monthly | $14 | $112 |
| *E. coli* | Weekly | $29 | $667 |
| Total Phosphorus – Effluent | Quarterly | $24 | $96 |
| Total Kjeldahl Nitrogen - Effluent | Quarterly | $33 | $132 |
| Nitrate + Nitrite - Effluent | Quarterly | $40 | $160 |
| Total Phosphorus – Influent | Quarterly | $24 | $96 |
| Total Kjeldahl Nitrogen - Influent | Quarterly | $33 | $132 |
| Nitrate + Nitrite - Influent | Quarterly | $40 | $160 |
| Ammonia - Influent | Quarterly | $20 | $80 |
| Total Estimated Annual Cost of New Permit Requirements | | | $1,963 |

| Criterion 2B Table. Estimated Costs for New Permit Requirements | | |
|---|---|---|
| (1) | Estimated Annual Cost | $1,963 |
| (2) | Estimated Monthly User Cost for New Requirements [2] | $0.48 |
| | Estimated Monthly User Cost for New Requirements as a Percent of MHI [3] | 0.009% |
| (3) | Total Monthly User Cost* | $21.98 |
| | Total Monthly User Cost as a Percent of MHI [4] | 0.424% |

* 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.

**(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 did not provide the Department with this information, nor could it be found through readily available data.

**(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 [1, 5-9] for the City of Orrick**

| No. | Administrative Unit | Orrick City | Missouri State | United States |
|---|---|---|---|---|
| 1 | Population (2018) | 689 | 6,090,062 | 322,903,030 |
| 2 | Percent Change in Population (2000-2018) | -22.5% | 8.8% | 14.7% |
| 3 | 2018 Median Household Income (in 2019 Dollars) | $62,269 | $54,530 | $61,385 |
| 4 | Percent Change in Median Household Income (2000-2018) | 8.2% | -6.3% | -4.7% |
| 5 | Median Age (2018) | 38.5 | 38.5 | 37.9 |
| 6 | Change in Median Age in Years (2000-2018) | 5.9 | 2.4 | 2.6 |
| 7 | Unemployment Rate (2018) | 4.5% | 5.1% | 5.9% |
| 8 | Percent of Population Below Poverty Level (2018) | 12.2% | 14.2% | 14.1% |
| 9 | Percent of Household Received Food Stamps (2018) | 11.1% | 11.6% | 12.2% |
| 10 | (Primary) County Where the Community Is Located | Ray County | | |

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

The community did not report any other investments relating to environmental improvements.

**(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 Orrick 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.

The Department contracted with Wichita State University to complete an assessment tool that would allow for predictions on rural Missouri community populations and future sustainability. The purpose of the study is to use a statistical modeling analysis in order to determine factors associated with each rural Missouri community that would predict the future population changes that could occur in each community. A stepwise regression model was applied to 19 factors which were determined as predictors of rural population change in Missouri. The model established a hierarchy of the predicting factors which allowed the model to place a weighted value on each of the factors. A total of 745 rural towns and villages in Missouri received a weighted value for each of the predicting factors. The weighted values for each town / village were then added together to determine an overall decision score. The overall decision scores were then divided into five categories and each town was assigned to a different categorical group based on the overall decision score. The categorical groups were developed from the range of overall scores across all rural towns and villages within Missouri.

Based on the assessment tool, the City of Orrick has been determined to be a category 1 community. This means that the City of Orrick could potentially face more challenging socioeconomic circumstances over time and may have significant declines in population in the future. The Department has determined an adequate schedule of compliance that will alleviate the potential financial burdens that the City of Orrick may face due to the necessary upgrades required to meet the new permit requirements. If this community experiences a decline in population, which results in the inability to secure the necessary funding for an upgrade to meet the new requirements within this permit, a modification to the schedule of compliance may be necessary. The community may contact the Department and send an application for a modification to the schedule of compliance with justification for the time necessary to comply with this permit.

**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) 2018 MHI in 2018 Dollar: United States Census Bureau. United States Census Bureau. 2014-2018 American Community Survey 5-Year Estimates, Table B19013: Median Household Income in the Past 12 Months (in 2018 Inflation-Adjusted Dollars). https://data.census.gov/cedsci/table?q=B19013&tid=ACSDT5Y2018.B19013&vintage=2018.
   (B) 2000 MHI in 1999 Dollar: (1) For United States, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-1 Part 1. United States Summary, Table 5. Work Status and Income in 1999: 2000, Washington, DC. https://www.census.gov/prod/cen2000/phc-2-1-pt1.pdf. (2) For Missouri State, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-27, Missouri, Table 10. Work Status and Income in 1999: 2000, Washington, DC. https://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf.
   (C) 2019 CPI, 2018 CPI and 1999 CPI: U.S. Department of Labor Bureau of Labor Statistics (2019) Consumer Price Index - All Urban Consumers, U.S. City Average. All Items. 1982-84=100. http://data.bls.gov/timeseries/CUUR0000SA0?data_tool=Xgtable.
   (D) 2018 MHI in 2019 Dollar = 2018 MHI in 2018 Dollar x 2019 CPI /2018 CPI; 2000 MHI in 2019 Dollar = 2000 MHI in 1999 Dollar x 2019 CPI /1999 CPI.
   (E) Percent Change in Median Household Income (2000-2018) = (2018 MHI in 2019 Dollar - 2000 MHI in 2019 Dollar) / (2000 MHI in 2019 Dollar).
2. ($1,963/340)/12 = $0.48 (Estimated Monthly User Cost for New Requirements)
3. ($0.48/($62,269/12))100% = 0.009% (New Sampling Only)
4. ($21.98/($62,269/12))100% = 0.424% (Total User Cost)
5. (A) Total Population in 2018: United States Census Bureau. 2014-2018 American Community Survey 5-Year Estimates, Table B01003: Total Population - Universe: Total Population. https://data.census.gov/cedsci/table?q=B010003%20population&tid=ACSDT5Y2018.B01003&vintage=2018.
   (B) Total Population in 2000: (1) 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. https://www.census.gov/prod/cen2000/phc-1-1-pt1.pdf.
   (2) 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. Place of Birth, Residence in 1995, and Language: 2000, Washington, DC. http://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf.
   (C) Percent Change in Population (2000-2018) = (Total Population in 2018 - Total Population in 2000) / (Total Population in 2000).
6. (A) Median Age in 2018: United States Census Bureau. 2014-2018 American Community Survey 5-Year Estimates, Table B01002: Median Age by Sex - Universe: Total population. https://data.census.gov/cedsci/table?q=B01002&tid=ACSDT5Y2018.B01002&vintage=2018.
   (B) Median Age in 2000: (1) 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.
   (2) 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. Place of Birth, Residence in 1995, and Language: 2000, Washington, DC. http://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf.
   (C) Change in Median Age in Years (2000-2018) = (Median Age in 2018 - Median Age in 2000).
7. United States Census Bureau. 2014-2018 American Community Survey 5-Year Estimates, B23025: Employment Status for the Population 16 Years and Over - Universe: Population 16 years and Over. https://data.census.gov/cedsci/table?q=B23025&tid=ACSDT5Y2018.B23025.
8. United States Census Bureau. 2014-2018 American Community Survey 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months. https://data.census.gov/cedsci/table?q=S1701&tid=ACSST5Y2018.S1701.
9. United States Census Bureau. 2014-2018 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. https://data.census.gov/cedsci/table?q=B22003&tid=ACSDT5Y2018.B22003.

# 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.

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 28th day of the month following the end of the reporting period.

## 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.
   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 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

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 permittees 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.

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.

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
MAY 1, 2013

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

# STANDARD CONDITIONS FOR NPDES PERMITS
# ISSUED BY
# THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
# MISSOURI CLEAN WATER COMMISSION
# August 1, 2019

## 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 limted 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.
   a. 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.
   b. Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
   c. 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[1]).

[1] Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volitalization 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 outstandingstate 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 mthods or technology refletive 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 included the use of methods or technology refletive 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:
        (Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).
        [1] Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volitalization 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 ≥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 ≥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[1] | Priority Pollutants[2] |
| 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 |

[1] 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.

[2] 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 19th 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.

29828

RECEIVED
APR 30 2018
Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

# FORM B2 – APPLICATION FOR AN OPERATING PERMIT FOR FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY

| FOR AGENCY USE ONLY | |
|---|---|
| CHECK NUMBER | |
| DATE RECEIVED: 4-30-18 | FEE SUBMITTED: -0- D.S. |

## PART A – BASIC APPLICATION INFORMATION

**1. THIS APPLICATION IS FOR:**

- ☐ An operating permit for a new or unpermitted facility. Construction Permit # _____
  (Include completed Antidegradation Review or request to conduct an Antidegradation Review, see instructions)
- ☐ An operating permit renewal: Permit #MO- 0022918 Expiration Date 10/31/2018
- ☐ An operating permit modification: Permit #MO-_____ Reason: _____

**1.1** Is the appropriate fee included with the application (see instructions for appropriate fee)? ☐ YES ☐ NO

**2. FACILITY**

| NAME | TELEPHONE NUMBER WITH AREA CODE |
|---|---|
| Orrick Municipal Lagoon | 816-770-3607 |

| ADDRESS (PHYSICAL) | CITY | STATE | ZIP CODE |
|---|---|---|---|
| Z Highway | Orrick | MO | 64077 |

**2.1** LEGAL DESCRIPTION (Facility Site): NE ¼, SE ¼, ¼, Sec. 26 , T 29 , R — COUNTY: RAY

**2.2** UTM Coordinates Easting (X): 3911461 Northing (Y): 09407165
*For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)*

**2.3** Name of receiving stream: Kenny Creek

**2.4** Number of Outfalls: wastewater outfalls, stormwater outfalls, instream monitoring sites

**3. OWNER**

| NAME | EMAIL ADDRESS | TELEPHONE NUMBER WITH AREA CODE |
|---|---|---|
| City of Orrick | daleorrickpw@yahoo.com | 816-496-5512 |

| ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 207 W S Front Street | Orrick | Mo | 64077 |

**3.1** Request review of draft permit prior to Public Notice? ☑ YES ☐ NO

**3.2** Are you a Publically Owned Treatment Works (POTW)? ☐ YES ☑ NO
If yes, is the Financial Questionnaire attached? ☐ YES ☑ NO

**3.3** Are you a Privately Owned Treatment Facility? ☑ YES ☐ NO

**3.4** Are you a Privately Owned Treatment Facility regulated by the Public Service Commission (PSC)? ☐ YES ☑ NO

**4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.**

| NAME | EMAIL ADDRESS | TELEPHONE NUMBER WITH AREA CODE |
|---|---|---|
| City Of Orrick | deanna.hufford@cityof orrick.o | 816-770-3607 |

| ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 207 W S Front Street | Orrick | Mo | 64077 |

If the Continuing Authority is different than the Owner, include a copy of the contract agreement between the two parties and a description of the responsibilities of both parties within the agreement.

