Permit No. CP0002095

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Kansas City Westside WWTF
1849 Woodswether Road
Kansas City, MO 64105

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

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

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

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

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

Febuary 03, 2020
Effective Date

April 13, 2022
Modification Date

October 15, 2022
Expiration Date

Chris Wieberg
Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The purpose of construction is to install a clarifier and additional disinfection to provide treatment of peak wet weather flows up to 70 MGD, with the design average flow remaining at 22.5 MGD. The facility serves a portion of Kansas City's combined sewer system and as such experiences high wet weather peaking flows. The addition of Chemically Enhanced Primary Treatment (CEPT) will include addition of polyaluminum chloride (PACl) and polymer upstream of the primary clarifiers to increase the TSS and particulate BOD removal in the primary clarifiers. A third secondary clarifier will be constructed, with the potential of a fourth secondary clarifier to be installed. The clarifier(s) will have a 135 ft diameter, sidewater depth of 18 ft and the surface area will be 14,314 sf. A third chlorine basin will be constructed with a capacity of 312,495 gallons to accommodate 30 MGD, providing 15 minutes of contact time at the overall peak flow of 70 MGD through the 3 disinfection basins. Construction will include a second housing facility to hold the additional chemicals for the expanded disinfection system and for the polymer addition.

This project will also include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make a complete and usable wastewater treatment facility.

II. COST ANALYSIS FOR COMPLIANCE

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

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

III. CONSTRUCTION PERMIT CONDITIONS

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

1. This construction permit does not authorize discharge.

2. All construction shall be consistent with plans and specifications signed and sealed by Carollo Engineers, Inc. and as described in this permit.

3. The Department must be contacted in writing prior to making any changes to the plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

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

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

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

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

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

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

    - Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation. 10 CSR 20-8.140 (2) (B)

- Facilities shall be readily accessible by authorized personnel from a public right–of-way at all times. 10 CSR 20-8.140 (2) (D)

- The alarm shall be activated in cases of high water levels. Follow the provisions in subsection (7)(C) of this rule for alarm systems. 10 CSR 20-8.140 (4) (D)

- All wastewater treatment facilities shall be provided with an alternate source of electric power or pumping capability to allow continuity of operation during power failures. 10 CSR 20-8.140 (7) (A) 1.

- Disinfection and dechlorination, when used, shall be provided during all power outages. 10 CSR 20-8.140 (7) (A) 2.

- Electrical systems and components in raw wastewater or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors that are normally present, shall comply with the NFPA 70 *National Electric Code (NEC)* (2017 Edition), as approved and published August 24, 2016, requirements for Class I, Division 1, Group D locations. 10 CSR 20-8.140 (7) (B)

- An audiovisual alarm or a more advanced alert system, with a self-contained power supply, capable of monitoring the condition of equipment whose failure could result in a violation of the operating permit, shall be provided for all wastewater treatment facilities. 10 CSR 20-8.140 (7) (C)

- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140 (7) (D) 1.

- Where a potable water supply is to be used for any purpose in a wastewater treatment facility other than direct connections, a break tank, pressure pump, and pressure tank or a reduced pressure backflow preventer consistent with the department's Public Drinking Water Branch shall be provided. 10 CSR 20-8.140 (7) (D) 3. A.

- For indirect connections, a sign shall be permanently posted at every hose bib, faucet, hydrant, or sill cock located on the water system beyond the break tank or backflow preventer to indicate that the water is not safe for drinking. 10 CSR 20-8.140 (7) (D) 3. B.

- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility:
    - Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140 (8) (A)
    - Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140 (8) (B)
    - First aid equipment; 10 CSR 20-8.140 (8) (C)
    - Posted "No Smoking" signs in hazardous areas; 10 CSR 20-8.140 (8) (D)

- Appropriate personal protective equipment (PPE); 10 CSR 20-8.140 (8) (E)
- Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140 (8) (F)
- 10 CSR 20-8.140 (8) (G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
- 10 CSR 20-8.140 (8) (H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
- Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140 (8) (I)

- Ventilation shall include the following:
  - Isolate all pumping stations and wastewater treatment components installed in a building where other equipment or offices are located from the rest of the building by an air-tight partition, provide separate outside entrances, and provide separate and independent fresh air supply; 10 CSR 20-8.140 (8) (J) 1.
  - Force fresh air into enclosed screening device areas or open pits more than four feet (4') deep. 10 CSR 20-8.140 (8) (J) 2.
  - Dampers are not to be used on exhaust or fresh air ducts. Avoid the use of fine screens or other obstructions on exhaust or fresh air ducts to prevent clogging; 10 CSR 20-8.140 (8) (J) 3.
  - Where continuous ventilation is needed (e.g., housed facilities), provide at least twelve (12) complete air changes per hour. Where continuous ventilation would cause excessive heat loss, provide intermittent ventilation of at least thirty (30) complete air changes per hour when facility personnel enter the area. Base air change demands on one hundred percent (100%) fresh air; 10 CSR 20-8.140 (8) (J) 4.
  - Electrical controls. Mark and conveniently locate switches for operation of ventilation equipment outside of the wet well or building. Interconnect all intermittently operated ventilation equipment with the respective wet well, dry well, or building lighting system. The manual lighting/ventilation switch is expected to override the automatic controls. For a two (2) speed ventilation system with automatic switch over where gas detection equipment is installed, increase the ventilation rate automatically in response to the detection of hazardous concentrations of gases or vapors; 10 CSR 20-8.140 (8) (J) 5.
  - Fabricate the fan wheel from non-sparking material. Provide automatic heating and dehumidification equipment in all dry wells and buildings. 10 CSR 20-8.140 (8) (J) 6.
  - Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive

atmospheres of flammable gas or vapor with air may accumulate. 10 CSR 20-8.140 (8) (K)
    - Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140 (8) (L)
    - Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140 (8) (M)

- The materials utilized for storage, piping, valves, pumping, metering, and splash guards, etc., for chemical handling, shall be specially selected considering the physical and chemical characteristics of each hazardous or corrosive chemical. 10 CSR 20-8.140 (9) (A) 1.

- All pumps or feeders for hazardous or corrosive chemicals shall have guards that will effectively prevent spray of chemicals into space occupied by facility personnel. 10 CSR 20-8.140 (9) (A) 3.

- All piping containing or transporting corrosive or hazardous chemicals shall be identified with labels every ten feet (10') and with at least two (2) labels in each room, closet, or pipe chase. 10 CSR 20-8.140 (9) (A) 4. A.

    - Effective flow splitting devices and control appurtenances (e.g. gates and splitter boxes) shall be provided to permit proper proportioning of flow and solids loading to each settling unit, throughout the expected range of flows. 10 CSR 20-8.160 (2) (B)
    - Overflow weirs shall be readily adjustable over the life of the structure to correct for differential settlement of the tank. 10 CSR 20-8.160 (3) (C) 1.
    - Walls of settling tanks shall extend at least six inches (6") above the surrounding ground surface and shall provide not less than twelve inches (12") of freeboard. 10 CSR 20-8.160 (3) (E)
    - Safety features shall appropriately include machinery covers, life lines, handrails on all stairways and walkways, and slip resistant surfaces. For additional safety follow the provisions listed in 10 CSR 20-8.140(8). 10 CSR 20-8.160 (5) (A)
    - The design shall provide for convenient and safe access to routine maintenance items such as gear boxes, scum removal mechanism, baffles, weirs, inlet stilling baffle areas, and effluent channels. 10 CSR 20-8.160 (5) (B)
    - For electrical equipment, fixtures, and controls in enclosed settling basins and scum tanks, where hazardous concentrations of flammable gases or vapors may accumulate, follow the provisions in 10 CSR 20-8.140(7)(B). The fixtures and controls shall be conveniently located and safely accessible for operation and maintenance. 10 CSR 20-8.160 (5) (C)

- Emergency Power. Disinfection and dechlorination processes, when used, shall be provided during all power outages. 10 CSR 20-8.190 (2) (A)

- The materials utilized for storage, piping, valves, pumping, metering, and splash guards, etc., for chemical handling, shall be specially selected considering the physical and chemical characteristics of each hazardous or corrosive chemical. 10 CSR 20-8.140 (9) (A) 1.

