

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

VIKING VALLEY ASSOCIATION
144 E. Main St
Gallatin, MO 64640

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.

July 23, 2024
Effective Date

July 22, 2026
Expiration Date



John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction of an aerated pretreatment unit (Singular BioKinetic 960-750), followed by ~377 lineal feet of 4-inch Sch 40 PVC gravity pipe with cleanouts, a 1,500-gallon pump tank with one 1.0-HP dosing pump capable of operating at 25 gpm at 148 feet of TDH. The pump tank will include a GeoFlow Biodisc filter and a three-zone K-Rain indexing valve. Flow will be pumped to a ~ 6,000 ft², three-zone, subsurface soil dispersal system with a total of up to 24 dosings per day, with soil imported to ensure at least 12-inches of vertical separation to the limiting layer. The maximum soil acceptance rate will be 0.1 gallons per day (gpd) per square foot (gpd/ft²). An interceptor drain and berm will be installed upflow of the dispersal field. The treatment system will be designed for a daily flow of 500 gpd to serve a sewer section of a seasonal recreational vehicle park and a shower house that serves an additional unsewered section of the campground. The design average flow is estimated based on measured water use for the entire park. The new subsurface distribution system will replace “Lagoon 04”, which is one of three existing storage basins. The existing design flow of 13,860 gpd for the entire park will not change.

A closure plan will need to be submitted to the Northeast Regional Office for review and approval prior to any closure activities.

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

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 consistent with plans and specifications signed and sealed by Christopher E. Nothstine, P.E., with Tall Guy Waste Water Solutions & Soils, LLC, 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 Northeast Regional Office per 10 CSR 20-7.015(9)(G).
5. The completed project shall be field tested to verify actual pumped volume of each dose. The timer controls shall be set to ensure a dosing rate not to exceed the allowable rate of 0.1 gpd/ft².
6. 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 dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. See dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting for more information.
7. In accordance with 10 CSR 20-6.010(12), a full closure plan shall be submitted to the department's Northeast Regional Office for review and approval of any permitted wastewater treatment system being replaced. The closure plan must meet the requirements outlined in Standard Conditions Part III of the Missouri State Operating Permit No. MOG823115. Closure shall not commence until the submitted closure plan is approved by the department.
8. 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 100- year flood elevation. 10 CSR 20-8.140(2)(B)
 - Unless another distance is determined by the Missouri Geological Survey or by the department's Public Drinking Water Branch, the minimum distance between wastewater treatment facilities and all potable water sources shall be at least 300 feet. 10 CSR 20-8.140(2)(C)1.
 - No treatment unit with a capacity of 22,500 gpd or less shall be located closer than the minimum distance of 50 feet to a neighboring residence for this subsurface system. See 10 CSR 20-2.010(68) for the definition of a residence. 10 CSR 20-8.140(2)(C)2.

- Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.140(2)(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.
- 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.
- A means of flow measurement shall be provided at all wastewater treatment facilities. 10 CSR 20-8.140(7)(E)
- All wastewater treatment facilities must have a screening device, comminutor, or septic tank for the purpose of removing debris and nuisance materials from the influent wastewater. 10 CSR 20-8.150(2)
- A septic tank must have a minimum capacity of at least 1,000 gallons. 10 CSR 20-8.180(2)(A)
- Subsurface systems shall—
 - Exclude un-stabilized fill and soils that have been highly compacted and/or disturbed, such as old roadbeds, foundations, or similar things; 10 CSR 20-8.200(7)(A)1.A.
 - Provide adequate surface drainage where slopes are less than 2 percent; 10 CSR 20-8.200(7)(A)1.B.
 - Provide surface and subsurface water diversion where necessary, such as a curtain or perimeter drain; 10 CSR 20-8.200(7)(A)1 C. and
 - Have a 10 foot buffer from the property line. 10 CSR 20-8.200(7)(A)1.D.
- The vertical separation between the bottom of the drip lines and/or the trench and a limiting layer, including but not limited to, bedrock; restrictive horizon; or seasonal high water table, shall be no less than:
 - Twelve inches for systems dispersing secondary or higher quality effluent; 10 CSR 20-8.200(7)(A)2.B.
- Subsurface systems shall be, at a minimum, preceded by preliminary treatment. 10 CSR 20-8.200(7)(B)
- Loading rates shall not exceed the values assigned by the site and soil evaluation. 10 CSR 20-8.200(7)(C)