**5. OPERATOR**

| NAME | TITLE | CERTIFICATE NUMBER (IF APPLICABLE) |
|---|---|---|
| Dale Bosley | Supervisor of Public Works | 14127 |

| EMAIL ADDRESS | TELEPHONE NUMBER WITH AREA CODE |
|---|---|
| daleorrickpw@yahoo.com | 816-496-5512 |

**6. FACILITY CONTACT**

| NAME | TITLE |
|---|---|
| Roger Thomas / Deanna Hufford / Dale Bosley | Mayor / City Clerk / Chief operator |

| EMAIL ADDRESS | TELEPHONE NUMBER WITH AREA CODE |
|---|---|
| daleorrickpw@yahoo.com | 816-496-5512 816-770-3607 |

| ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 207 W S Front Street | Orrick | Mo | 64077 |

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APR 30 2018
Water Protection Program
JS. 4-30-18

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

# FORM B2 – APPLICATION FOR OPERATING PERMIT FOR FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY

| FACILITY NAME | |
|---|---|
| City Of Orrick, Mo | |
| PERMIT NO. | COUNTY |
| MO0022918 | Ray |

## APPLICATION OVERVIEW

Form B2 has been developed in a modular format and consists of Parts A, B and C and a Supplemental Application Information (Parts D, E, F and G) packet. All applicants must complete Parts A, B and C. Some applicants must also complete parts of the Supplemental Application Information packet. The following items explain which parts of Form B2 you must complete. Submittal of an incomplete application may result in the application being returned.

## BASIC APPLICATION INFORMATION

A. Basic application information for all applicants. All applicants must complete Part A.

B. Additional application information for all applicants. All applicants must complete Part B.

C. Certification. All applicants must complete Part C.

## SUPPLEMENTAL APPLICATION INFORMATION

D. Expanded Effluent Testing Data. A treatment works that discharges effluent to surface water of the United States and meets one or more of the following criteria must complete *Part D - Expanded Effluent Testing Data*:

1. Has a design flow rate greater than or equal to 1 million gallons per day.
2. Is required to have or currently has a pretreatment program.
3. Is otherwise required by the permitting authority to provide the information.

E. Toxicity Testing Data. A treatment works that meets one or more of the following criteria must complete *Part E - Toxicity Testing Data*:

1. Has a design flow rate greater than or equal to 1 million gallons per day.
2. Is required to have or currently has a pretreatment program.
3. Is otherwise required by the permitting authority to provide the information.

F. Industrial User Discharges and Resource Conservation and Recovery Act / Comprehensive Environmental Response, Compensation and Liability Act Wastes. A treatment works that accepts process wastewater from any significant industrial users, also known as SIUs, or receives a Resource Conservation and Recovery Act or CERCLA wastes must complete *Part F - Industrial User Discharges and Resource Conservation and Recovery Act /CERCLA Wastes*.

SIUs are defined as:

1. All Categorical Industrial Users, or CIUs, subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations 403.6 and 40 Code of Federal Regulations 403.6 and 40 CFR Chapter 1, Subchapter N.
2. Any other industrial user that meets one or more of the following:
   - i. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions).
   - ii. Contributes a process waste stream that makes up five percent or more of the average dry weather hydraulic or organic capacity of the treatment plant.
   - iii. Is designated as an SIU by the control authority.
   - iv. Is otherwise required by the permitting authority to provide the information.

G. Combined Sewer Systems. A treatment works that has a combined sewer system must complete *Part G - Combined Sewer Systems*.

**ALL APPLICANTS MUST COMPLETE PARTS A, B and C**

| FACILITY NAME | PERMIT NO. | OUTFALL NO. |
|---|---|---|
| Orrick Municipal Lagoon | MO-0022918 | 001-POTW-4952 |

## PART A – BASIC APPLICATION INFORMATION

### 7. FACILITY INFORMATION (continued)

**7.2 Topographic Map.** Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information.

a. The area surrounding the treatment plant, including all unit processes.
b. The location of the downstream landowner(s). (See Item 10.)
c. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.
d. The actual point of discharge.
e. Wells, springs, other surface water bodies and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.
f. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.
g. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, or disposed.

| 7.3 Facility SIC Code: | Discharge SIC Code: |
|---|---|
| 4952 | 4952 |

**7.4** Number of people presently connected or population equivalent (P.E.): 745 Design P.E. 1184

**7.5** Connections to the facility:

Number of units presently connected:

Homes 278 Trailers 22 Apartments 25 Other (including industrial) _____

Number of Commercial Establishments: 13

| 7.6 Design Flow | Actual Flow |
|---|---|
| 118400 | 10512 |

**7.7** Will discharge be continuous through the year? Yes ☑ No ☐

Discharge will occur during the following months: How many days of the week will discharge occur?

7 day a week

**7.8** Is industrial wastewater discharged to the facility? Yes ☐ No ☑

If yes, describe the number and types of industries that discharge to your facility. Attach sheets as necessary

Refer to the APPLICATION OVERVIEW to determine whether additional information is needed for Part F.

| | | | |
|---|---|---|---|
| 7.9 | Does the facility accept or process leachate from landfills?: | Yes ☐ | No ☑ |
| 7.10 | Is wastewater land applied?<br>If yes, is Form I attached? | Yes ☐<br>Yes ☐ | No ☑<br>No ☐ |
| 7.11 | Does the facility discharge to a losing stream or sinkhole? | Yes ☐ | No ☑ |
| 7.12 | Has a wasteload allocation study been completed for this facility? | Yes ☐ | No ☑ |

### 8. LABORATORY CONTROL INFORMATION

LABORATORY WORK CONDUCTED BY PLANT PERSONNEL

| | | |
|---|---|---|
| Lab work conducted outside of plant. | Yes ☑ | No ☐ |
| Push–button or visual methods for simple test such as pH, settleable solids. | Yes ☑ | No ☐ |
| Additional procedures such as Dissolved Oxygen, Chemical Oxygen Demand, Biological Oxygen Demand, titrations, solids, volatile content. | Yes ☐ | No ☑ |
| More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc. | Yes ☐ | No ☑ |
| Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph. | Yes ☐ | No ☑ |

| FACILITY NAME | PERMIT NO. MO- | OUTFALL NO. |
|---|---|---|

**PART A – BASIC APPLICATION INFORMATION**

**7. FACILITY INFORMATION**

**7.1 Process Flow Diagram or Schematic.** Provide a diagram showing the processes of the treatment plant. Show all of the treatment units, including disinfection (e.g. – Chlorination and Dechlorination), influents, and outfalls. Specify where samples are taken. Indicate any treatment process changes in the routing of wastewater during dry weather and peak wet weather. Include a brief narrative description of the diagram.
Attach sheets as necessary.

| FACILITY NAME | PERMIT NO. | OUTFALL NO. |
|---|---|---|
| City of Orrick | MO- 0022918 | #001 |

**PART A – BASIC APPLICATION INFORMATION**

**9. SLUDGE HANDLING, USE AND DISPOSAL**

**9.1** Is the sludge a hazardous waste as defined by 10 CSR 25? Yes ☐ No ☑

**9.2** Sludge production (Including sludge received from others): Design Dry Tons/Year 1776 Actual Dry Tons/Year

**9.3** Sludge storage provided: _____ Cubic feet; _____ Days of storage; _____ Average percent solids of sludge;

☐ No sludge storage is provided. ☑ Sludge is stored in lagoon.

**9.4** Type of storage:
☐ Holding Tank ☐ Basin ☐ Concrete Pad ☐ Building ☑ Lagoon ☐ Other (Describe) _____

**9.5** Sludge Treatment:
☐ Anaerobic Digester ☐ Aerobic Digester ☐ Storage Tank ☐ Air or Heat Drying ☐ Lime Stabilization ☐ Composting ☑ Lagoon ☐ Other (Attach Description)

**9.6** Sludge use or disposal:
☐ Land Application ☐ Contract Hauler ☐ Hauled to Another Treatment Facility ☐ Solid Waste Landfill
☐ Surface Disposal (Sludge Disposal Lagoon, Sludge Held For More Than Two Years) ☐ Incineration
☑ Other (Attach Explanation Sheet) STORE IN LAGOON

**9.7** Person responsible for hauling sludge to disposal facility:
☐ By Applicant ☐ By Others (complete below) NA

| NAME | EMAIL ADDRESS | | |
|---|---|---|---|
| N/A | | | |
| ADDRESS | CITY | STATE | ZIP CODE |
| | | | |
| CONTACT PERSON | TELEPHONE NUMBER WITH AREA CODE | PERMIT NO. | |
| | | MO- | |

**9.8** Sludge use or disposal facility:
☐ By Applicant ☐ By Others (Complete below)

| NAME | EMAIL ADDRESS | | |
|---|---|---|---|
| N/A | | | |
| ADDRESS | CITY | STATE | ZIP CODE |
| | | | |
| CONTACT PERSON | TELEPHONE NUMBER WITH AREA CODE | PERMIT NO. | |
| | | MO- | |

**9.9** Does the sludge or biosolids disposal comply with Federal Sludge Regulation 40 CFR 503?
☐ Yes ☐ No (Explain)

**END OF PART A**

| FACILITY NAME | PERMIT NO. | OUTFALL NO. |
|---|---|---|
| City of Orrick | MO-002918 | 001 |

## PART B – ADDITIONAL APPLICATION INFORMATION

### 10. COLLECTION SYSTEM

**10.1** Length of sanitary sewer collection system in miles
+or- 5miles 6 miles

**10.2** Does significant infiltration occur in the collection system? ☑ Yes ☐ No
If yes, briefly explain any steps underway or planned to minimize inflow and infiltration:

Smoke Test planning in the spring of 2018

### 11. BYPASSING

Does any bypassing occur anywhere in the collection system or at the treatment facility? Yes ☐ No ☑
If yes, explain:

### 12. OPERATION AND MAINTENANCE PERFORMED BY CONTRACTOR(S)

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of the contractor?
Yes ☐ No ☑
If Yes, list the name, address, telephone number and status of each contractor and describe the contractor's responsibilities. (Attach additional pages if necessary.)

| NAME | |
|---|---|
| MAILING ADDRESS | |
| TELEPHONE NUMBER WITH AREA CODE | EMAIL ADDRESS |
| RESPONSIBILITIES OF CONTRACTOR | |

### 13. SCHEDULED IMPROVEMENTS AND SCHEDULES OF IMPLEMENTATION

Provide information about any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses for each.

| FACILITY NAME | PERMIT NO. | OUTFALL NO. |
|---|---|---|
| City of Orrick Lagoon | MO-0022918 | #001 |

**PART B – ADDITIONAL APPLICATION INFORMATION**

**14. EFFLUENT TESTING DATA**

Applicants must provide effluent testing data for the following parameters. Provide the indicated effluent data **for each outfall through which effluent is discharged**. Do not include information of combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least **three samples** and must be no more than four and one-half years apart.

Outfall Number

| PARAMETER | MAXIMUM DAILY VALUE | | AVERAGE DAILY VALUE | | |
|---|---|---|---|---|---|
| | Value | Units | Value | Units | Number of Samples |
| pH (Minimum) | 6.05 | S.U. | 7.66 | S.U. | 9 |
| pH (Maximum) | 12.35 | S.U. | 9.374 | S.U. | 9 |
| Flow Rate | .007620 | MGD | 0.007620 | MGD | 7 |

*For pH report a minimum and a maximum daily value

| POLLUTANT | | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML/MDL |
|---|---|---|---|---|---|---|---|---|
| | | Conc. | Units | Conc. | Units | Number of Samples | | |
| Conventional and Nonconventional Compounds | | | | | | | | |
| BIOCHEMICAL OXYGEN DEMAND (Report One) | $BOD_5$ | 23.7 | mg/L | | mg/L | 9 | | |
| | $CBOD_5$ | | mg/L | | mg/L | | | |
| E. COLI | | 6.1 | #/100 mL | | #/100 mL | 8 | | |
| TOTAL SUSPENDED SOLIDS (TSS) | | 32.2 | mg/L | | mg/L | 9 | | |
| AMMONIA (as N) | | 0.75 | mg/L | | mg/L | 7 | | |
| CHLORINE* (TOTAL RESIDUAL, TRC) | | | mg/L | | mg/L | | | |
| DISSOLVED OXYGEN | | 9.63 | mg/L | | mg/L | 8 | | |
| OIL and GREASE | | 0875 | mg/L | | mg/L | 7 | | |
| OTHER | | | mg/L | | mg/L | | | |

*Report only if facility chlorinates

**END OF PART B**

| FACILITY NAME | PERMIT NO. | OUTFALL NO. |
|---|---|---|
| City of Orrick Lagoon | MO- 0022918 | #001 |

**PART C – CERTIFICATION**

**15. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM**

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally-consistent set of data. **One of the following must be checked in order for this application to be considered complete.** Please visit http://dnr.mo.gov/env/wpp/edmr.htm to access the Facility Participation Package.