- Secondary containment storage areas contain the stored volume of chemical until it can be safely transferred to alternate storage or released to the wastewater treatment plant at controlled rates that will not damage the facilities, inhibit the treatment processes, or contribute to stream pollution. Secondary containment shall be designed as follows:
    - A minimum volume of one hundred twenty-five percent (125%) of the volume of the largest storage container located within the containment area plus the space occupied by any other tanks located within the containment area when not protected from precipitation; 10 CSR 20-8.140 (9) (A) 2. A.
    - A minimum volume of one hundred ten percent (110%) of the volume of the largest storage container located within the containment area plus the space occupied by any other tanks located within the containment area when protected from precipitation; 10 CSR 20-8.140 (9) (A) 2. B.
    - Walls and floors of the secondary containment structure constructed of suitable material that is compatible with the specifications of the product being stored. 10 CSR 20-8.140 (9) (A) 2. C.

- All pumps or feeders for hazardous or corrosive chemicals shall have guards that will effectively prevent spray of chemicals into space occupied by facility personnel. 10 CSR 20-8.140 (9) (A) 3.

- Piping, labeling, and coupling guard locations. 10 CSR 20-8.140 (9) (A) 4.

- All piping containing or transporting corrosive or hazardous chemicals shall be identified with labels every ten feet (10') and with at least two (2) labels in each room, closet, or pipe chase. 10 CSR 20-8.140 (9) (A) 4. A.

- All connections (flanged or other type), except those adjacent to storage or feeder areas, shall have guards that will direct any leakage away from space occupied by facility personnel. 10 CSR 20-8.140 (9) (A) 4. B.

- Facilities shall be provided for automatic shutdown of pumps and sounding of alarms when failure occurs in a pressurized chemical discharge line. 10 CSR 20-8.140 (9) (A) 5.

- Dust collection equipment shall be provided to protect facility personnel from dusts injurious to the lungs or skin and to prevent polymer dust from settling on walkways that become slick when wet. 10 CSR 20-8.140 (9) (A) 6.

- Contact period for Chlorine Disinfection. A minimum contact period of fifteen (15) minutes at design peak hourly flow or maximum rate of pumpage shall be provided after thorough mixing. 10 CSR 20-8.190 (3) (A)

- Contact time. A minimum of thirty (30) seconds for mixing and contact time of dechlorination systems shall be provided at the design peak hourly flow or maximum rate of pumpage. 10 CSR 20-8.190 (4) (B) 2.

10. Upon completion of construction:

A. Kansas City will become the continuing authority for operation and maintenance of these facilities;

B. Submit an electronic copy of the as builts; and

C. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(N). When the facility applies for their next operating permit renewal, they will be expected to include an updated facility description on their application.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The purpose of construction is to install a clarifier and additional disinfection to provide treatment of peak wet weather flows up to 70 MGD. The facility serves a portion of Kansas City's combined sewer system and as such experiences high wet weather peaking flows. As part of the long-term control plan, Kansas City is installing additional treatment at the facility.

2. FACILITY DESCRIPTION

The Kansas City Westside WWTF is located at 1849 Woodswether Road, Kansas City, in Jackson County, Missouri. The facility has influent pump station, aerated grit basins, primary clarifiers, activated sludge aeration basins, secondary clarifiers, chlorine disinfection with sludge pumped to Blue River WWTF for final handling. The facility discharges to the Missouri River. The facility has a design average flow of 22.5 MGD and serves a hydraulic population equivalent of approximately 225,000 people.