- The location and size of the drains and buffers must be factored into the total area required for the drip dispersal system. 10 CSR 20-8.200(9)(A)1.
- The drip dispersal lines shall be placed at a minimum depth of six inches below the surface. 10 CSR 20-8.200(9)(B)1.
- Emitters and drip dispersal lines shall be placed at a minimum on a two foot spacing to achieve even distribution of the wastewater and maximum utilization of the soil. 10 CSR 20-8.200(9)(B)2.

9. Upon completion of construction:

- A. The VIKING VALLEY ASSOCIATION will become the continuing authority for operation and maintenance 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 Statement of Work Completed form to the department in accordance with 10 CSR 20-6.010(5)(N) (dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155) and request the operating permit be issued. The Form B and modification fee were received on March 27, 2024.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

Construction is to upgrade one of three existing treatment systems. The department's March 31, 2023, compliance inspection report stated that Lagoon 04, a single-cell storage basin, is only three feet deep and does not have sufficient freeboard available. The intent of this project is to provide proper a treatment system.

2. FACILITY DESCRIPTION

The Viking Valley Association – Campground 1 currently consists of three storage basins and a wastewater irrigation field. The total design average flow is reportedly 13,860 gpd. The existing insufficient system (Lagoon 04) includes a single septic tank followed by a single-cell storage basin. A small part of the existing collection system will be reused, but the septic tank and “Lagoon 04” storage basin will be closed.

Construction will include a Singulair BioKinetic 960-750 aerated pretreatment unit, followed by ~ 377 lineal feet of 4-inch Sch 40 PVC gravity pipe with cleanouts, followed by a 1,500-gallon pump tank with one 1.0-HP dosing pump capable of operating at 25 gpm at 148 feet of TDH. The pump tank will include a GeoFlow Biodisc filter and a three-zone K-Rain indexing valve, with flow pumped to a three-zone, ~6,000 ft², subsurface soil dispersal system with a total of up to 24 dosings per day. Soil will be imported to ensure at least 12-inches of vertical

separation to the limiting layer. The maximum soil acceptance rate will be 0.1 gpd/ft². An interceptor drain and berm will be installed upflow of the dispersal field to minimize surface runoff and groundwater infiltration to the field. The treatment system will be designed for a daily flow of 500 gpd to serve a sewer section of a seasonal recreational vehicle park and a shower house that serves an additional unsewered section of the campground. The design average flow is estimated based on 15 percent of the measured water use for the entire park.

The Viking Valley Association Campground 1 WWTF is located southeast of Lake Viking, along Lake Viking Terrace, in Lake Viking, Daviess County, Missouri. The new treatment system (to replace “Lagoon 04”) will have a design average flow of 500 gpd and serve a hydraulic population equivalent of approximately 5 people based on 100 gpd/capita. [10 CSR 20-9.020(1)(D)]. Based on the 2023 facility plan, the entire campground had 159 RVs, with no expected growth and a typical 90 percent capacity, a peak average water usage of 89,200 gallons per month during June and July of 2022 (or ~2,973 gpd average), and with the facility occupied only from March to November. The contributing area for the system to be replaced includes 24 RVs (12 sewer and 12 unsewered but assumed to be using the nearby bathhouse). The contributing flow was therefore assumed to be ~15 percent of the total flow (24/159). Therefore, the new system would need to handle a capacity of at least 446 gpd (ultimately with a design average flow of 500 gpd). Storage basins 1 & 2 and their associated land application field will remain to handle the remaining flow from the rest of the campground.

3. COMPLIANCE PARAMETERS

The proposed project is required to meet the requirements of MOG823. No effluent limits will be required for this new drip-distribution system. The permittee will still need to report other system according to the issued MOG823115.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- Storage basins 1 & 2, as well as their associated land application field will remain.

