STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Nathan Graessle, P.E.
Design Engineer
Missouri Department of Natural Resources
Division of State Parks
P.O. Box 176
Jefferson City, MO 65102

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 30 2023
Effective Date

August 29, 2025
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

This project consists of a low pressure pipe subsurface system with a new manhole, two septic tanks, dosing tank, and lateral field. The new wastewater treatment facility (WWTF) has a design flow of 4,561 gallons per day (gpd). This design flow includes additional wastewater from the upgraded 28 campsites that provide water and sewer services. The project also includes the existing storage basin closure, existing lift station pump modifications, and force main extensions.

A closure plan will need to be submitted to the Kansas City 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 WWTF.

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 make a "finding of affordability". Per Section 644.145.3, a "finding of affordability" is a statement as to whether or not an individual or household would be required to make unreasonable sacrifices in order to make the projected monthly payments for sewer services. While this facility is a publicly-owned treatment works, the permittee accomplishes capital improvements through an established budget or operation and maintenance and not through the issuance of utility bills to customers for sewer services. Because of this, the Department cannot determine the "affordability" of the new permit requirements.

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 Valerie Holland, P.E, with Bartlett & West on May 26, 2023, and the addendum dated July 19, 2023, 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 Kansas City 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 0.25 gallons per square foot per day.

6. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment.

7. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the one hundred- (100-) year flood elevation per 10 CSR 20-8.140(2)(B).The minimum distance between wastewater treatment facilities and all potable water sources shall be at least three hundred feet (300') per 10 CSR 20-8.140(2)(C)1.

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 https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. See https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting for more information.

9. A United States Army Corps of Engineers (USACE) Clean Water Act Section 404 Department of the Army permit and a Section 401 Water Quality Certification issued by the Department may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied or notification is provided that no Section 404 permit is required by the USACE. You must contact your local USACE district since they determine what waters are jurisdictional and which permitting requirements may apply. You may call the Department's Water Protection Program, Operating Permits

Section at 573-522-4502 for more information. See https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality for more information.

10. In accordance with 10 CSR 20-6.010(12), a full closure plan shall be submitted to the Department's Kansas City 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. MO-0129259. Closure activities shall not commence until the submitted closure plan is approved by the Department.

11. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.

- A drop pipe shall be provided for a sewer entering a manhole at an elevation of twenty-four inches (24") or more above the manhole invert. 10 CSR 20-8.120(4)(A)1.

- No sewer, service connection, or drop manhole pipe shall discharge onto the surface of the bench. 10 CSR 20-8.120(4)(D).

- Manholes shall be watertight, constructed, and installed in accordance with the manufacturer's recommendations and procedures. 10 CSR 20-8.120(4)(E).

- Vacuum testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C1244 – 11(2017) *Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill*, as approved and published April 1, 2017, or the manufacturer's recommendation [See 10 CSR 20-8.120(4)(F)1.]. This standard shall hereby be incorporated by reference into this rule, as published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. This rule does not incorporate any subsequent amendments or additions. 10 CSR 20-8.120(4)(F)1.

- Exfiltration testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C969 – 17 *Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines*, as approved and published April 1, 2017 [See 10 CSR 20-8.120(4)(F)2.]. This standard shall hereby be incorporated by reference into this rule, as published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. This rule does not incorporate any subsequent amendments or additions. 10 CSR 20-8.120(4)(F)2.

- Force main system shall be designed to withstand all pressures (including water hammer and associated cyclic reversal of stresses), and maintain a velocity of at least two feet per second. 10 CSR 20-8.130(8)(A).

- 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.

- 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.

- 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 one thousand (1,000) gallons. 10 CSR 20-8.180(2)(A)

- The septic tank shall be baffled. 10 CSR 20-8.180(2)(B)

- Subsurface systems shall—
    - Exclude unstabilized fill and soils that have been highly compacted and/or disturbed, such as old road beds, foundations, or similar things; 10 CSR 20-8.200 (7)(A)1.A.
    - Provide adequate surface drainage where slopes are less than two 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 ten 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:
    - Twenty-four inches (24"); 10 CSR 20-8.200(7)(A)2.A.

- 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)

- All network piping and low pressure distribution piping and fittings with polyvinyl chloride (PVC) shall meet ASTM Standard D 1785 *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, or 120* as approved and published August 1, 2015, or equivalent rated to meet or exceed ASTM D2466 *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings* as approved and published August 1, 2017. These standards shall hereby be incorporated by reference into this rule, as published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. This rule does not incorporate any subsequent amendments or additions. 10 CSR 20-8.200(8)(A)2.

- Manifold design for LPP systems shall address freeze protection while assuring uniform distribution and to minimize drain down of laterals into other laterals at a lower elevation between dosing events. 10 CSR 20-8.200(8)(A)3.

- The orifice number and spacing shall be designed to provide a distribution of no more than six square feet per orifice with an orifice size of not less than one-eighth inch. 10 CSR 20-8.200(8)(C)1.

