

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Clear Creek Subdivision, LLC
6322 Highway F
Palmyra, MO 63461

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

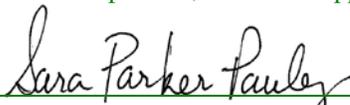
Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

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.

August 31, 2016
Effective Date


Sara Parker Pauley, Director, Department of Natural Resources

August 30, 2018
Expiration Date


John Madras, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

A Moving Bed Bioreactor (MBBR) system will be installed ahead of the existing recirculating sand filter (RSF). Testing will be done to determine if the RSF is needed to achieve final permitted effluent limits. If not, the system will not use the RSF. If the RSF is needed, the MBBR system will discharge to the RSF for further treatment prior to ultraviolet disinfection.

New pipe will be laid to redirect influent sewer main to the opposite end of the sand filter system. A 6' x 6' x 6' concrete selector tank for flow splitting will be installed ahead of the MBBR tanks.

Three 6' x 12' x 12' deep concrete MBBR tanks will be installed. Media will be installed initially in the center MBBR tank only as the other two tanks will not be needed initially. The tank will have 50% carrier fill. MBBR media will be Kontakt 500 or engineer-approved equal.

A 6' x 20' x 12' concrete settling tank will be installed following the MBBR tanks. Sludge is planned to be withdrawn by either an airlift pump or a centrifugal pump into a truck for hauling.

An attached and insulated mechanical room will be installed and will house two 3C-Hybrid 15 HP rotary lobe positive displacement blowers which will each have an initial capacity of 75 SCFM and a full capacity of 250 SCFM with adjustments made by reconfiguration of the belts and sheaves. Six 24" MaxAir Stainless Steel Coarse Bubble Diffusers will be installed in the center tank at a depth of 9', and will be installed in the other two tanks when they are put into use. Each diffuser will provide a normal airflow range of 0-25 SCFM and peak airflow of 36 SCFM.

Removable roof panels will be installed over the influent flow splitter tank, MBBR tanks, settling tank, and mechanical room.

Testing will be done to determine if the RSF is needed to achieve final treatment limits. If it is not, the RSF will not be used. If the RSF is needed, then the media and dispersion lines will be replaced. The existing recirculation tank for the RSF will be abandoned in place and the existing filter drains will be drained to the UV system. Twenty existing 1 1/2" PVC SCH 80 distribution laterals eight will be removed and replaced with eight new 1 1/2" PVC SCH 80 distribution laterals with 1/16" holes spaced on 2 foot centers on the bottom of the laterals, with holes offset between adjacent laterals and laterals spaced 5' apart. Top filter media will be replaced with 40" of media, with 4" over the top of the distribution laterals, and leaving 6" of freeboard to the top of the wall filter.

The existing UV system is already sized to handle the full buildout flow for this subdivision.

The project will also include general site work appropriate to the scope and purpose of the project.

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 Klingner & Associates P.C. on February 3, 2016 and revised August 19, 2016.
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. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, “Grants and Loans”
6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). “There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.”

7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.
 - A. Sewer mains shall be laid at least 10 in horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10 ft separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 in above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 lb per square inch to assure water tightness.
 - B. Manholes should be located at least 10 ft horizontally from any existing or proposed water main.
 - C. Manholes shall be located with the top access at or above grade level.
 - D. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
 - a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
 - b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends 10 feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.
8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one 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 www.dnr.mo.gov/env/wpp/epermit/help.htm. See www.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 www.dnr.mo.gov/env/wpp/401/ for more information.
10. Upon completion of construction;
 - A. The Clear Creek Homeowner's Association will become the continuing authority for operation, maintenance, and modernization of these facilities;
 - B. 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; and
 - C. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications; and

IV. REVIEW SUMMARY

1. AMMONIA

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at <http://dnr.mo.gov/pubs/pub2481.pdf>.

The selected treatment technology will be capable of meeting the 2013 EPA Ammonia criteria estimated effluent limits. During the antidegradation review process, the facility elected to build a treatment plant that meets the expected limits and that provides a high level of treatment to potentially reduce the need to upgrade in the near future.

2. CONSTRUCTION PURPOSE

The original construction permit for this facility was issued for three recirculating sand filter (RSF) beds. The owner elected to construct the RSF beds in phases to manage costs. Only one bed is currently installed. With recent EPA and DNR memos about lower ammonia effluent limits and recent inspections and notices of violation reports, as well as an Abatement Order on Consent for non-compliance with ammonia effluent limits, the owner decided to explore the options for treatment at this facility and decided on an MBBR system. The system will be designed to meet the ultimate built out capacity of 45,000 gpd for the subdivision.

3. FACILITY DESCRIPTION

The existing facility consists of a STEP system, recirculating sand filter sized to treat 15,000 gpd, and a UV disinfection system sized to treat 45,000 gpd. The new facility will include an MBBR system designed to treat 45,000 gpd from a population equivalent of 688. Testing will be done to determine if the existing RSF is needed after the MBBR to meet final effluent limits.