Construction will cover the following items:

- Components are designed for 500 gpd to serve a Population Equivalent of 5, based on hydraulic loading to the system and based on 100 gpd/capita. [10 CSR 20-9.020(1)(D)]
- Aerated Treatment Unit – Installation of one NORWECO-Singulair BioKinetic Wastewater Treatment Unit (Model 960-750). The 1,600-gallon unit includes a pretreatment chamber, an extended aeration chamber, and a final clarification chamber with two Bio-Kinetic effluent filters. The unit is rated for 750 gpd to

allow for some flow equalization during peak times and to ensure adequate pretreatment prior to drip irrigation.

- Flow Measurement – Installation of accurate flow measurement devices will give the treatment facility a means of improved data analysis.
 - This is a no-discharge subsurface dispersal system. Flow measurement, if needed, would be by pump run times.
- Drip Distribution Pump Station – Construction of a 1,500-gallon, simplex pump tank to dose treated wastewater to the drip distribution field, with a 1.0-HP pump capable of operating at 25 gpm at 148 feet of TDH. The tank capacity will allow for some flow equalization during peak times. A GeoFlow Biodisc filter and a 3-zone K-Rain indexing valve will also be installed in the dosing tank.
- Subsurface Soil Dispersal System – The soils at this site are rated for 0.1 gpd/ft² on the entire dispersal area. Soil morphology review was conducted during the facility plan review and on-site soils were determined to be acceptable for this drip dispersal system. The soil investigation was completed by Chris Stiens, Certified Soil Scientist with Stines Soil Evaluations, LLC, on June 20, 2023.
 - Soils Report. The soils investigation reports that there were three pits dug over the proposed dispersal site. All three soil test pits had a surface soil that was described as clay loam with an application rating of 0.1 gpd/ft². However, Pits # 1 and 2 (representing the main dispersal area) showed that there was only about six inches of acceptable soil at the site. There was also a seasonal, perched water table at a depth of 14 inches. The top one inch of vegetated soil will be removed, and seven inches of additional soil will be imported to the site. Specifications for placement of the fill prescribe a specific range of acceptable soil moisture content and the type of construction equipment (tracked) to be used to avoid over compaction. At least six inches of additional soil will cover the drip lines for protection.
 - Drip – The facility has selected the GeoFlow subsurface drip dispersal system. The system will dose three zones at a conservative hydraulic loading rate of 0.1 gpd/ft², which provides up to 24 dosings per day. Each zone is ~ 2,000 ft², for a total of ~ 6,000 ft² total dispersal area. Air release valves with vacuum breakers will be installed. The drip field area includes a total of ~ 3,011 linear feet of ½-inch ID GeoFlow tubing, installed at least 6-inches deep, fitted with emitters every 2 ft. Supply and return manifolds will be 1¼-inch PVC pipe.
 - Imported Soil - The facility will have to import an estimated 260 cubic yards of soils, which must be approved by the engineer before placement, and shall be sandy loam, silt loam, loam, or loamy sand containing less than 10 percent clay and less than 15 percent organic, as described by the USDA. This meets the requirements of the GeoFlow design recommendations for importing soils.
 - The existing clay layer as discussed in the soils report and geohydrologic evaluation would likely cause ponding and lateral water movement within the soil profile if water is overapplied, not allowing for migration to groundwater. With the use of imported soils, the depth of the soil column is being increased to provide at least 12 inches of vertical separation,

- giving an additional volume of soil material for final treatment of the effluent effectively creating better conditions for treatment than with only using the in-place soil material.
- The dispersal field will be protected from surface and seasonal ground water with installation of an interceptor drain and berm upflow of the dispersal field. The interceptor drain will include washed gravel backfill above a 4-inch perforated tile.
- Emergency Power – A portable generator will be obtained as needed to operate the treatment facility in event of power failure.

5. OPERATING PERMIT

Operating permit MOG823115 will require an internal modification to reflect the construction activities. After completion of the construction project submit:
(1) Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(N) and request the operating permit modification be issued and
(2) As-builts if the project was not constructed in accordance with previously submitted plans and specifications. An application Form B and modification fee has already been submitted. Missouri State Operating Permit, General Permit MOG823115, will be issued after receipt of the above documents.