3. COMPLIANCE PARAMETERS

The facility will have to meet the final effluent limits in their state operating permit, MO-0024929. No effluent limits are changing as part of this construction project; however the operating permit renewal is currently under review with the Department.

The limits applicable to the facilty include the following:

Parameter	Units	Monthly average limit
Flow	MGD	*
Biochemical Oxygen Demand$_5$	mg/L	30
Total Suspended Solids	mg/L	30
Ammonia as N	mg/L	*
Total Residual Chlorine	µg/L	130
E. Coli	#/100mL	206

*monitoring only

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Existing major components which will remain in use include the following:

- Influent- All influent to Westside is pumped from a series of combined and sanitary sewer systems through three force mains that combine at the head of the WWTP.
- Electromagnetic Meter – An influent electromagnetic 48-inch flow meter measures the influent wastewater.
- Grit Removal –Grit removal prevents downstream abrasion and wear on mechanical components and accumulation at the bottom of basins or channels.
    - Grit Basin – Two identical rectangular aerated grit basins, approximately 133 feet long by 28 feet wide with an operating level of 14 feet. Originally constructed in 1962. The aeration system in the grit chamber is currently inoperable and the basins are serving as a location for heavy particles and some primary solids to settle out.
- Primary Clarifier – A primary clarifier removes settleable organic and inorganic solids by sedimentation and floatables and scum by skimming. Originally constructed in 1962.
    - Westside has 2 primary clarifiers that were converted into 2003 to circular clarifiers with peripheral launders equipped with a single 90 degree, 2 ¼ inch V-notch weir spaced at 6 inches on center.
    - The primary clarifiers have an internal diameters of 125 feet, a side water depth of 8 feet, a surface area of 12,272 ft^2, volume of 0.877 MG, and a weir length of 393 ft.
    - From the 2006/2007 stress tests, 50 MGD is considered the peak flow treatment capacity of the primary clarifiers.
        - Using 50 MGD, the surface overflow rate is 2,037gpd/ft^2.
- Activated Sludge – The existing 3.5 MG of aeration basin volume is sufficient for treating approximately 39 MGD of average day flow, assuming a 2-day SRT and 4,000 mg/L MLSS. Originally constructed in 1977.
    - Aeration Basin 1 is square shaped and operates as complete-mix system. Surface area of 17,500 ft^2 with 13.5 feet of normal water depth and 4 aerators.
    - Aeration Basin 2 is rectangular shaped and can be operated as complete-mix or as a step-feed system. Surface area of 17,500 ft^2 with 13.5 feet of normal water depth and 6 aerators.

- Secondary Clarifier – The existing 2 secondary clarifiers have a 135 ft internal diameter with 13ft sidewater depth and a surface area of 14,314 ft^2. Originally constructed in 1977.
    - From the 2006/2007 stress test, 40 MGD is considered the peak flow treatment capacity of the secondary clarifiers without solids washing out.
    - Using the peak flow of 40 MGD, the existing surface overflow rate of 2 clarifiers is 1,400 gpd/sq ft.
- Disinfection – Disinfection is the process of removal, deactivation, or killing or pathogenic microorganisms. Construction of the existing chlorine disinfection system was completed under CP0001047 in 2012.
    - The basin consists of 2 trains sized for 40 MGD with a mixer.
    - The chlorine building consists of 2-12,600 gallon sodium hypochlorite tanks and 2-3,000 gallon sodium bisulfite tanks with with metering pumps on both the chlorine and dechlorination tanks.
- Housed Facility- The existing disinfection building contains an electrical and mechanical room plus two additional rooms that house the chemical storage and feed systems.
- Effluent flows to the Missouri River through a 60 inch pipeline by gravity unless the water level is high on the Missouri River.