The subdivision has 88 residential lots, 21 condominium lots, and 11 commercial lots, with 45 lots currently having residential structures.

4. COMPLIANCE PARAMETERS

After this construction project, the facility is expected to meet effluent limits of 15 mg/L weekly average and 10 mg/L monthly average for BOD₅ and TSS, 1.7 mg/L daily maximum and 0.6 mg/L monthly average for summer ammonia, and 5.6 mg/L daily maximum and 2.1 mg/L monthly average for winter ammonia.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Total BOD load is calculated as 103.7 lb BOD/day for the 45,000 gpd design flow. The media will have a protected surface area of 113 ft²/ft³. Each of the three MBBR tanks will have 50% carrier fill and will be 12' x 6' with a water depth of 10 feet. The system will treat approximately 0.85 lb. BOD₅/day/1,000 ft² of media protected surface area (4.15 g BOD/day/m² of media) and 0.26 gpm/1000 ft² of media protected surface area.

6. OPERATING PERMIT MODIFICATION

Operating permit MO-0132861 will require a modification to reflect the construction activities. The operating permit modification was on public notice from July 15, 2016 through August 15, 2016 and no comments were received. Upon construction completion 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.

MO-0132861

AY 22815

CP0001822

015765

RECEIVED

FEB - 3 2016



MISSOURI DEPARTMENT OF NATURAL RESOURCES

WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT -

WASTEWATER FACILITY

Water Protection Program

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FREE RECEIVED	CHECK NO.
\$1000.00	1056
DATE RECEIVED	
2-3-16	

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. 1.4.)
- 1.5 [Complete only if answered Not Applicable on No. 1.3.] 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

Clear Creek WWTF Upgrade

2.2 PROJECT DESCRIPTION

Addition of a moving bed bioreactor (MBBR) with selector tank, aeration, two blowers, settling tank and related piping ahead of the existing sand filter treatment system. Existing sand filter will have media replaced and piping adjustments to become a tertiary filter ahead of the existing UV system.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge is retained in septic tanks and is contract hauled periodically. Remaining sludge from the MBBR treatment process will be removed by contract hauling via truck to the Hannibal WWTP.

2.4 DESIGN INFORMATION

- A. Current population: 166; Design population: 746
- B. Actual Flow: 14k gpd; Design Average Flow: 45k gpd;
Actual Peak Daily Flow: 45k gpd; Design Maximum Daily Flow: 45k gpd; Design Wet Weather Event: N/A

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

\$ 100,000.00

3.0 WASTEWATER TREATMENT FACILITY

NAME Clear Creek WWTF		TELEPHONE NUMBER WITH AREA CODE (573) 248-6396	EMAIL ADDRESS sales@clearcreekproperties.net	
ADDRESS (PHYSICAL) 8870 Highway W	CITY Hannibal	STATE MO	ZIP CODE 63401	COUNTY Marion

Wastewater Treatment Facility: Mo- 0132861 (Outfall 001 Of 001)

3.1 Legal Description: NW ¼, SE ¼, NW ¼, Sec. 14 , T 57N , R 5W
(Use additional pages if construction of more than one outfall is proposed.)3.2 UTM Coordinates Easting (X): 63461 Northing (Y): 440075
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Unnamed tributary to Clear Creek

4.0 PROJECT OWNER

NAME Clear Creek Subdivision, LLC		TELEPHONE NUMBER WITH AREA CODE (573) 248-6396	EMAIL ADDRESS sales@clearcreekproperties.net	
ADDRESS <u>217 Victoria Park Ave</u>	CITY <u>Foristell</u>	STATE MO	ZIP CODE <u>63348</u>	

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 Clear Creek Homeowner's Association		TELEPHONE NUMBER WITH AREA CODE (573) 248-6396	EMAIL ADDRESS sales@clearcreekproperties.net	
ADDRESS <u>217 Victoria Park Ave</u>	CITY <u>Foristell</u>	STATE MO	ZIP CODE <u>63348</u>	

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 NOB. 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 NOC. 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 NOD. 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 Mark C. Bross, PE/ Klingner & Associates, PC		TELEPHONE NUMBER WITH AREA CODE (573) 221-0020	EMAIL ADDRESS mcb@klingner.com	
ADDRESS 4510 Paris Gravel Road	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 Tory Smith	DATE <u>1/28/2016</u>
----------------------------	--------------------------

TITLE OR CORPORATE POSITION Owner	TELEPHONE NUMBER WITH AREA CODE (573) 248-6396	EMAIL ADDRESS sales@clearcreekproperties.net
--------------------------------------	---	---

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: _____ (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&P) If N&P is selected, is the plan included? YES NO