

**STATE OF MISSOURI**  
**DEPARTMENT OF NATURAL RESOURCES**  
**MISSOURI CLEAN WATER COMMISSION**



**CONSTRUCTION PERMIT**

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

The City of Salem  
410 N. Iron Street  
Salem, MO 65401

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.

October 17, 2018  
Effective Date

August 31, 2020  
Modification Date

  
Edward B. Galbraith, Director, Division of Environmental Quality

December 16, 2020  
Expiration Date

  
Chris Wieberg, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

The City proposed to construct a new headworks facility, repair/improve existing oxidation ditch and install a new secondary clarifier flow splitter.

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 in accordance with the plans and specifications submitted by Archer-Elgin on July 19, 2018.
3. The Department must be contacted in writing prior to making any changes to the approved 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(8).

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 Southeast Regional Office per 10 CSR 20-7.015(9)(E)2.
5. 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](http://dnr.mo.gov/env/wpp/epermit/help.htm). See [dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm](http://dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm) for more information.
6. 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/](http://dnr.mo.gov/env/wpp/401/) for more information.
7. Upon completion of construction:
  - A. The City of Salem will become the continuing authority for operation, maintenance, and modernization of these facilities;
  - B. Submit an electronic copy of the as built if the project was not constructed in accordance with previously submitted plans and specifications; 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**

A new influent headworks facility will allow the removal of coarse solids from the raw influent wastewater. Improvements of the existing oxidation ditch will limit the potential excessive operating water surface elevations within the oxidation ditch during peak flow events.

## **2. FACILITY DESCRIPTION**

Influent is transported to the existing facility by an 18 inch Ductile Iron Pipe (DIP) and a 24 inch DIP. Flows are then joined at the old influent pump station. Effluent leaves the old pump station by a single 36 inch DIP and is pumped to the headworks facility by a more recently constructed influent pump station. The headworks facility has a peak flow splitter that directs excess flows to a peak flow storage basin. The wastewater flows to an oxidation ditch for secondary treatment.

Flows exit the oxidation ditch and move to three secondary clarifiers as directed by the secondary flow splitter box. Effluent from the clarifiers is transported and combined at the non-potable pump station. During recreational season, the flow is lifted to UV disinfection when flow is diverted around the pump station and UV system during the non-recreational season. A flow meter structure follows the pump station and the effluent is then discharged at outfall #001.

Sludge is both wasted and returned to the head of the facility by a return activated sludge and waste activated sludge pump station. Waste sludge is pumped to 2 sludge storage basins and 3 reed beds.

The new construction includes building a new headworks facility, improving oxidation ditch and replacing the existing the secondary flow splitter box with a new one.

The Salem WWTF is located at Highway 19 N., City of Salem, Dent County, Missouri. The facility has a design average flow of 741,000 gpd and serves a population equivalent of approximately 7410 people.

## **3. COMPLIANCE PARAMETERS**

The proposed constructions and improvements are necessary for the facility to accommodate the operating permit effluent limitations.

#### **4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA**

- Influent Headworks Facility: It consists of a new peak flow splitter located on the upstream and new screening process. The splitter provides for flow control to the new screening processes and the peak flow storage basin. The screening of the headworks has two elevated channels (2 ft. wide x 6 ft. deep), one with mechanical screen and the other with manual bar screen. The mechanical screen is a continuous belt, perforated plate configuration with a maximum spacing of 0.25-inch. The screening device shall be capable of treating a design average flow of 741,000 gpd and a peak hourly flow of 0.857 MGD. A manually cleaned coarse bar screen shall be in the dual channel with a clear bar spacings of 1.5-inch and be positioned at an angle of 60 degrees from the horizontal to allow for manual raking of the screen. The addition of a manually cleaned bar screen provides redundancy and a means of unit isolation for the mechanically cleaned screen.
- Oxidation ditch bridge structural repairs: The existing oxidation ditch aerating equipment bridges are currently in a state of advanced deterioration and must be demolished and replaced. Also, there is significant grit accumulation in the oxidation ditch which requires removal and disposal. To facilitate the work, the oxidation ditch must be removed from service during a low-flow period and temporarily treat influent wastewater in the facility's existing peak flow storage basin. Temporary surface aeration equipment (2 aerators) will be installed in the storage basin to provide both mixing and aeration of the mixed liquor. The surface aerators shall be Aeration Industries International Triton Process Aerator/Mixer units, or equivalent. Aeration by means of duplex 7.5 hp blowers capable of supplying 381 scfm each to 2 fine bubble diffusers. One of the aerators will be relocated to oxidation ditch for permanent installation to provide extra aeration equipment redundancy.
- The secondary clarifier flow splitter: It will be replaced with a new flow splitting structure containing 6-ft wide weir gates in lieu of the 2-ft wide weir gates present in the existing flow splitter.

#### **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 in their next operating permit renewal application to reflect the installation of a new headwork and flow splitter.

#### **6. CONSTRUCTION PERMIT MODIFICATION**

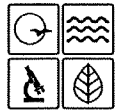
This construction permit is being modified upon the request to extend the construction permit schedule. The construction permit will now expire on December 16, 2020.