☑ - You have completed and submitted with this permit application the required documentation to participate in the eDMR system.

☐ - You have previously submitted the required documentation to participate in the eDMR system and/or you are currently using the eDMR system.

☐ - You have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.

**16. CERTIFICATION**

All applicants must complete the Certification Section. This certification must be signed by an officer of the company or city official. All applicants must complete all applicable sections as explained in the Application Overview. By signing this certification statement, applicants confirm that they have reviewed the entire form and have completed all sections that apply to the facility for which this application is submitted.

**ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.**

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 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.

| PRINTED NAME | OFFICIAL TITLE (MUST BE AN OFFICER OF THE COMPANY OR CITY OFFICIAL) |
|---|---|
| Roger Thomas, Dale Bosley | Mayor, Supervisor of Pubic Works |

SIGNATURE

TELEPHONE NUMBER WITH AREA CODE
816-770-3607

DATE SIGNED

Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

Send Completed Form to:

Department of Natural Resources
Water Protection Program
ATTN: NPDES Permits and Engineering Section
P.O. Box 176
Jefferson City, MO 65102-0176

**END OF PART C**
**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH PARTS OF FORM B2 YOU MUST COMPLETE.**

Do not complete the remainder of this application, unless at least one of the following statements applies to your facility:

1. Your facility design flow is equal to or greater than 1,000,000 gallons per day.
2. Your facility is a pretreatment treatment works.
3. Your facility is a combined sewer system.

Submittal of an incomplete application may result in the application being returned. Permit fees for returned applications shall be forfeited. Permit fees for applications being processed by the department that are withdrawn by the applicant shall be forfeited.

United States
Environmental Protection
Agency

# Wastewater Technology Fact Sheet

## Facultative Lagoons

### DESCRIPTION

Facultative waste stabilization ponds, sometimes referred to as lagoons or ponds, are frequently used to treat municipal and industrial wastewater in the United States. The technology associated with facultative lagoons has been in widespread use in the United States for at least 90 years, with more than 7,000 facultative lagoons in operation today. These earthen lagoons are usually 1.2 to 2.4 m (4 to 8 feet) in depth and are not mechanically mixed or aerated. The layer of water near the surface contains dissolved oxygen due to atmospheric reaeration and algal respiration, a condition that supports aerobic and facultative organisms. The bottom layer of the lagoon includes sludge deposits and supports anaerobic organisms. The intermediate anoxic layer, termed the facultative zone, ranges from aerobic near the top to anaerobic at the bottom. These layers may persist for long periods due to temperature-induced water-density variations. Inversions can occur in the spring and fall when the surface water layer may have a higher density than lower layers due to temperature fluctuations. This higher density water sinks during these unstable periods, creates turbidity, and produces objectionable odors.

The presence of algae in the aerobic and facultative zones is essential to the successful performance of facultative ponds. In sunlight, the algal cells utilize $CO_2$ from the water and release $O_2$ produced from photosynthesis. On warm, sunny days, the oxygen concentration in the surface water can exceed saturation levels. Conversely, oxygen levels are decreased at night. In addition, the pH of the near surface water can exceed 10 due to the intense use of $CO_2$ by algae, creating conditions favorable for ammonia removal via volatilization. This photosynthetic activity occurs on a diurnal basis, causing both oxygen and pH levels to shift from a maximum in daylight hours to a minimum at night.

The oxygen, produced by algae and surface reaeration, is used by aerobic and facultative bacteria to stabilize organic material in the upper layer of water. Anaerobic fermentation is the dominant activity in the bottom layer in the lagoon. In cold climates, oxygenation and fermentation reaction rates are significantly reduced during the winter and early spring and effluent quality may be reduced to the equivalent of primary effluent when an ice cover persists on the water surface. As a result, many states in the northern United States and Canada prohibit discharge from facultative lagoons during the winter.

Although the facultative lagoon concept is land intensive, especially in northern climates, it offers a reliable and easy-to-operate process that is attractive to small, rural communities.

#### Common Modifications

A common operational modification to facultative lagoons is the "controlled discharge" mode, where pond discharge is prohibited during the winter months in cold climates and/or during peak algal growth periods in the summer. In this approach, each cell in the system is isolated, then discharged sequentially. A similar modification, the “hydrograph controlled release” (HCR), retains liquid in the pond until flow volume and conditions in the receiving stream are adequate for discharge.

A recently developed physical modification uses plastic curtains, supported by floats and anchored to the bottom, to divide lagoons into multiple cells and/or to serve as baffles to improve hydraulic conditions. Another recent development uses a floating plastic grid to support the growth of duckweed (*Lemna* sp.) plants on the surface of the final cell(s) in the lagoon system, which restricts the penetration of light and thus reduces algae (with

sufficient detention time ≥ 20 days), improving the final effluent quality.

**APPLICABILITY**

The concept is well suited for rural communities and industries where land costs are not a limiting factor. Facultative lagoons can be used to treat raw, screened, or primary settled municipal wastewater and biodegradable industrial wastewaters.

**ADVANTAGES AND DISADVANTAGES**

Some advantages and disadvantages of facultative lagoons are listed below:

**Advantages**

Moderately effective in removing settleable solids, BOD, pathogens, fecal coliform, and ammonia.

Easy to operate.

Require little energy, with systems designed to operate with gravity flow.

The quantity of removed material will be relatively small compared to other secondary treatment processes.

**Disadvantages**

Settled sludges and inert material require periodic removal.

Difficult to control or predict ammonia levels in effluent.

Sludge accumulation will be higher in cold climates due to reduced microbial activity.

Mosquitos and similar insect vectors can be a problem if emergent vegetation is not controlled.

Requires relatively large areas of land.

Strong odors occur when the aerobic blanket disappears and during spring and fall lagoon turnovers.

Burrowing animals may be a problem.

**DESIGN CRITERIA**

Waste stabilization pond systems are simplistic in appearance, however, the reactions are as complicated as any other treatment process. Typical equipment used in facultative lagoons includes lining systems to control seepage to groundwater (if needed), inlet and outlet structures, hydraulic controls, floating dividers, and baffles. Many existing facultative lagoons are large, single-cell systems with the inlet constructed near the center of the cell. This configuration can result in short-circuiting and ineffective use of the design volume of the system. A multiple-cell system with at least three cells in series is recommended, with appropriate inlet and outlet structures to maximize effectiveness of the design volume. Most states have design criteria that specify the areal organic loading (kg/ha/d or lbs/acre/d) and/or the hydraulic residence time. Typical organic loading values range from 15 to 80 kg/ha/d (13 to 71 lbs/acre/d). Typical detention times range from 20 to 180 days depending on the location. Detention times can approach 200 days in northern climates where discharge restrictions prevail. Effluent biochemical oxygen demand (BOD) ≤ 30 mg/L can usually be achieved, while effluent TSS may range from ≤ 30 mg/L to more than 100 mg/L, depending on the algal concentrations and design of discharge structures.

A number of empirical and rational models exist for the design of simple and series constructed facultative lagoons. These include first-order plug flow, first-order complete mix, and models proposed by Gloyna, Marais, Oswald, and Thirumurthi. None of these has been shown to be clearly superior to the others. All provide a reasonable design as long as the basis for the formula is understood, proper parameters are selected, and the hydraulic detention and sludge retention characteristics of the system are known. This last element is critical because short circuiting in a poorly designed cell can result in

detention time of 40 percent or less than the theoretical design value.

## PERFORMANCE

Overall, facultative lagoon systems are simple to operate, but only partially reliable in performance. $BOD_5$ removal can range up to 95 percent. However, the TSS range may exceed 150 mg/L. Removal of ammonia nitrogen can be significant (up to 80 percent), depending on temperature, pH, and detention time in the system. However, the removal cannot be sustained over the winter season. Due to precipitation reactions occurring simultaneously with the daily high pH (alkaline) conditions in the lagoon, approximately 50 percent phosphorus removal can be expected. Removal of pathogens and coliforms can be effective, depending on temperature and detention time.

### Limitations

Limitations may include the inability of the process to meet a 30 mg/L limit for TSS due to the presence of algae in the effluent, particularly during warm weather, and not meeting effluent criteria consistently throughout the year. In cold climates, low temperatures and ice formation will limit process efficiency during the winter. Odors may be a problem in the spring and fall during periods of excessive algal blooms and unfavorable weather conditions.

## OPERATION AND MAINTENANCE

Most facultative lagoons are designed to operate by gravity flow. The system is not maintenance intensive and power costs are minimal because pumps and other electrically operated devices may not be required. Although some analytical work is essential to ensure proper operation, an extensive sampling and monitoring program is usually not necessary. In addition, earthen structures used as impoundments must be inspected for rodent damage.

## COSTS

Cost information for facultative lagoons varies significantly. Construction costs include cost of the land, excavation, grading, berm construction, and inlet and outlet structures. If the soil is permeable, an additional cost for lining the lagoon should be considered.

## REFERENCES

### Other Related Fact Sheets

Other EPA Fact Sheets can be found at the following web address:

http://ww.epa.gov/owm/mtb/mtbfact.htm


1. Middlebrooks, E.J., et al., 1982. *Wastewater Stabilization Lagoon Design, Performance and Upgrading*, McMillan Publishing Co., New York, NY.

2. Pano, A. and Middlebrooks, E.T., 1982. Ammonia Nitrogen Removal in Facultative Wastewater Stabilization Ponds. Water Pollution Control Federation Journal, 54 (4) 344-351.

3. Reed, S.C., et al., 1995, 2nd Ed. *Natural Systems for Waste Management and Treatment*, McGraw Hill Book Co., New York, NY.

4. Reed, S.C., 1985. *Nitrogen Removal in Wastewater Stabilization Ponds*, Water Pollution Control Federation Journal. 57(1)39-45.

5. U.S. EPA, 1983. *Design Manual - Municipal Wastewater Stabilization Ponds*, EPA-625/1-83-015, US EPA CERI. Cincinnati, OH.

6. WPCF, 1990. MOP FD-16, *Natural Systems for Wastewater Treatment*, Water Pollution Control Federation, Alexandria, VA.

