

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



**CONSTRUCTION PERMIT**

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

Briarwood Action Association  
1 Stonegate Drive  
DeSoto, MO 63020

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.

January 22, 2019  
Effective Date

  
Edward B. Galbraith, Director, Division of Environmental Quality

January 21, 2021  
Expiration Date

  
Chris Wieberg, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

Proposed construction includes a new disinfection system to consist of a Norweco Bio-Dynamic® tablet chlorinator, a baffled chlorine contact tank that will allow for more than a 15-minute contact time during peak flow, and a Norweco Bio-Dynamic® dechlorination chamber. The disinfection system will discharge through the existing discharge piping and outfall.

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 complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

### **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 Cochran Engineering on November 16, 2018 and revised December 26, 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 Saint Louis 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. Briarwood Action Association 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; and
  - 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 existing operating permit includes a schedule of compliance to meet final effluent limits for *E. coli* by July 1, 2019. Disinfection equipment is being installed to meet the schedule of compliance

### **2. FACILITY DESCRIPTION**

The existing facility is an extended aeration package plant that was provided by Masterson & Associates, serving a development with approximately 93 homes in Briarwood Estates and a couple of hundred additional lots available for future growth. The collection system is predominantly a force main system, with grinder pumps at individual homes. Installation of a new tablet chlorination and dechlorination system is proposed to meet disinfection requirements.

The Briarwood Estates WWTF is located at 1 Stonegate Drive, DeSoto, in Jefferson County, Missouri. The facility has a design average flow of 35,000 gpd and serves a hydraulic population equivalent of approximately 350 people. Actual flow is approximately 12,000 gallons per day.

### **3. COMPLIANCE PARAMETERS**

The facility is being upgraded to meet final effluent limits for *E. coli* of 1,030 #/100 mL daily maximum and 206 #/100 mL monthly average during the recreational season from April 1 through October 31. The proposed project is required to also meet final effluent limits of <130 µg/L daily maximum and <130 µg/L monthly average for total residual chlorine and is required to monitor daily minimum and monthly average minimum for dissolved oxygen as established in the modification to Operating Permit MO-00120871 to be placed on public notice.

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

#### **Construction will cover the following items:**

- Disinfection – Disinfection is the process of removal, deactivation, or killing of pathogenic microorganisms.
  - Tablet Chlorinator – Installation of a tablet Norweco Bio-Dynamic® Model XT 2000-S or approved equal chlorination tablet feeder receiving clarified effluent prior to the chlorine contact tank. The tablet chlorinator shall have a design flow of 20,000 gpd and a maximum flow of 100,000 gpd. Actual flow for this facility is approximately 12,000 gallons per day. The system will dispense hypochlorite as the wastewater comes into contact with the tablets.
  - Chlorine Contact Tank – Installation of two pre-cast concrete tank

- approximately 6 ft x 8.5 ft x 5 ft total depth with 3 concrete baffles allowing for a greater than 40:1 length to width ratio. This tank will allow for approximately 16 minutes of contact time during a peak flow of 98.5 gpm (141,750 gpd).
- Tablet Dechlorinator – Installation of a tablet Norweco Bio-Dynamic® Model XT 2000-S or approved equal dechlorination tablet feeder receiving the chlorinated effluent and prior to Outfall No. 001. The tablet dechlorinator shall have a design flow of 20,000 gpd and a maximum flow of 100,000 gpd. Actual flow for this facility is approximately 12,000 gallons per day. The system will dispense sodium sulfite as the wastewater comes into contact with the tablets.

## **5. OPERATING PERMIT**

Operating permit MO-0120871 will require a modification to reflect the construction activities. The modified Briarwood Estates WWTF, MO-0120871 operating permit will be placed on public notice concurrently with construction permit issuance. Upon construction completion, 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.

Cailie Carlile, P.E.  
Engineering Section  
[cailie.carlile@dnr.mo.gov](mailto:cailie.carlile@dnr.mo.gov)

CP0002044

RECEIVED

NOV 16 2018

AP 31221

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

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

11-16-18

83

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: \_\_\_\_\_  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  
WasteWater Treatment Facility Disinfection Report

2.2 PROJECT DESCRIPTION  
Two detention cells linked together including chlorination tubes at the entry point and de-chlorination tubes located at the effluent end,

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION  
Lienced sludge hauler (Kings Septic) used for removal of sludge on regular basis.