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: ahc.mo.gov

Scott Adams, P.E.
Engineering Section
scott.adams@dnr.mo.gov



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

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED 1,000	CHECK NO. 12844
DATE RECEIVED 3-27-24 YMH	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Treatment Facility 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 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
 YES Date of Approval: _____ N/A
- 1.3 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: 1-16-24 NO (If No, complete No. 1.4.)
- 1.4 [Complete only if answered No on No. 1.3.] Is a copy of the facility plan* for wastewater treatment facilities included with this application?
 YES NO Exempt because _____
- 1.5 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
- 1.6 Is a summary of design* included with this application? YES NO
- 1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
 YES Date of submittal: _____
 Enclosed is the appropriate operating permit application and fee submittal. Denote which form: A B B2
 N/A: However, In the event the department believes that my operating permit requires revision to permit limitation such as changing equivalent to secondary limits to secondary limits or adding total residual chlorine limits, please share a draft copy prior to public notice? YES NO
- 1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? YES NO
- 1.9 Is the appropriate fee or JetPay confirmation included with this application? YES NO
 See Section 7.0

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

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT Viking Valley Association Campground 1, Lagoon 04 replaced with on-site system	2.2 ESTIMATED PROJECT CONSTRUCTION COST \$ 40000
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2.3 PROJECT DESCRIPTION
 The project proposes to design and install a new drip system to include pre-treatment with an aerobic treatment unit certified to meet NSF40 requirements. The ATU would be followed by a pump tank providing time dosed dispersal to a drip dispersal field.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
 Water from Lagoon 04 would be pumped into the ATU/drip system for treatment and dispersal. After allowing the lagoon bottom to dry significantly, the lagoon would be carefully filled with soil, taking care to NOT ALLOW pond sludge to surface during the process.

2.5 DESIGN INFORMATION

A. Current population: 20; Design population: 20

B. Actual Flow: 446 gpd; Design Average Flow: 500 gpd;
 Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: 500 gpd; Design Wet Weather Event: _____

2.6 ADDITIONAL INFORMATION

A. Is a topographic map attached? YES NO

B. Is a process flow diagram attached? YES NO



3.0 WASTEWATER TREATMENT FACILITY

NAME Viking Valley Association		TELEPHONE NUMBER WITH AREA CODE 660-322-9001	E-MAIL ADDRESS manager@lakevikingmo.net	
ADDRESS (PHYSICAL) 144 E Main Street	CITY Gallatin	STATE MO	ZIP CODE 64640	COUNTY Daviss

Wastewater Treatment Facility: Mo- G823115 (Outfall - Of -)

3.1 Legal Description: SE 1/4, SE 1/4, SE 1/4, Sec. 17, T 59N, R 28W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 401176.70 Northing (Y): 4419011.23
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: design includes on-site subsurface dispersal (no outfall)

4.0 PROJECT OWNER

NAME Viking Valley Association		TELEPHONE NUMBER WITH AREA CODE 660-322-9001	E-MAIL ADDRESS manager@lakevikingmo.net	
ADDRESS 144 E Main Street	CITY Gallatin	STATE MO	ZIP CODE 64640	

5.0 CONTINUING AUTHORITY: A continuing authority is a company, business, entity or person(s) that will be operating the facility and/or ensuring compliance with the permit requirements.

NAME Viking Valley Association		TELEPHONE NUMBER WITH AREA CODE 660-322-9001	E-MAIL ADDRESS manager@lakevikingmo.net	
ADDRESS 144 E Main Street	CITY Gallatin	STATE MO	ZIP CODE 64640	

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 Tall Guy Waste Water Solutions & Soils, LLC		TELEPHONE NUMBER WITH AREA CODE 660-224-9043	E-MAIL ADDRESS chris@tallguypoils.com	
ADDRESS 609 W 1st Street	CITY Maryville	STATE MO	ZIP CODE 64468	

7.0 APPLICATION FEE

CHECK NUMBER JETPAY CONFIRMATION NUMBER

8.0 PROJECT OWNER: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE
Viking Valley Association, [Signature]

PRINTED NAME
Viking Valley Association

TITLE OR CORPORATE POSITION
Lake Director

TELEPHONE NUMBER WITH AREA CODE
660-322-9001

E-MAIL ADDRESS
manager@lakevikingmo.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.