## ADDITIONAL INFORMATION

Richard H. Bowman, P.E.
West Slope Supervisor
Colorado Department of Public Health and Environment
Water Quality Control Division
222 South 6th Street, Room 232
Grand Junction, CO 81502

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Austin, TX 78701

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Environmental Engineering Consultant
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Lafayette, CO 80026-9392

Gordon F. Pearson
Vice President
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B-1 Oak Park Plaza
Hilton Head, SC 29925

Sherwood Reed
Principal
Environmental Engineering Consultants (EEC)
50 Butternut Road
Norwich, VT 05055

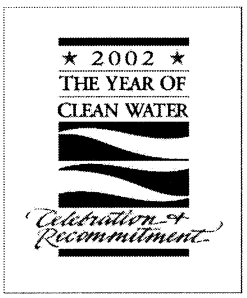
Leroy C. Reid, Jr., Ph.D
1273 Annapolis Drive
Anchorage, AK 99508-4307



Office of Water
EPA 832-F-02-014
September 2002

For more information contact:

Municipal Technology Branch
U.S. EPA
1200 Pennsylvania Ave., NW
Mail Code 4201M

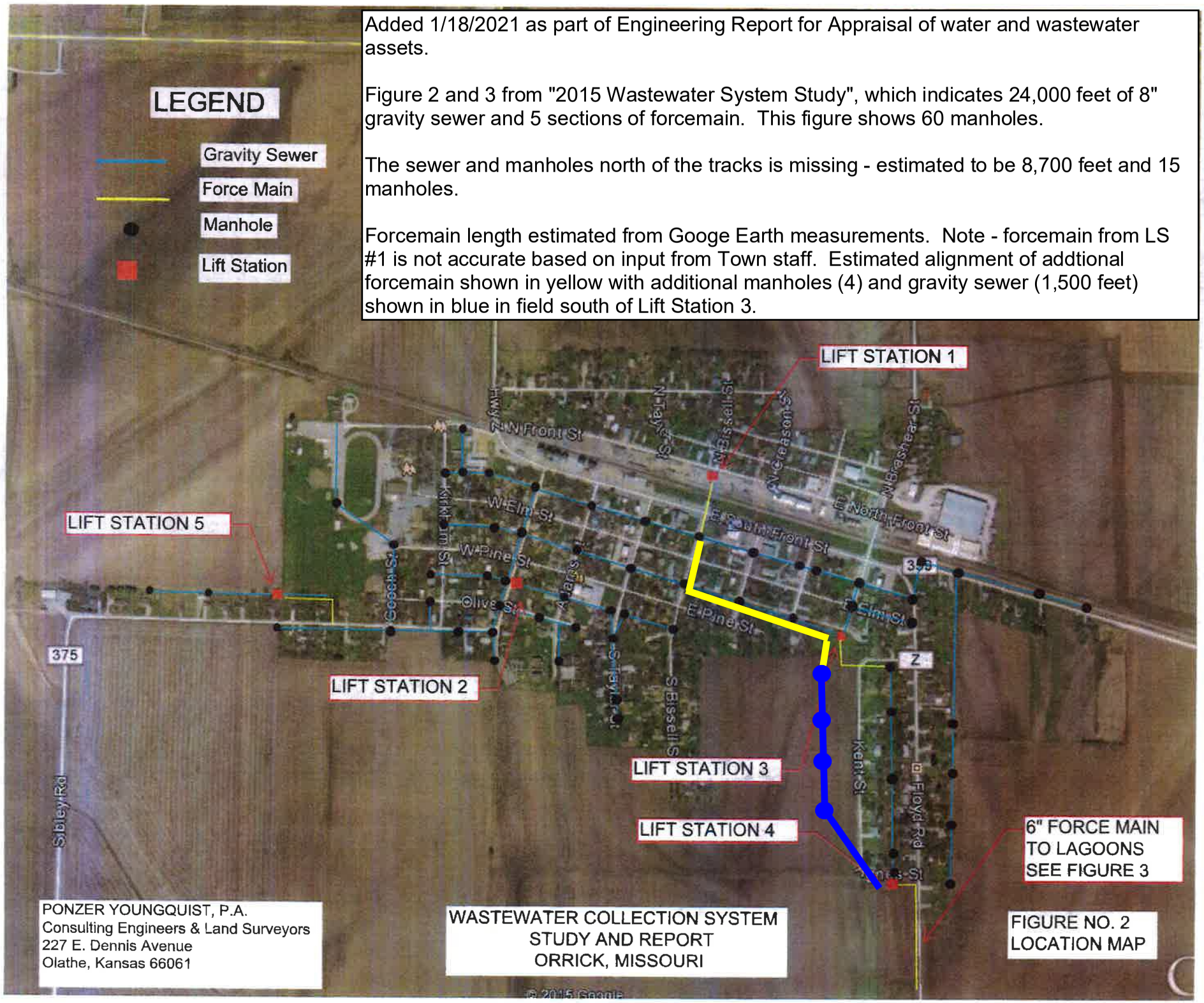


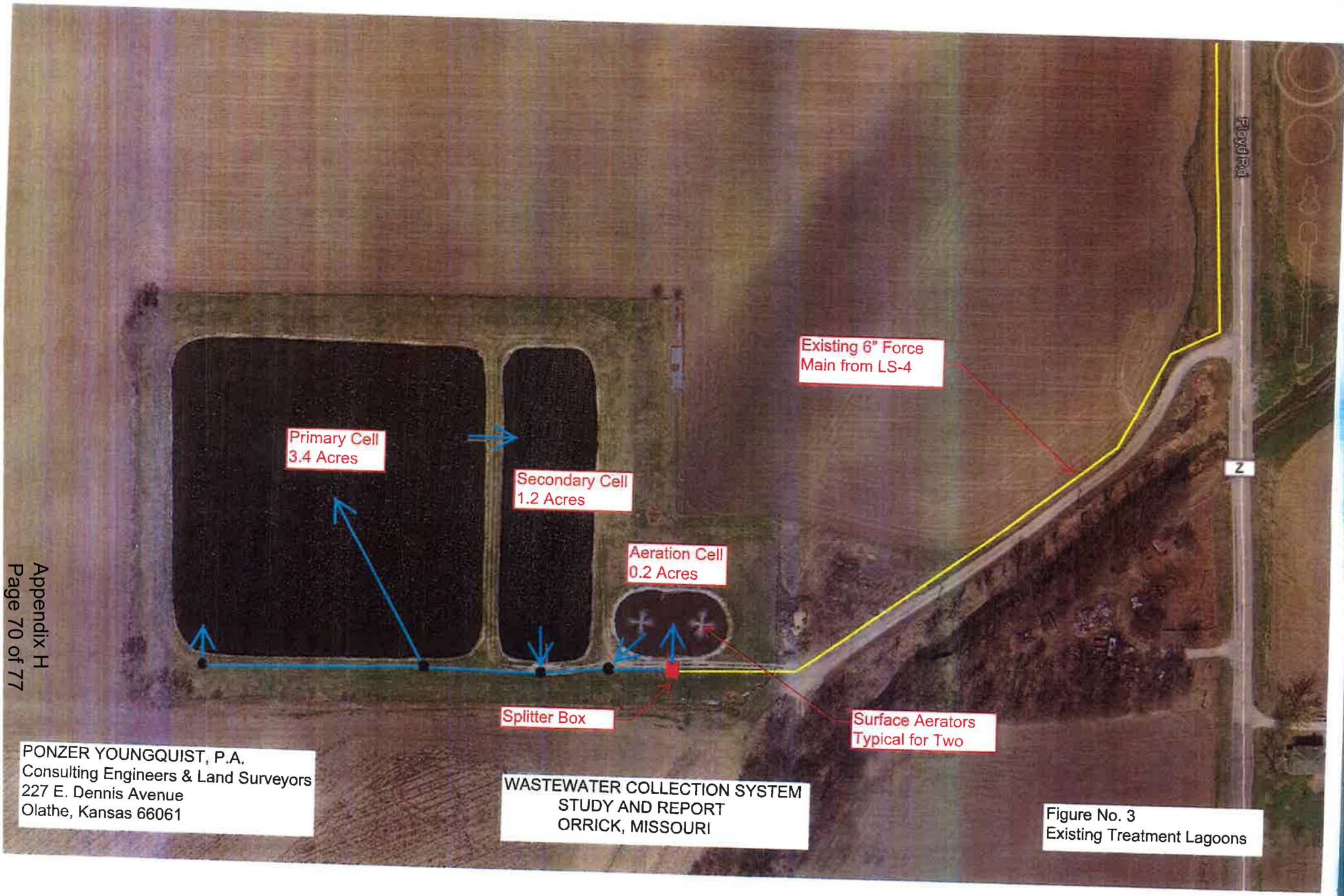
Added 1/18/2021 as part of Engineering Report for Appraisal of water and wastewater assets.

Figure 2 and 3 from "2015 Wastewater System Study", which indicates 24,000 feet of 8" gravity sewer and 5 sections of forcemain. This figure shows 60 manholes.

The sewer and manholes north of the tracks is missing - estimated to be 8,700 feet and 15 manholes.

Forcemain length estimated from Googe Earth measurements. Note - forcemain from LS #1 is not accurate based on input from Town staff. Estimated alignment of addtional forcemain shown in yellow with additional manholes (4) and gravity sewer (1,500 feet) shown in blue in field south of Lift Station 3.






PONZER YOUNGQUIST, P.A.
Consulting Engineers & Land Surveyors
227 E. Dennis Avenue
Olathe, Kansas 66061

WASTEWATER COLLECTION SYSTEM
STUDY AND REPORT
ORRICK, MISSOURI

Figure No. 3
Existing Treatment Lagoons

# Orrick, MO
## Asset Value Report
## Depreciated Value

| Asset Description | Year Installed | Estimated Installation Cost 2021 | Age (2020) | Depreciation Period [1] | Depreciation [2] | Depreciated Value [3] |
|---|---|---|---|---|---|---|
| Meter Vault and Telemetry | 2000 | $ 155,700.00 | 21 | 35 | $ 93,420.00 | $ 62,280.00 |
| Elevated Tank | 2000 | $ 479,875.00 | 21 | 42 | $ 239,937.50 | $ 239,937.50 |
| Water Main-1955 | 1955 | $ 1,699,965.00 | 66 | 50 | $ 2,243,953.80 | $ - |
| Water Main-2000 | 2000 | $ 127,490.00 | 21 | 50 | $ 53,545.80 | $ 73,944.20 |
| Hydrants | 1955 | $ 140,000.00 | 66 | 50 | $ 184,800.00 | $ - |
| Water Services and Meters | 1955 | $ 510,000.00 | 66 | 35 | $ 961,714.29 | $ - |
| Total Water Assets | | $ 3,113,030.00 | | | | $ 376,161.70 |
| | | | | | | |
| Wastewater Treatment Plant | 1959 | $ 296,000.00 | 62 | 40 | $ 458,800.00 | $ - |
| Wastewater Treatment Plant - New Aerators | 2020 | $ 7,000.00 | 1 | 10 | $ 700.00 | $ 6,300.00 |
| Lift Station #1 - Original Installation | 1960 | $ 75,000.00 | 61 | 10 | $ 457,500.00 | $ - |
| Lift Station #1 - Rebuild | 2008 | $ 15,000.00 | 13 | 10 | $ 19,500.00 | $ - |
| Lift Station #1 - Electrical Improvements | 2015 | $ 10,000.00 | 6 | 10 | $ 6,000.00 | $ 4,000.00 |
| Lift Station #2 - Original Installation | 1969 | $ 75,000.00 | 52 | 10 | $ 390,000.00 | $ - |
| Lift Station #2 - Electrical Improvements | 2015 | $ 10,000.00 | 6 | 10 | $ 6,000.00 | $ 4,000.00 |
| Lift Station #3 | 2015 | $ 170,000.00 | 6 | 10 | $ 102,000.00 | $ 68,000.00 |
| Lift Station #4 - Original Installation | 1969 | $ 100,000.00 | 52 | 10 | $ 520,000.00 | $ - |
| Lift Station #4 - Electrical Improvements | 2015 | $ 10,000.00 | 6 | 10 | $ 6,000.00 | $ 4,000.00 |
| Lift Station #5 - Original Installation | 2005 | $ 75,000.00 | 16 | 10 | $ 120,000.00 | $ - |
| Lift Station #5 - Electrical Improvements | 2015 | $ 10,000.00 | 6 | 10 | $ 6,000.00 | $ 4,000.00 |
| Sewer | 1960 | $ 2,211,075.00 | 61 | 50 | $ 2,697,511.50 | $ - |
| Manholes | 1960 | $ 276,500.00 | 61 | 50 | $ 337,330.00 | $ - |
| Service Laterals | 1960 | $ 102,000.00 | 61 | 50 | $ 124,440.00 | $ - |
| Total Wastewater Assets | | $ 3,442,575.00 | | | | $ 90,300.00 |

Note 1 - Based on Missouri PSC Rate Case Dockets WR-2015-0138 Village Greens Water Company; WR-2016-0169 Woodland Manor Water Company; WR-2015-0104 Spokane Highlands Water Company; SR-2014-0105 Terre Du Lac Utility Company; SR-2014-0068 P.C.B., Inc.; and SR-2013-0435 Rogue Creek Sewer.