## **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>

Lei Hou, PE  
Engineering Section  
[lei.hou@dnr.mo.gov](mailto:lei.hou@dnr.mo.gov)



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM

**APPLICATION FOR CONSTRUCTION PERMIT –  
WASTEWATER FACILITY**

RECEIVED

JUL 19 2018

Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED	CHECK NO.
DATE RECEIVED	

**APPLICATION OVERVIEW**

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

**PART A – BASIC INFORMATION**

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

- 1.1 Is this a Federal/State funded project? ☐ YES ☒ N/A Funding Agency: \_\_\_\_\_ Project #: \_\_\_\_\_
- 1.2 Is this an application for an agrichemical? ☐ YES (See instructions.) ☒ N/A
- 1.3 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?  
☒ YES Date of Approval: \_\_\_\_\_
- 1.4 Has the department approved the proposed project's facility plan\*?  
☒ YES Date of Approval: May 10 2018 ☐ NO ☐ N/A (If Not Applicable, complete No. 1.5.)
- 1.5 [Complete only if answered Not Applicable on No. 1.4] Is a copy of the engineering report\* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?  
☐ YES ☐ NO
- 1.6 Is a copy of the appropriate plans\* and specifications\* included with this application?  
☒ YES Denote which form is submitted: ☐ Hard copy ☒ Electronic copy (See instructions.) ☐ NO
- 1.7 Is a summary of design\* included with this application? ☒ YES ☐ NO
- 1.8 Is a general operating permit applicable?  
☐ YES Submit the appropriate operating permit application to the Regional Office at least 60 days prior to operation.  
☒ NO Enclose the appropriate operating permit application and fee submittal. Denote which form: ☐ B ☒ B2
- 1.9 Is the facility currently under enforcement with the department or the Environmental Protection Agency? ☐ YES ☒ NO
- 1.10 Is the appropriate fee included with this application? ☒ YES ☐ NO (See instructions for appropriate fee.)

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

**2.0 PROJECT INFORMATION**

**2.1 NAME OF PROJECT**

Salem, MO WWTF Improvements - Phase 1B

**2.2 PROJECT DESCRIPTION**

The Salem WWTF Phase 1A improvements project involves the construction of a headworks facility, oxidation ditch improvements and new secondary clarifier flow splitter.

**2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION**

Excess sludge produced from the biological secondary treatment processes is pumped to aerobic digester for stabilization. stabilized sludge is dosed to sludge reed beds for dewatering. Every seven to eleven years, the dewatered sludge is removed from the reed beds and land applied as a solid soil amendment.

**2.4 DESIGN INFORMATION**

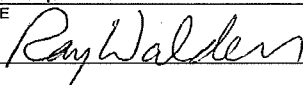
- A. Current population: 4924; Design population: 7410
- B. Actual Flow: 826000 gpd; Design Average Flow: 741000 gpd;  
Actual Peak Daily Flow: 6500000 gpd; Design Maximum Daily Flow: 1482000 gpd;  
Design Wet Weather Event: 6500000

**2.5 ADDITIONAL INFORMATION**

- A. Is a topographic map attached? ☒ YES ☐ NO
- B. Is a process flow diagram attached? ☒ YES ☐ NO

**2.6 ESTIMATED PROJECT CONSTRUCTION COST**

\$ 1,100,000.00

<b>3.0 WASTEWATER TREATMENT FACILITY</b>					
NAME Salem, MO WWTF		TELEPHONE NUMBER WITH AREA CODE (573) 729-4811		EMAIL ADDRESS water@salememo.com	
ADDRESS (PHYSICAL) Highway 19 N		CITY Salem	STATE MO	ZIP CODE 65401	COUNTY Dent
Wastewater Treatment Facility: Mo- 0021768 (Outfall 001 Of 001 )					
3.1 Legal Description: ¼, SE ¼, SE ¼, Sec. 12 , T 34N , R 06W (Use additional pages if construction of more than one outfall is proposed.)					
3.2 UTM Coordinates Easting (X): 628900 Northing (Y): 4168474 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)					
3.3 Name of receiving streams: Spring Creek					
<b>4.0 PROJECT OWNER</b>					
NAME Ray Walden		TELEPHONE NUMBER WITH AREA CODE (573) 729-4811		EMAIL ADDRESS administration@salememo.com	
ADDRESS 410 N. Iron St.		CITY Salem	STATE MO	ZIP CODE 65401	
<b>5.0 CONTINUING AUTHORITY:</b> Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.					
NAME City of Salem, MO		TELEPHONE NUMBER WITH AREA CODE (573) 729-4811		EMAIL ADDRESS administration@salememo.com	
ADDRESS 410 N. Iron St.		CITY Salem	STATE MO	ZIP CODE 65560	
5.1 A letter from the continuing authority, if different than the owner, is included with this application. <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A					
5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.					
A. Is a copy of the certificate of convenience and necessity included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO					
5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.					
A. Is a copy of the as-filed restrictions and covenants included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO					
B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO					
C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO					
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO					
<b>6.0 ENGINEER</b>					
ENGINEER NAME / COMPANY NAME Ken Campbell P.E. / CM Archer Group, P.C.		TELEPHONE NUMBER WITH AREA CODE (573) 364-6362		EMAIL ADDRESS kcampbell@cmarcher.com	
ADDRESS 310 E. 6th St.		CITY Rolla	STATE MO	ZIP CODE 65401	
<b>7.0 PROJECT OWNER:</b> I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.					
PROJECT OWNER SIGNATURE 					
PRINTED NAME Ray Walden				DATE 7/12/18	
TITLE OR CORPORATE POSITION Administrator of Salem, MO		TELEPHONE NUMBER WITH AREA CODE (573) 729-4811		EMAIL ADDRESS administration@salememo.com	
Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM P.O. BOX 176 JEFFERSON CITY, MO 65102-0176					
<b>END OF PART A.</b>					
<b>REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.</b>					

**SIGN HERE**