

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 Honorable E. Colleen South
Mayor
The City of Wayland
PO Box 282
Wayland, MO 63472

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.

December 26, 2018
Effective Date

December 25, 2020
Expiration Date


Edward B. Galbraith, Director, Division of Environmental Quality


Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed construction is to install three (3) additional center-pivot style surface irrigation units in the fields directly adjacent and west of the wastewater treatment facility in order to convert the whole treatment facility to a no-discharge system.

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 Four Points Land Surveying & Engineering on September 5, 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 Northeast Regional Office per 10 CSR 20-7.015(9)(E)2.
5. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment.
6. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.
7. Wastewater treatment facility shall not be located within one hundred feet (100'), and preferably three hundred feet (300') of any water well or water supply structure.
8. 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.
9. 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.
10. Upon completion of construction:
 - A. The City of Wayland will become the continuing authority for operation, maintenance, and modernization of these facilities;
 - B. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications;
 - C. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit modification be issued.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The City recognizes that “no-discharge” is likely the most reasonable option to achieve compliance with the ammonia effluent limits that are in their operating permit at renewal in 2013. A farmer approached the City about constructing an irrigation system to have a reliable source of water for crops during dry periods. The City proposed to install additional surface center-pivot style irrigation systems. This would allow all of the effluent to be land applied, thus converting the current discharging system to a no-discharge system.

2. FACILITY DESCRIPTION

The Wayland Wastewater Treatment Facility consists of a three-cell lagoon with part of the effluent irrigated by means of a center-pivot style irrigation system during the summer months. The facility has a design flow of 50,000 gallons per day and an actual flow of 25,000 gallons per day. This facility discharges to a tributary to Fox River. The current single consumptive center-pivot irrigation system is located directly south of the treatment facility. This system consists of a floating pump in the lagoon, pump controls, distribution piping, a center pivot, and center pivot controls.

The proposed construction is to install three (3) additional center-pivot style surface irrigation units in the fields directly adjacent and west of the wastewater treatment facility in order to convert the whole treatment facility to a no-discharge system. The current irrigation system most likely will be abandoned after this proposed construction.

The Wayland WWTF is located at ¼ mile Northeast of Des Moines Street and Avondale Street intersection, Wayland City, in Clark County, Missouri. The facility has a design average flow of 50,000 gpd and serves a hydraulic population equivalent of approximately 500 people.

3. COMPLIANCE PARAMETERS

The 2014 operating permit renewal contains a schedule of compliance to meet Ammonia effluent limitations of 3.7 mg/L summer daily maximum, 1.4 mg/L summer monthly average, 7.5 mg/L winter daily maximum, and 2.9 mg/L winter monthly average. The permittee will not have to meet these ammonia limits for irrigated effluent. The facility will have to monitor the following for the irrigation system: storage basin freeboard, precipitation, irrigation period, volume irrigated, application area, application rate.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

- Storage lagoon – the city will use its existing 3-cell lagoon system as storage. The total storage volume is 8,057,302 gallons (Cell #1 of 3,732,776 gallons; Cell #2 of 3,705,362 gallons; Cell #3 of 619,165 gallons). The storage capacity is 161 days for dry weather design flow and 125 days for design flow with 1-in-10 year wet weather flows. The three (3) cells of the lagoon system for Wayland are connected by valves. Cell #1 connects to Cell #2 through a series of piping and valves in order to be able to regulate the level in them. Cell #2 is connected to Cell #3 through another set of valves. The discharge to the stream from Cell #3 will be shut off after this project.
- Land Application Pump Station – replace the current floating pump in the cell 2 with a 10 HP B3EMP Berkley pump in order to transfer treated wastewater from Lagoon Cell No.2 to the land application site. The new pump is capable of operating at 450 gpm at 75 feet of TDH and supply all three (3) center pivots, but one at a time. The three (3) 2 HP end gun pumps will be provided at the end of irrigation arms.
- Geohydrologic Evaluation indicated that the soil at the proposed land application site is moderately permeable, slopes are less than 4%, and no observed bedrock onsite. There are no sinkholes, springs, previously identified underground mines or geologic structures within five miles of the site. Surface water from this site flows south to Fox Creek which is exhibits gaining characteristics.
- Application rates are 0.02 inch/hour, 0.04 inch/day, 0.31 inches/week, and 23.14 inches/year. Storage capacity (8,507,302 gallons) during dry weather is 161 days and storage with 1-in-10 year flows is 125 days with 1 foot of freeboard for each cell.
- Land Application Sites – Three (3) leased land application sites (20 years agreement) are approximately 41.7 acres with row crops. Three (3) center-pivot style surface irrigation systems will be installed in the unfenced sites but only one pivot will operate at a time. The existing irrigation system is going to be abandoned. The field directly to the northwest of the lagoon is identified as the North Irrigation System that covers 11.9 acres. The field directly to the southwest of the lagoon is identified as the South Irrigation System that covers 7.1 acres. The field directly to west of North Irrigation System is identified as the West Irrigation System that covers 22.7 acres.