Note 2 - Depreciation = Age/Depreciation Period X Estimated Installation Cost

Note 3 - Depreciated Value = Estimated Installation Cost - Depreciation

# VILLAGE GREENS WATER COMPANY
## SCHEDULE of DEPRECIATION RATES
## (WATER Class D)
## WR-2015-0138 Attachment D

| NARUC USOA ACCOUNT NUMBER | ACCOUNT DESCRIPTION | DEPRECIATION RATE | AVERAGE SERVICE LIFE (YEARS) | NET SALVAGE |
|---|---|---|---|---|
| | **Source of Supply** | | | |
| 311 | Structures & Improvements | 2.5% | 44 | -10% |
| 314 | Wells & Springs | 2.0% | 55 | -8% |
| | **Pumping Plant** | | | |
| 321 | Structures & Improvements | 2.5% | 44 | -10% |
| 325.1 | Submersible Pumping Equipment | 10.0% | 12 | -20% |
| | **Water Treatment Plant** | | | |
| 331 | Structures & Improvements | 2.5% | 44 | -10% |
| 332 | Water Treatment Equipment | 2.9% | 35 | 0% |
| | **Transmission and Distribution** | | | |
| 342 | Distribution Reservoirs & Standpipes | 2.5% | 42 | -5% |
| 343 | Transmission & Distribution Mains | 2.0% | 50 | 0% |
| 345 | Customer Services | 2.5% | 40 | 0% |
| 346.1 | Customer Meters, Plastic (Throw Aways) | 10.0% | 10 | 0% |
| 347 | Customer Meter Pits & Installation | 2.5% | 40 | 0% |
| 348 | Hydrants | 2.0% | 50 | 0% |
| | **General Plant CLASS D** | | | |
| 371 | Structures & Improvements | 2.5% | 40 | 0% |
| 372 | Office Furniture & Equipment | 5.0% | 20 | 0% |
| 372.1 | Office Electronic & Computer Equip. | 14.3% | 7 | 0% |
| 373 | Transportation Equipment | 13.0% | 7 | 9% |
| 379 | Other General Equipment (tools, shop equip., backhoes, trenchers, etc.) | 10.0% | 8.7 | 13% |

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=WR-2015-0138&attach_id=2015030930

*Revised 1/23/2015

ATTACHMENT C

## For Staff Proposed Adoption by Missouri-American Water Company
## WM-2016-0169

**Woodland Manor Water Company**
**SCHEDULE of DEPRECIATION RATES dated 4/1/2013**
**(WATER Class D)**
**WR-2013-0326**

| USOA ACCOUNT NUMBER | ACCOUNT DESCRIPTION | DEPRECIATION RATE | AVERAGE SERVICE LIFE (YEARS) | NET SALVAGE |
|---|---|---|---|---|
| | **Source of Supply** | | | |
| 311 | Structures & Improvements | 2.5% | 44 | -10% |
| 314 | Wells & Springs | 2.0% | 55 | -8% |
| | **Pumping Plant** | | | |
| 321 | Structures & Improvements | 2.5% | 44 | -10% |
| 325 | Electric Pumping Equip. (Plus Generator) | 6.7% | 15 | 0% |
| 328 | Other Pumping Equipment | 5.0% | 20 | 0% |
| | **WaterTreatment Plant** | | | |
| 332 | Water Treatment Equipment | 2.9% | 35 | $0 |
| | **Transmission and Distribution** | | | |
| 342 | Distribution Reservoirs & Standpipes | 2.5% | 42 | -5% |
| 343 | Transmission & Distribution Mains | 2.0% | 50 | 0% |
| 345 | Customer Services | 2.9% | 35 | 0% |
| 346.1 | Customer Meters (Installed after 2012)* | 10.0% | 10 | 0% |
| 346.2 | Bronze Meters and Installs prior 2013 | 3.3% | 30 | 0% |
| 347 | Meter Installations (Meter Pits after 2012) | 2.5% | 40 | 0% |
| 348 | Hydrants | 2.5% | 40 | 0% |
| 349 | Other Transmission & Distribution Plant | 3.3% | 30 | 0% |
| | **General Plant** | | | |
| 372 | Office Equipment & Furniture | 5.0% | 20 | 0% |
| 372.1 | Office Electronic Equipment | 14.3% | 7 | 0% |
| 373 | Transportation Equipment | 13.0% | 7 | 9% |
| 379 | Other General Equipment | 6.7% | 13 | 13% |

Customer Meters (Installed after 2012)* Plus 18 plastic meters installed in 2007

The above recommended depreciation rates are based on Staff's review of the Company's operation and records.

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=WM-2016-0169&attach_id=2016015052

ATTACHMENT C

# SPOKANE HIGHLANDS WATER COMPANY
# DEPRECIATION RATES
## (WATER)
## CASE NO. WR-2015-0104

| ACCOUNT NUMBER | ACCOUNT | DEPRECIATION RATE % | AVERAGE SERVICE LIFE (YEARS) | SALVAGE % |
|---|---|---|---|---|
| 311 | Structures & Improvements | 2.5% | 44 | -10% |
| 314 | Wells & Springs | 2.0% | 55 | -8% |
| 325 | Electric Pumping Equipment | | | |
| 325.1 | Submersible (Well Pump) Equipment | 10.0% | 12 | -20% |
| 325.2 | High Service or Booster Pumps | 2.0% | 7 | 0% |
| 342 | Distribution Reservoirs & Standpipes | 2.5% | 42 | -5% |
| 343 | Transmission & Distribution Mains | 2.0% | 50 | 0% |
| 345 | Services | 2.9% | 35 | 0% |
| 346 | Meters | 2.0% | 10 | 0% |
| 347 | Meter Installations | 1.0% | 50 | 0% |
| 348 | Hydrants | 2.5% | 40 | 0% |
| 372 | Office Furniture & Equipment | 5.0% | 20 | 0% |
| 379 | Other General Equipment | 6.7% | 13 | 13% |

ATTACHMENT C

# Terre Du Lac Utility Company

## DEPRECIATION RATES

## (SEWER)

## SR-2014-0105

| ACCOUNT NUMBER | ACCOUNT DESCRIPTION | DEPRECIATION RATE | AVERAGE SERVICE LIFE (YEARS) | NET SALVAGE |
|---|---|---|---|---|
| 300 | Stipulated Plant | 2.5% | 40 | 0% |
| 311 | Structures and Improvements | 2.5% | 44 | -10% |
| 352.1 | Collection Sewers (Force) | 2.0% | 50 | 0% |
| 352.2 | Collection Sewers (Gravity) | 2.0% | 50 | 0% |
| 353 | Services | 2.0% | 50 | 0% |
| 354 | Flow Measurement Devices | 3.3% | 30 | 0% |
| 362 | Receiving Wells | 5.0% | 26 | -5% |
| 363 | Electric Pumping Equipment | 10.0% | 10 | 0% |
| 371 | Treatment Plant Shed | 2.5% | 44 | -10% |
| 372 | Treatment & Disposal Equipment | 5.0% | 22 | -10% |
| 390 | Structures & Improvements Office/Shop | 2.5% | 44 | -10% |
| 391 | Office Furniture & Equipment | 5.0% | 20 | 0% |
| 391.1 | Electronic Office Equipment | 0.0% | Excessively Accrued | |
| 392 | Transportation Equipment | 13.0% | 7 | 9% |
| 393 | Stores Equipment | 4.0% | 25 | 0% |
| 394 | Tools, Shop, and Garage Equipment | 5.0% | 18 | 10% |
| 395 | Laboratory Equipment | 8.3% | 12 | 0% |
| 396 | Power Operated Equipment | 6.7% | 13 | 13% |
| 397 | Communication Equipment | 3.3% | Over Accrued | |

Reviewed, 1/7/2014. The above are standard small company depreciation rates modified as a result of Staff's investigation of the Company's operation, records, and physical plant, and are dependent on the Company's implementation of the end of test year adjustments to the Company's plant in service and accumulated reserves as shown in the Staff accounting schedules.

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=SR-2014-0105&attach_id=2014014505

# P.C.B., Inc.

## SCHEDULE of DEPRECIATION RATES
## (SEWER Class C & D)
## SR-2014-0068 Attachment D

| ACCOUNT NUMBER | ACCOUNT DESCRIPTION | DEPRECIATION RATE | AVERAGE SERVICE LIFE (YEARS) |
|---|---|---|---|
| | **COLLECTION PLANT** | | |
| 311 | Structures & Improvements | 3.3% | 33 |
| 352.2 | Collection Sewers (Gravity) | 2.0% | 50 |
| 355 | Flow Measurement Devices | 3.3% | 30 |
| | **PUMPING PLANT** | | |
| 362 | Receiving Wells | 4.0% | 26 |
| 363 | Electric Pumping Equipment | 10.0% | 10 |
| | **TREATMENT & DISPOSAL PLANT** | | |
| 372 | Oxidation Lagoons | 4.0% | 40 |
| 373 | Treatment & Disposal Facilities | 5.0% | 22 |
| 375 | Outfall Sewer Lines | 2.0% | 50 |
| | **GENERAL PLANT** | | |
| 391 | Office Furniture & Equipment | 5.0% | 20 |

Reviewed, 1/07/2014. The above are standard small company depreciation rates modified as a result of Staff's investigation of the Company's operation, records, and physical plant, and are dependent on the Company's implementation of the end of test year adjustments to the Company's plant in service and accumulated reserves as shown in the Staff accounting schedules.