Construction will cover the following items:
The facility used BioWin modeling and State Point Analysis to model system performance with the proposed changes.

- The non-operational aeration system in the grit basins will be removed; however the basins will operate as flocculation basins for the chemical enhanced primary treatment.
    - Fiberglass reinforced plasic (FRP) baffle walls will be installed in the grit removal basins
- Chemically Enhanced Primary Treatment (CEPT)- The addition of CEPT will include addition of polyaluminum chloride (PACl) and polymer upstream of the primary clarifiers to increase the TSS and particulate BOD in the primary clarifiers.
    - Feed points for both chemicals will be routed to three locations within each treatment train of the primary treatment process.
        - Inlet weir in the distribution box that serves both aerated grit basins. A partial-width baffle wall will be installed near the upstream end of each basin to promote coagulation and flocculation.
        - Upstream inlet pipe to either clarifier.
        - Inlet well of each clarifier.
    - PACl will be delivered in liquid form and stored in fiberglass reinforced plastic (FRP) bulk storage tanks at Disinfection Building No. 2. The PACl will be pumped, separately,directly from these bulk storage tanks to the respective dosage points at the primary clarifiers using peristaltic pumps.
        - PACI Bulk Storage tank has a capacity of 8700 gallons and the storage availability of 5 days

- 3 peristalic PACI Chemical feeds pumps with a capacity of 20-125 gph.
- 2 polymer totes with 8 days of storage and a capacity of 250 gallons.
- 3 peristalic pumps operating as polymer blending units with the capacity of up to 300 gpm of polymer solution.

- Primary Clarifiers - With the chemically enhanced primary treatment, the surface loading rate in the primary clarifiers is 916.7 gpd/ft^2 at design average flow of 22.5 MGD and 119 gpd/ft^2 at peak hourly flow, which meets the requirements of 10 CSR 20-8.160(3)(B)1, Table 160-2.
- Activated Sludge – Modifications to Aeration Basin 1 and 2 will include the construction of concrete open channel to route effluent to the new final clarifier flow splitter, supplemental compressed air to discourage settling, and new piping from the new RAS/WAS Pump Station to follow the alignment and discharge pattern of the existing pipe at the bottom of the aeration basin. The new concrete open channel will be 6 feet wide and approximately 11 feet deep and constructed of cast-in-place concrete.
- Flow Splitter - A new splitter structure will be constructed to split flow between existing Final Clarifiers No. 1 and 2 and the new Final Clarifier No. 3 (and No. 4 as bid alternate).
  - The splitter structure will be a cast-in-place concrete structure with dimensions of approximately 49 feet by 38 feet.
  - Flow from Aeration Basins No. 1 and 2 will be conveyed by two open channels to a 35 feet by 25 feet well.
  - The flow will be split to four FRP weir troughs that each empty into a separate cell, each approximately 5 feet wide by 17 feet long.
  - The ability to add polymer at the flow splitter is being added to further enhance solids settling characteristics in the secondary clarifier.

- Secondary Clarifier – A third secondary clarifier will be constructed, with the potential of a fourth secondary clarifier to be installed. State Point Analysis was conducted to maximize the performance of the new clarifier. State Point Analysis is a analytical process that graphs the interrelationship between sludge settleability, solids overflow rate, return activated sludge, and solids loading rate to evaluate clarifier performance. The facility will have the ability to add additional polymer before flow enters the system to enhance solids settling characteristics.
  - The clarifier(s) will have a 135 ft diameter.
  - The sidewater depth will be 18 ft, which meets the requirements of 10 CSR 20-8.160(3)(A), Table 160-1.
  - The surface area per clarifier will be 14,314 sf.
- With 3 secondary clarifiers installed, there will be
  - A total surface area of 42,942 sf at the 70 MGD peak flow.
  - At the expected MLSS of 1200 mg/L for wet weather flows, the solids loading rate is 16.3 lbs/day/sf which meets the requirements of 10 CSR 20-8.160(4)(B)3 of less than 50 lbs/day/sf at peak flow.
  - The surface overflow rate at 70 MGD is 1,630 gpd/ft^2.
  - The weir loading rate at 70 MGD is 55,016 gpd/sf.
- If the facility installs the 4th secondary clarifier,