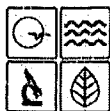
- Wastewater Irrigation – Center Pivots – All irrigation equipment is to be provided by the Reinke Irrigation Company. The North center pivot will be a model E2060-G/57 irrigation system with a radius of 423 ft in length and an end gun. A 2 HP end gun booster pump (SR100) has a maximum end throw distance of 116 feet. The design flow of the North system is 300 gpm and an end gun flow of 101 gpm. The South center pivot will be a model E2060-G/57 irrigation system with a radius of 404 ft in length and an end gun. A 2 HP end gun booster pump (SR100) has a maximum end throw distance of 116 ft. The design flow of the North system is 350 gpm and an end gun flow of 88.4 gpm. The West center pivot will be a model E2060-G/57 irrigation system with a radius of 783 ft in length and an end gun. A 2 HP end gun booster pump (SR100) has a maximum end throw distance of 97.1 ft. The design flow of the North system is 300 gpm and an end gun flow of 50.75 gpm.

5. OPERATING PERMIT

Operating permit MO-0053457 will require a modification to reflect the construction activities. The modified Wayland WWTF, MO-0053457, was successfully public noticed from October 30, 2018 to November 29, 2018 with no comment received. Submit the Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit modification be issued.

Lei Hou, PE
Engineering Section
lei.hou@dnr.mo.gov

AP 30584
CP0002029



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
**APPLICATION FOR CONSTRUCTION PERMIT -
WASTEWATER FACILITY**

RECEIVED

SEP 05 2018

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED \$1000.00	CHECK NO. 17536
DATE RECEIVED 9-5-18	

Water Protection Program

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: 2016 ☐ 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

City of Wayland Surface Irrigation

2.2 PROJECT DESCRIPTION

The city of Wayland currently disposes of a portion of their wastewater by a single center-pivot style surface irrigation rig set on a local land owner's field. The city is looking to build three (3) additional center-pivot rigs in order to land apply all wastewater and cease discharging to waters of the state. These new pivots will give the city roughly 41.7 acres of additional irrigation area.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

2.4 DESIGN INFORMATION

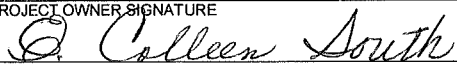
- A. Current population: 494; Design population: 500
- B. Actual Flow: 38,000 gpd; Design Average Flow: 50,000 gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: 50,000 gpd;
Design Wet Weather Event: _____

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

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3.0 WASTEWATER TREATMENT FACILITY					
NAME City of Wayland WWTF		TELEPHONE NUMBER WITH AREA CODE (660) 754-6132		EMAIL ADDRESS	
ADDRESS (PHYSICAL) 1/4 mile NE of Des Moines St x Avondale St		CITY Wayland		STATE MO	ZIP CODE 63472
COUNTY Clark					
Wastewater Treatment Facility: Mo- 0053457 (Outfall 001 Of 1)					
3.1 Legal Description: 1/4, SE 1/4, SE 1/4, Sec. Sec. 3 , T 65N , R 6W (Use additional pages if construction of more than one outfall is proposed.)					
3.2 UTM Coordinates Easting (X): 619763 Northing (Y): 4472750 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)					
3.3 Name of receiving streams: Tributary to Fox River					
4.0 PROJECT OWNER					
NAME City of Wayland		TELEPHONE NUMBER WITH AREA CODE (660) 754-6132		EMAIL ADDRESS	
ADDRESS 105 S. Main, PO B0x 282		CITY Wayland		STATE MO	ZIP CODE 63472
5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.					
NAME City of Wayland		TELEPHONE NUMBER WITH AREA CODE (660) 754-6132		EMAIL ADDRESS	
ADDRESS 105 S. Main, PO Box 282		CITY Wayland		STATE MO	ZIP CODE 63472
5.1 A letter from the continuing authority, if different than the owner, is included with this application. ☐ YES ☐ NO ☐ N/A					
5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.					
A. Is a copy of the certificate of convenience and necessity included with this application? ☐ YES ☐ NO					
5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.					
A. Is a copy of the as-filed restrictions and covenants included with this application? ☐ YES ☐ NO					
B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? ☐ YES ☐ NO					
C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? ☐ YES ☐ NO					
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☐ YES ☐ NO					
6.0 ENGINEER					
ENGINEER NAME / COMPANY NAME Kyle Pociask/Four Points Land Surveying&Engineering		TELEPHONE NUMBER WITH AREA CODE (573) 406-5533		EMAIL ADDRESS kyle@fourpointssurvey.com	
ADDRESS 17 Northport Plaza		CITY Hannibal		STATE MO	ZIP CODE 63401
7.0 PROJECT OWNER: 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 E. Colleen South				DATE Aug. 07, 2018	
TITLE OR CORPORATE POSITION Mayor		TELEPHONE NUMBER WITH AREA CODE 660-754-6961		EMAIL ADDRESS	
Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM P.O. BOX 176 JEFFERSON CITY, MO 65102-0176					
END OF PART A. REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.					