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=SR-2014-0068&attach_id=2014016258

**Rogue Creek Sewer**
**Interim Rate Case**
**SR-2013-0435**
**Test Year Ending 12-31-2012**
**Depreciation Expense - Sewer**

| Line Number | A Account Number | B Plant Account Description | C Adjusted Jurisdictional | D Depreciation Rate | E Depreciation Expense |
|---|---|---|---|---|---|
| 1 | | INTANGIBLE PLANT | | | |
| 2 | 301.000 | Organization | $135 | 0.00% | $0 |
| 3 | 302.000 | Franchises | $1,127 | 0.00% | $0 |
| 4 | 303.000 | Miscellaneous Intangible Plant | $0 | 0.00% | $0 |
| 5 | | TOTAL INTANGIBLE PLANT | $1,262 | | $0 |
| 6 | | SOURCE OF SUPPLY PLANT | | | |
| 7 | 310.000 | Land & Land Rights | $0 | 0.00% | $0 |
| 8 | 311.000 | Structures & Improvements | $2,532 | 3.00% | $76 |
| 9 | | TOTAL SOURCE OF SUPPLY PLANT | $2,532 | | $76 |
| 10 | | COLLECTION PLANT | | | |
| 11 | 352.100 | Collection Sewers - Force | $12,827 | 2.00% | $257 |
| 12 | 352.200 | Collection Sewers - Gravity | $105,094 | 2.00% | $2,102 |
| 13 | 353.000 | Other Collection Plant Facilities | $0 | 0.00% | $0 |
| 14 | 354.000 | Services to Customers | $18,120 | 2.00% | $362 |
| 15 | 355.000 | Flow Measuring Devices | $0 | 0.00% | $0 |
| 16 | | TOTAL COLLECTION PLANT | $136,041 | | $2,721 |
| 17 | | PUMPING PLANT | | | |
| 18 | 362.000 | Receiving Wells and Pump Pits | $1,804 | 5.00% | $90 |
| 19 | 363.000 | Pumping Equipment (Elec.,Diesel, other) | $24,068 | 10.00% | $2,407 |
| 20 | | TOTAL PUMPING PLANT | $25,872 | | $2,497 |
| 21 | | TREATMENT & DISPOSAL PLANT | | | |
| 22 | 372.000 | Oxidation Lagoon | $0 | 0.00% | $0 |
| 23 | 373.000 | Treatment and Disposal Equipment | $31,190 | 4.50% | $1,404 |
| 24 | 374.000 | Plant Sewers | $0 | 0.00% | $0 |
| 25 | 375.000 | Outfall Sewer Lines | $0 | 0.00% | $0 |
| 26 | 376.000 | Other Treatment & Disposal Plant Equip. | $0 | 0.00% | $0 |
| 27 | | TOTAL TREATEMENT & DISPOSAL PLANT | $31,190 | | $1,404 |
| 28 | | GENERAL PLANT | | | |
| 29 | 391.000 | Office Furniture & Equipment | $467 | 5.00% | $23 |
| 30 | 391.100 | Office Computer Equipment | $371 | 20.00% | $74 |
| 31 | 392.000 | Transportation Equipment | $228 | 13.00% | $30 |
| 32 | 394.000 | Tools Shop & Garage Equipment. | $15 | 5.00% | $1 |
| 33 | | TOTAL GENERAL PLANT | $1,081 | | $128 |
| 34 | | Total Depreciation | $197,978 | | $6,826 |

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=SR-2013-0435&attach_id=2013018070

Accounting Schedule:06
Sponsor: Paul R. Harrison
Page: 1 of 1



ATTACHMENT C

# APPENDIX I-C

# IS DEEMED CONFIDENTIAL

# IN ITS ENTIRETY

# PURSUANT TO COMMISSION RULE

# 20 CSR 4240-2.135(2)(A).1

# APPENDIX J-C

# IS DEEMED CONFIDENTIAL

# IN ITS ENTIRETY

# PURSUANT TO COMMISSION RULE

# 20 CSR 4240-2.135(2)(A)(3) and (6)

# APPENDIX K-C

# IS DEEMED CONFIDENTIAL

# IN ITS ENTIRETY

# PURSUANT TO COMMISSION RULE

# 20 CSR 4240-2.135(2)(A)(3) and (6)

## Integration Information

1. The anticipated location and hours of operation for the business office that will serve the customers in the Orrick service area is to be determined.

2. The anticipated methods for customers in the Orrick service area to contact the company during non-business hours will be the same customer service team that takes care of all MAWC customers. Customer service hours are 7:00 a.m.-7:00 p.m., Monday thru Friday and 24/7 coverage for emergencies.

3. What are the current payment options available for Orrick customers? Orrick customers can pay online with a credit card. Cash, check, and money order are accepted when paying in person.

   MAWC currently accepts and will offer to Orrick customers payment options of check, credit/debit cards and electronic funds transfer (EFT). Orrick customers will also have the option to make MAWC payments online via check or credit/debit cards. The credit card payment has a fee of $1.95.

4. Information for MAWC's intended credit and collection actions for delinquent accounts with associated time frames for each step of the process along with sample copies of notifications to customers are attached as Attachments 1 and 2.

5. The current billing process for Orrick customers is as follows:
   - Orrick customers meters are normally read the week of the 18th of each month.
   - Bills are then sent in mail around the first of the month, due by the 15th of the month.
   - A 10% penalty is assessed after the 15th of the month.
   - Service is turned off the 25$^{th}$ of each month.

   MAWC billing process begins once MAWC obtains a read. Within 3 days of that read, a bill is generated and has a due date of 21 days from invoice date. Payments can take up to 5 days to post depending on the method of payment.

6. A copy of the customer brochure summarizing the rights and responsibility of MAWC and its customers is attached as Attachment 3.

7. A copy of a sample bill which MAWC intends to utilize if it acquires the Orrick water and sewer systems is attached as Attachment 4.

8. No formal application process is required for new customers. Current Orrick customers will be integrated into the MOAW customer database using the provided customer information. New customers can call customer service or visit us online to activate new service.

| 1017 | Missouri | Missouri | Missouri | Missouri |
|---|---|---|---|---|
| Strategy | Residential | Non-Residential | Sewer Only | MultiDwelling |
| Threshold | $75 | $75 | $135 | $100 |
| Day Zero = Invoice Postmark | | | | |
| Day 1 | Invoice | Invoice | Invoice | Invoice |
| Day 2 | ↓ | ↓ | ↓ | ↓ |
| Day 3 | ↓ | ↓ | ↓ | ↓ |
| Day 4 | ↓ | ↓ | ↓ | ↓ |
| Day 5 | ↓ | ↓ | ↓ | ↓ |
| Day 6 | ↓ | ↓ | ↓ | ↓ |
| Day 7 | ↓ | ↓ | ↓ | ↓ |
| Day 8 | ↓ | ↓ | ↓ | ↓ |
| Day 9 | ↓ | ↓ | ↓ | ↓ |
| Day 10 | ↓ | ↓ | ↓ | ↓ |
| Day 11 | ↓ | ↓ | ↓ | ↓ |
| Day 12 | ↓ | ↓ | ↓ | ↓ |
| Day 13 | ↓ | ↓ | ↓ | ↓ |
| Day 14 | ↓ | ↓ | ↓ | ↓ |
| Day 15 | ↓ | ↓ | ↓ | ↓ |
| Day 16 | ↓ | ↓ | ↓ | ↓ |
| Day 17 | ↓ | ↓ | ↓ | ↓ |
| Day 18 | ↓ | ↓ | ↓ | ↓ |
| Day 19 | ↓ | ↓ | ↓ | ↓ |
| Day 20 | ↓ | ↓ | ↓ | ↓ |
| Day 21 | Due Date | Due Date | Due Date | Due Date |
| Day 22 | DD+1 | DD+1 | DD+1 | DD+1 |
| Day 23 | DD+2 | DD+2 | DD+2 | DD+2 |
| Day 24 | DD+3 | DD+3 | DD+3 | DD+3 |
| Day 25 | DD+4 | DD+4 | DD+4 | DD+4 |
| Day 26 | DD+5 | DD+5 | DD+5 | DD+5 |
| Day 27 | LDSN | LDSN | LSON | MDDN |
| Day 28 | DD+7 | DD+7 | DD+7 | DD+7 |
| Day 29 | DD+8 | DD+8 | DD+8 | DD+8 |
| Day 30 | CAF1 | CAF1 | DD+9 | CAF1 |
| Day 31 | CAFP | CAFP | CAF1 | CAFP |
| Day 32 | DD+11 | DD+11 | CAFP | DD+11 |
| Day 33 | LDMO | LDMO | BSEW | DD+12 |
| Day 34 | DD+13 | DD+13 | | DD+13 |
| Day 35 | DD+14 | DD+14 | | DD+14 |
| Day 36 | DD+15 | DD+15 | | DD+15 |
| Day 37 | DD+16 | DD+16 | | DD+16 |
| Day 38 | ODSN | ODSN | | OPNL |
| Day 39 | DD+18 | DD+18 | | DD+18 |
| Day 40 | DD+19 | DD+19 | | DD+19 |

| | | | | |
|---|---|---|---|---|
| **Day 41** | DD+20 | DD+20 | | DD+20 |
| **Day 42** | DD+21 | DD+21 | | DD+21 |
| **Day 43** | DD+22 | DD+22 | | DD+22 |
| **Day 44** | DD+23 | DD+23 | | DD+23 |
| **Day 45** | **MOUT** | **MOUT** | | DD+24 |
| **Day 46** | | | | DD+25 |
| **Day 47** | | | | DD+26 |
| **Day 48** | | | | DD+27 |
| **Day 49** | | | | DD+28 |
| **Day 50** | | | | **OMDN** |
| **Day 51** | | | | DD+30 |
| **Day 52** | | | | DD+31 |
| **Day 53** | | | | DD+32 |
| **Day 54** | | | | DD+33 |
| **Day 55** | | | | DD+34 |
| **Day 56** | | | | DD+35 |
| **Day 57** | | | | DD+36 |
| **Day 58** | | | | **MOUT** |

**Write Off Occurs 90 Days after final bills due.**

MISSOURI AMERICAN WATER

AMERICAN WATER, PO BOX 578, ALTON IL, 62002

For Service To:

| | |
|---|---|
| Account Number | |
| Pay Before | |
| Total Due | |

05/14/2021

**TIME SENSITIVE NOTICE:**

To ensure timely receipt of your payment, please use one of the payment options noted below. Do not mail your payment.

# IMPORTANT: DISCONTINUANCE NOTICE

**Please read and take the steps needed to avoid your service from being discontinued.**

**PAY THIS AMOUNT** **$180.91** **PRIOR TO** **05/25/2021**

Payment on your Water account is overdue. If payment is not received, your service may be shut off on or after 05/25/2021. You can prevent discontinuation of water service by paying the amount printed above. Please use one of our convenient payment options listed below to ensure your payment is applied to your account immediately.

It is our sincere goal to work with you to correct this situation before further action becomes necessary. Please respond immediately so that we can assist you as best as possible. If you do not respond to this notice and your service is disconnected, any installment plan may be considered in default and you may be required to pay the full amount due including a disconnection charge, a restoration charge, along with an excavation charge, if required.

Please note, someone must be available at the premises when service is restored.

**Disconnection Charge: $27.50**
**Regular Hour Restoration Charge: $27.50**
**Off Hour Restoration Charge: $159.00**
**Excavation Charge: Actual Cost**

Payment must be made before 3:00 pm to have service restored the same day and to avoid the off-hour restoration charge.

If discontinuance of service becomes necessary, operation of the customer owned stop cock will be necessary. If the stop cock is found inoperable or breaks in the process of either discontinuing or restoring service, you will be required to repair or replace the stop cock prior to service being restored.

## CONVENIENT PAYMENT OPTIONS

8 **Pay your bill online:** www.amwater.com/myaccount

) **Pay by Phone: 855-748-6066** 24 hours a day, seven days a week TTY/TDD FOR THE HEARING IMPAIRED: 711 (and then reference Customer Service number listed above)

€ **Pay in person:** for a list of approved payment locations, visit www.amwater.com/myaccount



Customer Service: M-F 7am to 7pm Emergency: 24/7: 1-855-669-8753 www.missouriamwater.com

ZZ_LDSNCOL_FICA

## MISSOURI AMERICAN WATER CUSTOMER SERVICE

**1-866-430-0820**

**HOURS:** M-F, 7am-7pm ▪ Emergencies: 24/7

**TTY/TDD FOR THE HEARING IMPAIRED:** 711 (and then reference Customer Service number listed above)

**Esto es un aviso importante sobre su servicio de agua. Para la ayuda de la traducción, por favor llamas a Missouri American Water al numero 1-866-430-0820.**

## ADDRESS, EMAIL OR PHONE NUMBER CHANGE REQUEST

Please let us know if we need to update your contact information in our records. NOTE: If you are moving or need to make a name change, please contact our customer service center at the phone number listed on the front of this notice. Updates to your contact information can also be made through our online self-service tool, **MyWater**. Access MyWater by visiting myaccount.amwater.com.