- There will be a total surface area of 57,256 sf.
- At the expected MLSS of 1,200 mg/L for wet weather flows, the solids loading rate is 12.2 lbs/day/sf which meets the requirements of 10 CSR 20-8.160(4)(B)3 of less than 50 lbs/day/sf at peak flow.
- The surface overflow rate at 70 MGD is 1,222 gpd/ft^2.
- The weir loading rate at 70 MGD is 41,263 gpd/sf.

- RAS/WAS Pump Station
  - 3 duty with 1 standby 50 HP submersible centrifugal chopper RAS pump with a capacity of 4600 gpm and 23 ft of head.
  - 1 duty with 1 standby 25 HP submersible centrifugal chopper WAS pump with a capacity of 700 gpm and 60 ft of head.
  - 1 scum pump at each clarifer with 1 standby pump 15 HP submersible centrifugal chopper with 65 gpm capacity and 150 ft of head.
  - RAS from the RAS/WAS Pump Station will also be fed into each Aeration Basin through a separate pipe with outlet ports at the bottom of each basin.
- Disinfection – Disinfection is the process of removal, deactivation, or killing or pathogenic microorganisms.
  - Chlorine Basin – Installation of approximately 113.83 ft x 44.5 ft x 16.5 ft basin with 4 end-around baffles allowing for a 40:1 length to width ratio. The basin capacity is 312,495 gallons to accomadate 30 MGD, providing 15 mintues of contact time at the overall peak flow of 70 MGD through the 3 disinfection basins.
    - The sodium hypochlorate dose is expected to be 8.0 mg/L
    - The sodium bisulfite dose with 10% exess is expected to be 9.7 mg/L to achieve dechlorination.
  - Housed Facility - A second disinfection building will be constructed to hold additional chemicals for the expanded disinfection system.
    - Sodium Hypochlorite
      - Bulk Storage tank of 7,000 gallons capacity which will provide 3 days of storage at 70 MGD
      - 2 Peristaltic feed pumps with a capacity of 15-95 gph.
      - 1 Peristaltic transfer pump with the capacity of 2100 gph, which will be able to transfer a tank in 6 hours.
    - Sodium Bisulfite
      - Bulk Storage tank of 2,000 gallons capacity which will provide 3 days of storage at 70 MGD
      - 2 Peristaltic feed pumps with a capacity of 1.3-24.1 gph.
      - 1 Peristaltic transfer pump with the capacity of 500 gph, which will be able to transfer a tank in 6 hours.
    - Chemical transfer pumps for the new disinfection system will allow disinfection chemicals to be transferred between the new and existing storage tanks.
- Effluent Pump Station/High Water Level Pump Station – The high water level pump station is only to be utilized when the receiving stream is at a level that the discharge cannot flow out with gravity. The existing 3 vertical effluent 25 MGD, 120 HP pumps will be replaced with 2 duty, 1 stand-by, and 1 spare 145 HP vertical submersible propeller pumps each with a design capacity of

33 MGD for a total firm capacity of 66 MGD and a total dynamic head of 20 ft.

5. OPERATING PERMIT

These construction activities do not require a modification to the operating permit. It is expected that the facility owner will include a new facility description and process flow diagram in their next operating permit renewal application to reflect the installation of the new final clarifier(s) and the additional chlorine disinfection basin for wet weather flows.

6. CONSTRUCTION PERMIT MODIFICATION

This construction permit is being modified upon the request of the facility owner to extend the construction permit schedule. The construction permit will now expire on October 15, 2022.

V. NOTICE OF RIGHT TO APPEAL

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

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

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