PART B – LAND APPLICATION ONLY

(Submit only if the proposed construction project includes land application of wastewater.)

8.0 FACILITY INFORMATION

8.1 Type of wastewater to be irrigated: ☐ Domestic ☐ State/National Park ☐ Seasonal business
☒ Municipal ☐ Municipal with a pretreatment program or significant industrial users
☐ Other (explain)

8.2 Months when the business or enterprise will operate or generate wastewater:
☒ 12 months per year ☐ Part of the year (list months):

8.3 This system is designed for:
☒ No-discharge ☐ Subsurface
☐ Partial irrigation when feasible and discharge rest of time
☐ Irrigation during recreational season, April – October, and discharge during November – March
☐ Other (explain)

9.0 STORAGE BASINS

9.1 Number of storage basins: 3 (Use additional pages if greater than two basins.)

9.2 Type of basins: ☐ Steel ☐ Concrete ☐ Fiberglass ☒ Earthen ☐ Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

Basin #1: Length <u>350</u>	Width <u>379.83</u>	Depth <u>5</u>	Freeboard <u>2</u>	Depth	Safety	% Slope <u>3.00</u>
Basin #2: Length <u>500</u>	Width <u>264.89</u>	Depth <u>5</u>	Freeboard <u>2</u>	Depth	Safety	% Slope <u>3.00</u>
Basin #3: Length <u>242.25</u>	Width <u>100</u>	Depth <u>5</u>	Freeboard <u>2</u>	Depth	Safety	% Slope <u>3.00</u>

9.4 Storage Basin operating levels (report as feet below emergency overflow level).
Basin #1: Maximum operating water level 7 ft Minimum operating water level 2 ft
Basin #2: Maximum operating water level 7 ft Minimum operating water level 2 ft
Basin #3: Maximum operating water level 7 ft Minimum operating water level 2 ft

9.5 Design depth of sludge in storage basins.
Basin #1: ft Basin #2: ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: ft Basin #2: ft

9.7 Total design sludge storage: dry tons and cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Type of land application: ☐ Fixed Head Sprinklers ☒ Center Pivot ☐ Traveling Gun ☐ Drip Dispersal
☐ Subsurface Low Pressure Pipe ☐ Other (describe)

10.2 Number of irrigation sites 3 Total Acres 41.7 Maximum % field slopes
Location: 1/4, 1/4, 1/4, Sec. T R County Acres
Location: 1/4, SE 1/4, SE 1/4, 30 Sec. 65N T 6W R Clark County 7.1 Acres
Location: 1/4, NE 1/4, SE 1/4, 30 Sec. 65N T 6W R Clark County 11.9 Acres
(Use additional pages if greater than three irrigation sites.) Location: NW 1/4, SE 1/4, 30 Sec, 65N T, 6W R, Clark County, 22.7 Acres

10.3 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☒ Row crops
☐ Other (describe)

10.4 Wastewater flow (dry weather) gallons per day: Average annual 13,870,000
Seasonal Off-season

10.5 Land application rate (design flow including 1-in-10 year storm water flows):
Design: 16.2 inches/year 0.002 inches/hour 0.04 inches/day 0.31 inches/week
Actual: 12.3 inches/year 0.001 inches/hour 0.03 inches/day 0.24 inches/week

10.6 Total irrigation per year (gallons): Design: 18,250,000 gal Actual: 13,870,000 gal

10.7 Actual months used for irrigation (check all that apply):
☐ Jan ☐ Feb ☒ Mar ☒ Apr ☒ May ☒ Jun ☒ Jul ☒ Aug ☒ Sep ☒ Oct ☒ Nov ☐ Dec

10.8 Land application rate is based on:
☒ Hydraulic Loading ☐ Other (describe)
☐ Nutrient Management Plan (N and P) If N and P is selected, is the plan included? ☐ YES ☐ NO