## EASY PAYMENT OPTIONS

- **Online:** Visit www.amwater.com/billpay. Please note that our payment partner charges $1.95 per transaction for e-check, credit card and debit card payments. Avoid the transaction fee by paying by e-check through MyWater at myaccount.amwater.com.
- **By phone:** 24/7 at 1-855-748-6066. Please note, there is a $1.95 transaction fee.
- **In person:** To find an authorized payment location near you, visit us online at missouriamwater.com. See Customer Service & Billing or call.

**Want to avoid late payments in the future? Consider enrolling in Auto Pay.** Enroll in Auto Pay, and your bill will be paid on time, every time. Each month, payments are automatically deducted from your checking or savings account on the due date. No stamps required.

## CUSTOMER ASSISTANCE PROGRAMS

If you're experiencing financial hardship, please reach out to us. We may be able to assist. Here are some of the programs we offer to help keep your life flowing:

### FINANCIAL ASSISTANCE

Through our H2O Help to Others Program, we offer financial assistance to customers who qualify, as well as a Low-Income Assistance Program for eligible customers in certain areas.

Learn more online at missouriamwater.com. Under Customer Service & Billing, select Payment Assistance Program.

### INSTALLMENT PLANS

You may be eligible for an installment plan to extend the time you have to pay a past due balance. Installment plans vary based on your past due amount and the information you provide to us about your ability to pay. We collect this information, including household income and number of people in your household, to determine what options we can provide to you.

### BUDGET BILLING

Budget billing is a free service that is available to eligible residential customers. The program makes managing your cash flow easier by providing predictable monthly payments and avoiding unplanned seasonal spikes that may be difficult to pay.

### WATER SAVING TIPS AND TOOLS

We offer tips and tools to help customers save water and money:

- **Leak Detection Kit** to help identify common and not-so-common household leaks.
- **Conservation Tips**

Visit missouriamwater.com. Under Water Information, select Detecting Leaks and Wise Water Use.

### MANAGE YOUR ACCOUNT ONLINE WITH MYWATER

MyWater is a fast and easy way to access and manage your account online.
Here are a few things you can do through MyWater:

- View and pay your bill
- Sign up for our Auto Pay and Paperless Billing programs.
- Check your account balance.
- Update your contact information.
- Sign up to receive emergency and non-urgent alerts by email, phone and text.
- View your water use history. (See in which months you use the most water to help determine ways you can save water and money.)

Access MyWater online at **myaccount.amwater.com.**

P.O. Box 578 Alton, IL 62002

05/14/2021

**For Service To:**
Account Number:
Service Address:

# FINAL DISCONTINUANCE NOTICE
# PAY THIS AMOUNT: $952.55 PRIOR TO: 05/19/2021

Payment on your Water account is overdue. If payment is not received, your service may be shut off on or after 05/19/2021. You can prevent discontinuation of water service by paying $952.55.

It is our sincere goal to work with you to correct this situation before further action becomes necessary. Please respond immediately so that we can assist you as best as possible. If you do not respond to this notice and your service is disconnected, any installment plan may be considered in default and you may be required to pay the full amount due including a disconnection charge, restoration charge, along with an excavation charge, if required. Please call customer service at the number listed below to ensure payment is applied to your account immediately.

Please note, someone must be available at the premises when service is restored.

**Disconnection Charge: $27.50**
**Regular Hour Restoration Charge: $27.50**
**Off Hour Restoration Charge: $159.00**
**Excavation Charge: Actual Cost**

Payment must be made before 3:00 pm to have service restored the same day and to avoid the off-hour restoration charge.

For St. Louis County customers only: If discontinuance of service becomes necessary, operation of the customer owned stop cock will be necessary. If the stop cock is found inoperable or breaks in the process of either discontinuing or restoring service, you will be required to repair or replace the stop cock prior to service being restored.

**CONVENIENT PAYMENT OPTIONS**

8 **Pay your bill online:** www.amwater.com/myaccount

) **Pay by Phone: 855-748-6066** 24 hours a day, seven days a week TTY/TDD FOR THE HEARING IMPAIRED: 711 (and then reference Customer Service number listed above)

€ **Pay in person:** for a list of approved payment locations, visit www.amwater.com/myaccount



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MISSOURI AMERICAN WATER

AMERICAN WATER, PO BOX 578, ALTON IL, 62002

For Service To:

| | |
|---|---|
| Account Number | |
| Pay Before | |
| Total Due | |

05/14/2021

**TIME SENSITIVE NOTICE:**

To ensure timely receipt of your payment, please use one of the payment options noted below. Do not mail your payment.

# IMPORTANT: OVERDUE NOTICE

**Please read and take the steps needed to avoid your service from being terminated.**

**PAY THIS AMOUNT** **$230.52** **PRIOR TO** **05/20/2021**

Providing reliable, quality wastewater service to our customers is a top priority. That's why we are contacting you today about a very important matter regarding your account. Your wastewater bill for the amount shown above is now overdue. To assure continued service, payment is due upon receipt of this notice. If you have already submitted your payment, thank you and please disregard this notice.
As a reminder, we provide our customers with several convenient ways to pay their bills.

1. Register for a self-service account and submit payment at www.amwater.com/MyAccount.
2. Sign up for our automatic payment program through our web site.
3. Mail your payment using the return envelope enclosed with your bill.
4. Pay by phone by calling 855-748-6066. (A small fee is charged for this service.)
5. Pay at a local authorized payment location. You can search for sites by zip code on our website.
6. If you do not respond to this notice and your service is disconnected, any installment plan may be considered in default and you may be required to pay the full amount due and a service charge of $0.00 before service is reconnected.

If you are unable to make payment in full, you may contact the company within the next 10 days to see if you are eligible to make payment arrangements.

Again, thank you for the opportunity to provide quality, reliable wastewater service in your community. If you have additional questions, please contact our customer service center at 1-855-669-8753.

**CONVENIENT PAYMENT OPTIONS**

8 **Pay your bill online:** www.amwater.com/myaccount

) **Pay by Phone: 855-748-6066** 24 hours a day, seven days a week TTY/TDD FOR THE HEARING IMPAIRED: 711 (and then reference Customer Service number listed above)

€ **Pay in person:** for a list of approved payment locations, visit www.amwater.com/myaccount



Customer Service: M-F 7am to 7pm Emergency: 24/7: 1-855-669-8753 www.missouriamwater.com

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# ADDRESS, EMAIL OR PHONE NUMBER CHANGE REQUEST

Please let us know if we need to update your contact information in our records. NOTE: If you are moving or need to make a name change, please contact our customer service center at the phone number listed on the front of this notice. Updates to your contact information can also be made through our online self-service tool, **MyAccount**. Access MyAccount from any electronic device by visiting www.amwater.com/MyAccount.

# WELCOME TO MISSOURI AMERICAN WATER

MISSOURI
AMERICAN WATER

WE KEEP LIFE FLOWING™

# WELCOME TO MISSOURI AMERICAN WATER!

We look forward to serving you. Inside this booklet, you will find information on the following:

**WATER & WASTEWATER SERVICE**

**INFRASTRUCTURE INVESTMENT**

**EMERGENCY NOTIFICATIONS**

**SERVICE ARRANGEMENTS**

**PAYMENT OPTIONS**

**LOW-INCOME ASSISTANCE PROGRAM**

For additional information, visit our website at **www.missouriamwater.com**.

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## A Message from Missouri American Water President DEBBIE DEWEY

Welcome to Missouri American Water. We are proud to be your water and/or wastewater service provider. Every day, our teams deliver more than 230 million gallons of high-quality water to approximately 1.5 million Missourians across the state, while at the same time treating the wastewater from thousands of homes and businesses and returning it safely to the environment. We're dedicated to providing the best water and wastewater service to the communities we serve.

This guide will answer questions you may have about our company and the services we offer. We hope you will review its contents and keep it for future reference. If you have questions about Missouri American Water, please call our Customer Service Center at (866) 430-0820.

Sincerely,

Debbie Dewey
President, Missouri American Water

# PROVIDING YOU HIGH-QUALITY WATER

We work closely with the United States Environmental Protection Agency, the Missouri Department of Natural Resources and other state authorities to provide water that meets and exceeds federal and state safety standards. Our parent company, American Water, has received more than 150 awards for superior water quality, and our water is 21 times better than the industry average. Our four surface water treatment plants in St. Louis County, as well as our treatment plants in Joplin and Jefferson City, have all been recently honored with 15-year Directors Awards from the Partnership for Safe Water, a recognition earned by fewer than 1 percent of all surface water treatment plants.

# RELIABLE WASTEWATER TREATMENT

We provide communities with scientifically proven and environmentally sound solutions for collection, treatment and release of wastewater.

Below are a few examples of technology we implement:

- Membrane Bioreactors: A powerful and efficient solution for the treatment of wastewater.
- Biological Nutrient Removal: The removal of nutrients through an activated sludge system.
- UV Disinfection: Replacing chlorine with more environmentally friendly technologies for a safer, more efficient way to disinfect wastewater.

# INVESTMENT YOU CAN COUNT ON

We continuously monitor, maintain and upgrade our facilities to ensure they operate efficiently and meet all regulatory standards. This requires investing in our infrastructure, including treatment plants, tanks, pump stations, fire hydrants and metering equipment.

Statewide, we invest approximately $80–130 million per year in infrastructure improvements. Our ongoing commitment to investing in and updating water and wastewater plants, pumps and pipelines helps ensure quality, reliable water service.


# EMERGENCY INFORMATION YOU NEED

Missouri American Water uses a high-speed mass notification system to keep customers informed about water-related emergencies. This technology is used when direct notification by doorhangers is not possible. Make sure we can reach you by updating your contact information today at **www.missouriamwater.com** through **My Account** or by calling us at **(866) 430-0820.**

# AROUND-THE-CLOCK CUSTOMER SERVICE

We've offered 24-hour customer service for years, but are making it even more convenient with our self-service website **My Account.** Here's what you can do from the comfort of your home:

- Turn water service on and off
- Track water use
- Sign up for emergency alerts
- Manage your account
- View and pay your bill
- Set up paperless billing

Sign up today by visiting
**www.missouriamwater.com**

# PAYMENT OPTIONS

AUTOMATIC PAYMENTS: Payments will be made from your bank account automatically.

PAY ONLINE: Visit amwater.com/billpay. A $1.95 transaction fee applies for credit/debit card payments.

PAY BY PHONE: Call (855) 748-6066 and use your Visa or MasterCard. A $1.95 transaction fee applies.

PAY BY MAIL: Send your payment and payment stub in the envelope provided. No cash, staples or paper clips.

PAY IN PERSON: Visit our website to find a location near you. Locations DO NOT accept payments by mail.

# OFFERING H20 HELP TO OTHERS

H2O Help to Others provides financial help to customers who are having trouble paying their bill. The program also connects customers with additional sources of aid in the community. The program is supported by contributions from Missouri American Water and customer donations. Contribute by checking the box on the back of your water bill.