2.4 DESIGN INFORMATION  
A. Current population: 104; Design population: 350  
B. Actual Flow: 12,000 gpd; Design Average Flow: 35,000 gpd;  
Actual Peak Daily Flow: 12,000 gpd; Design Maximum Daily Flow: 35,000 gpd;  
Design Wet Weather Event: 35,000 gpd

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  
\$ 48,000.00

**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: \_\_\_\_\_ (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 \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Depth \_\_\_\_\_ Safety \_\_\_\_\_ % Slope \_\_\_\_\_  
 Basin #2: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Depth \_\_\_\_\_ Safety \_\_\_\_\_ % Slope \_\_\_\_\_

9.4 Storage Basin operating levels (report as feet below emergency overflow level).  
 Basin #1: Maximum operating water level \_\_\_\_\_ ft Minimum operating water level \_\_\_\_\_ ft  
 Basin #2: Maximum operating water level \_\_\_\_\_ ft Minimum operating water level \_\_\_\_\_ 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 \_\_\_\_\_ Total Acres \_\_\_\_\_ Maximum % field slopes \_\_\_\_\_  
 Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
 Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
 Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
 (Use additional pages if greater than three irrigation sites.)

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

10.4 Wastewater flow (dry weather) gallons per day: Average annual \_\_\_\_\_  
 Seasonal \_\_\_\_\_ Off-season \_\_\_\_\_

10.5 Land application rate (design flow including 1-in-10 year storm water flows):  
 Design: \_\_\_\_\_ inches/year \_\_\_\_\_ inches/hour \_\_\_\_\_ inches/day \_\_\_\_\_ inches/week  
 Actual: \_\_\_\_\_ inches/year \_\_\_\_\_ inches/hour \_\_\_\_\_ inches/day \_\_\_\_\_ inches/week

10.6 Total irrigation per year (gallons): Design: \_\_\_\_\_ gal Actual: \_\_\_\_\_ 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

**3.0 WASTEWATER TREATMENT FACILITY**

NAME Briarwood Action Association		TELEPHONE NUMBER WITH AREA CODE (636) 209-7154	EMAIL ADDRESS Briarwoodestatescommunity.com	
ADDRESS (PHYSICAL) #1 Stonegate Dr.	CITY DrSoto	STATE MO	ZIP CODE 63020	COUNTY Jefferson

Wastewater Treatment Facility: Mo- 0120871 (Outfall 1 Of 1 )

3.1 Legal Description: SE ¼, SW ¼, NE ¼, Sec. 33, T 40N, R 4E  
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 3809231 Northing (Y): 09034495  
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Tributary to Ball Branch (u)

**4.0 PROJECT OWNER**

NAME Briarwood Action Association		TELEPHONE NUMBER WITH AREA CODE (636) 209-7154	EMAIL ADDRESS Briarwoodestatescommunity.com	
ADDRESS #1 Stonggate Dr.	CITY DeSoto	STATE MO	ZIP CODE 63020	

**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 Briarwood Action Association		TELEPHONE NUMBER WITH AREA CODE (636) 209-7154	EMAIL ADDRESS Briarwoodestatescommunity.com	
ADDRESS #1 Stonegate Dr.	CITY DeSoto	STATE MO	ZIP CODE 63020	

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 Cochran Engineering		TELEPHONE NUMBER WITH AREA CODE (636) 584-0540	EMAIL ADDRESS www.cochran.com	
ADDRESS 530A East Independence	CITY Union	STATE MO	ZIP CODE 63084	

**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

*Joshua D. Brower*

PRINTED NAME  
Joshua D. Brower

DATE  
11/7/18

TITLE OR CORPORATE POSITION

President

TELEPHONE NUMBER WITH AREA CODE  
(314) 973-4209

EMAIL ADDRESS  
joshuabrower@hotmail.com

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.**