An individual or family qualifies if they:

- Use Missouri American Water as their water provider
- Are in danger of having their water service terminated
- Meet the “basic needs” criteria set by Community Action Agency caseworkers

Apply by calling **(866) 430-0820.**

A document that provides the rights and responsibilities of the utility and its customers is available to all customers. Visit missouriamwater.com, click "Customer Service & Billing," and then click "Rights & Responsibilities" in the left sidebar to learn more about the rights and responsibilities, including the following:

(A) Billing and estimated billing procedures;

(B) Methods for customer verification of billing accuracy;

(C) Conditions of termination, discontinuance, and reconnection of service;

(D) Explanation of meter reading procedures which would enable a customer to read his/her own meter;

(E) A procedure where a customer may avoid discontinuance of service during a period of absence;

(F) The telephone number and address of a customer services office of the Missouri Public Service Commission, the commission's toll-free telephone number, and the statement that the company is regulated by the Missouri Public Service Commission;

(G) The address and telephone number of the Office of Public Counsel (OPC) and statement of the function of that office.

# HOW TO CONTACT US

Our customer service representatives are dedicated to handling every customer inquiry with attention and care.

**(866) 430-0820**
Hours: 7 a.m.–7 p.m.
For emergencies, we're available 24/7.

**infomo@amwater.com**

**www.missouriamwater.com**

MISSOURI
AMERICAN WATER

**WE KEEP LIFE FLOWING™**

MISSOURI AMERICAN WATER

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**Service Address:**

CUSTOMER NAME
100 ANYWHERE STREET
CITY, MO 12345-1234

THANK YOU FOR BEING OUR CUSTOMER.

## Important Account Messages

- Want to get to know us better? Visit www.missouriamwater.com to learn more about the services we provide.
- Thank you for being a long time customer! We work hard every day to deliver water service that is safe, reliable, and affordable -- our customers deserve nothing less.

For more information, visit www.missouriamwater.com

# Monthly Statement

Account No.**1017-XXXXXXXXXXX**

| | |
|---|---|
| **Total Amount Due:** | **$71.88** |
| Payment Due By: | **December 10, 2020** |

Thank you for using AutoPay. Payment will be automatically deducted on the bill due date.

| | |
|---|---|
| **Billing Date:** | November 18, 2020 |
| **Service Period:** | Oct 17 to Nov 17 (32 Days) |
| **Total Gallons:** | 4,100 |

## Account Summary – *See page 3 for Account Detail*

| | | |
|---|---|---|
| Prior Billing: | | $67.80 |
| Payments - Thank You! | - | $67.80 |
| **Balance Forward:** | = | **$0.00** |
| Service Related Charges: | + | $71.30 |
| Pass Through Charges: | + | $0.09 |
| Taxes: | + | $0.49 |
| Total Amount Due: | = | **$71.88** |

**View your account information or pay your bill anytime at:** www.amwater.com/MyAccount

**Pay by Phone*:** Pay anytime at 1-855-748-6066
**A convenience fee may apply*

**Customer Service**: 1-866-430-0820
M-F 7:00am to 7:00pm – Emergencies 24/7

6 Please return bottom portion with your payment. DO NOT send cash. Retain upper portion for your records. 6

Account No. **1017-XXXXXXXXXXX**

| | |
|---|---|
| **Total Amount Due:** | **$71.88** |
| Payment Due By: | **December 10, 2020** |

If paying after 12/10/20, pay this amount: $72.96

MISSOURI AMERICAN WATER

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*P.O. BOX 91623*
*RANTOUL, IL 61866-8623*

**Service to**: 100 ANYWHERE STREET
CITY, MO 12345-1234

**Amount Enclosed** $ **Paid Electronically on Due Date**

CUSTOMER NAME
100 ANYWHERE STREET CITY, MO
12345-1234

**MISSOURI AMERICAN WATER**
PO BOX 6029
CAROL STREAM, IL 60197-6029



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## Messages from Missouri American Water

- ***IMPORTANT WATER QUALITY MESSAGE: Your annual Water Quality Report can be viewed electronically at www.amwater.com/ccr/stlouisregion.pdf. If you prefer a paper copy to be sent to you, please contact our Customer Service Center at 866-430-0820.

- Effective 6/30/20, the Infrastructure System Replacement Surcharge (ISRS) per 1,000 gallons is $0.9629 for Rate A (residential & commercial), $0.0146 for Rate B (sale for resale), and $0.0140 for Rate J (large industrial). The ISRS funds completed water main replacements and related improvements for customers served by our St. Louis County operations. ISRS is implemented pursuant to Sections 393.1000, 393.1003, 393.1006, RSMo; 20 CSR 4240-2.060(1); and 20 CSR 4240-3.650. Additional information is available on our website at **www.missouriamwater.com.**


We use a high-speed notification system to quickly alert customers via phone, text and email when water emergencies occur. Visit **My Account** at **www.amwater.com/myaccount** to choose how you want to be notified and enter your contact information.

### CUSTOMER SERVICE
**1-866-430-0820**

**HOURS:** M-F, 7am-7pm ▪ Emergencies: 24/7
**TTY/TDD FOR THE HEARING IMPAIRED:**
711 (and then reference Customer Service number listed above)

### SERVICES

**Go Paperless:** Save time. Save money. Sign up for **Paperless Billing** and **Auto Pay** on My Account at amwater.com/myaccount. Not registered? Log in and be sure to have your account number handy.

**Water Quality:** We take water quality seriously. When it comes to complying with federal drinking water standards, we consistently score better than the industry average. For a copy of the annual water quality report for your area, visit missouriamwater.com. Under Water Quality, select Water Quality Reports.

**$H_2O$ Help To Others:** $H_2O$ Help to Others is an emergency assistance program created by Missouri American Water and Missouri's Community Action Agencies. The program helps provide supplemental funding to Missouri American Water customers who would otherwise have trouble paying their bills. $H_2O$ Help to Others is supported by contributions from Missouri American Water and voluntary contributions from customers.

### EXPLANATION OF OTHER TERMS

**Payment by Check:** Paying by check authorizes American Water to send the information from your check electronically to your bank for payment. The transaction will appear on your bank statement. The physical check will not be presented to your financial institution or returned to you.

**Estimated Bill:** This occurs when we are unable to read the water meter. Your usage from the same billing period the prior year is used to calculate the estimated bill. The next actual meter reading corrects any over or under estimates.

**Disputes:** If you have questions or complaints about your bill, please call us at 1-866-430-0820 before the due date. If your bill is unusually high, it may indicate that there is a leak in your plumbing. For tips on how to detect leaks and use water wisely, visit us online. You'll find helpful tools under the Water Information menu. Every drop counts!

**Rates:** A detailed listing of charges that make up your bill is available upon request by contacting Customer Service or visiting us online at missouriamwater.com. Under Customer Service & Billing, select Your Water and Sewer Rates.

**Correspondence:** Please send written correspondence to PO Box 578, Alton, IL 62002-0578. Be sure to include your name, account number, service address, mailing address and phone number including area code. Please do not send correspondence with your payment, as it may delay processing your payment and correspondence.

### H2O HELP TO OTHERS PROGRAM - lend a hand to customers in need

☐ I'm adding a one time contribution of $_____ with my payment.

☐ I'd like to add a recurring contribution to each bill of $_____. I understand this amount will be added to each bill.

**Address Change(s)**

Name

Address

City

State Zip Code

( ) ☐ Mobile Number
Phone Number

E-mail Address

### Other ways to pay your bill

**Auto Pay**
Save time and money. Enroll in Auto Pay, and your bill will be paid on time, every time, directly from your bank account on the due date. No stamps required!

**Online**
With My Account, you can pay your bill anytime, anywhere. Registration is fast and easy. Visit www.amwater.com/MyAccount or pay without registration at www.amwater.com/billpay (fee may apply).

**In Person**
We have agreements with several authorized payment locations in our service areas. Visit our website to find one near you.

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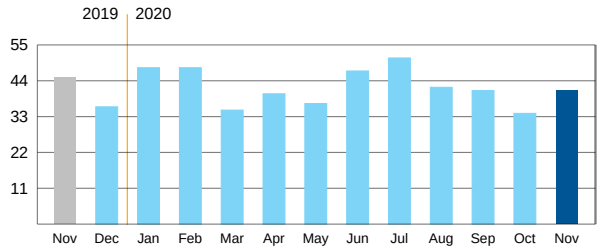
## Meter Reading and Usage Summary

| Meter No. | Measure | Size | From Date | To Date | Previous Read | Current Read | Meter Units | Billing Units | Total Gallons |
|---|---|---|---|---|---|---|---|---|---|
| XXXXXXXX | 100 gal | 5/8" | 10/17/2020 | 11/17/2020 | 515 (A) | 556 (A) | 41 | 41.00 | 4,100 |

A = Actual E = Estimate 1 Billing Unit = 100 gallons Total Gallons: 4,100

**Billed Usage History (graph shown in 100 gallons)**

n 4,100 gallons = usage for this period
n 4,500 gallons = usage for same period last year




**Next Scheduled Read Date:** on or about December 16, 2020
**Account Type:** Residential

Average daily use for this period is: (32 days)

**128 gallons**

Year to Date Billed Usage: 46,400 gallons

## Account Detail

Account No. 1017-XXXXXXXXXXX
Service To: 100 ANYWHERE STREET CITY, MO 12345-1234

| | | |
|---|---|---|
| **Prior Billing** | | **67.80** |
| **Payments** | | **-67.80** |
| Total payments as of Nov 10. Thank you! | | -67.80 |
| **Balance Forward** | | **0.00** |
| **Service Related Charges - 10/17/20 to 11/17/20** | | |
| **Water Service** | | **32.55** |
| Water Service Charge | | 9.00 |
| Water Usage Charge | (41 x $0.47814) | 19.60 |
| ISRS Surcharge | (41 x $0.09629) | 3.95 |
| **Wastewater Service** | | **38.75** |
| Wastewater Service Charge | (1 x $38.75) | 38.75 |
| **Total Service Related Charges** | | **71.30** |
| **Pass Through Charges** | | **0.09** |
| Water Primacy Fee | (1 x $0.09) | 0.09 |
| **Taxes** | | **0.49** |
| County Sales Tax | | 0.49 |
| **Total Current Period Charges** | | **71.88** |

**Total Amount Due** **$71.88**

## Understanding Your Bill

**The information below defines some of the new terms you may find on your bill:**

- **Service Related Charges:** This section includes charges for services related to water, wastewater and fire protection. If applicable, credits and debits for correction to previously billed charges are itemized in this section.
- **Fees and Adjustments:** This section provides details related to additional charges or adjustments for the service period referenced. Fees, when applicable, would include items such as service activation and late payment charges.
- **Pass Through Charges:** Charges in this section, when applicable, are separated from other service related charges to provide visibility into what portion of your bill is being remitted to other entities. Payment received for these charges does not remain with American Water. While we may bill and collect for them, the payments received are passed along to other companies and agencies.
- **Billing Units:** One billing unit equals 100 gallons of water used. If the meter serving your property measures your water use in cubic feet or a different unit of measure, we convert the usage to gallons to make it easier to understand.
- **Average Daily Use:** The gallons shown in the water droplet above represent your average daily water use for the current billing period. Tracking the amount of water you use can help you manage your overall water use from month to month.
- **Still have questions?** We are here to help. Our customer service representatives are available M–F, 7 a.m. to 7 p.m. More information on understanding your bill and charges can also be found on our website. See the link below.

For more information about your charges and rates, please visit:
https://amwater.com/moaw/rates

<This page is intentionally left blank and reserved for future messages>