12. Upon completion of construction:

    A. The Division of State Parks will become the continuing authority for operation and maintenance of these facilities;

    B. Submit an electronic copy of the as-built plans 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) (https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155) and $75 permit modification fee to the Engineering Section of the Water Protection Program 60 days prior to operation. Identify that the application is for a General permit for land application of domestic wastewater, MO-G823.

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The new low pressure pipe subsurface system will replace the existing lagoon system.

2. FACILITY DESCRIPTION

The Big Lake State Park WWTF is located at 204 Lake Shore Drive, Craig, in Holt County, Missouri.

The existing WWTF serving Big Lake State Park (Park) is a two-cell storage basin. Sludge is retained in the storage basin. Accumulated wastewater is hauled to another permitted WWTF to prevent discharge. Wastewater generated from the Park is from 76 camping sites, eight camper cabins, a park host residence, two shower houses, and backwash water from a swimming pool. The design flow for this existing WWTF is 7,900 gpd. The collection system consists of gravity sewers, force main, and two lift stations. In 2022, the Park upgraded 28 camping sites to provide water and sewer services for the sites.

The state park is proposing to replace the existing storage basin with a no-discharge subsurface soil dispersal system. The new WWTF has a design average flow of 4,561

gpd and serves a hydraulic population equivalent (PE) of approximately 40 people based on 100 gallons per capita per day. This design flow includes additional wastewater from the 28 upgraded camp sites that provide water and sewer services. The maximum daily flow for this WWTF is 11,487 gallons per day.

3. COMPLIANCE PARAMETERS

The operating permit, MO-0129259, is for a two-cell storage basin and a swimming pool. The Big Lake State Park no longer uses the swimming pool and this project will replace the two-cell storage basin system. The storage basin will be closed.

The new subsurface disposal system will be required to meet the requirements of MOG823 General operating permit with the expiration date of August 24, 2027.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

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

- The North Lift Station – This existing lift station will be used to deliver the received wastewater from the cabin area to the influent manhole of the new WWTF via a 4-inch force main. Each of the two existing pumps of this lift station is capable of pumping 87.5 gallons per minute (gpm) at 50.5 total dynamic head (TDH).

- The South Lift Station – This existing lift station will be used to deliver the received wastewater from the office, campground, and dump station areas to the influent manhole of the new wastewater treatment facility via a 2-inch force main. The existing 4.5-inch impeller of each of the two existing pumps will be replaced with a new 4-inch impeller. Each of the modified pumps will be capable of delivering 77 gpm at 38 TDH.

Construction will cover the following items:

- Components are designed for a design flow of 4,561 gallons per day with a maximum daily flow of 11,487 gallons per day.

- North Force Main – Construction of approximately 1,365 lineal feet of 4-inch Class 200 PVC pipe. This new force is connected to an existing 4-inch force main and used to deliver wastewater from the North Lift Station to the influent manhole of the new subsurface system.

- South Force Main – Construction of approximately 216 lineal feet of 2-inch Class 200 PVC pipe. This new force main is for the South Lift Station and will convey the wastewater from the South Lift Station to the influent manhole of the new subsurface system.

- Influent Manhole – Construction of a 4-foot diameter manhole with a drop pipe assembly to receive wastewater from the North and South Lift Stations.

- Septic Tanks – There are two septic tanks connected in series to provide storage and treatment of the wastewater. Tank 1 has a capacity of 10,000 gallons and Tank 2 has a capacity of 8,000 gallons. These tanks provide passive primary treatment as the settleable solids in raw wastewater settle onto the bottom of the tank. Wastewater from Tank 2 then flows to the dosing tank.

- Dosing Tank – Construction of an 8,000-gallon dosing tank to pump primary treated wastewater to the subsurface soil dispersal system. The dosing tank has four (4) – 2 HP submersible pumps – each capable of pumping 55.5 gallons per minute (gpm) at 70.8 ft TDH. The pumps transfer wastewater to 12 separate zones of the subsurface soil dispersal system via an indexing valve.

- Subsurface Soil Dispersal System – The soils at this site are rated for 0.25 gallons per day per square foot (gpd/sf). Soil morphology review was conducted during the construction permit application review and onsite soils were determined to be acceptable for this system. The soil investigation was completed by Chris Stiens, Certified Soil Scientist with Stiens Soil Evaluations, LLC, on March 3, 2023.

    - Soils Report. In the soils investigation, there were 4 pits dug over the proposed site.
        - Pits 1 and 2 had silty clay and an apparent shallow water table and therefore were not suitable for conventional or low pressure piping (LPP) treatment.
        - Pits 3 and 4 were both suited for LPP system with Pit 4 being the better location of the two. They were rated at 0.25 gallons per square foot per day. The area near pit 4 was chosen for the new subsurface system.

    - Hydraulic loading rate used in the design was at 0.25 gallons per square foot per day.

    - Low Pressure Piping (LPP) – The low pressure piping is divided into 12 zones.
        - Each zone has 12 lateral lines with each lateral being 64 linear feet of 1.25-inch Schedule 40 PVC pipe.
        - The lateral spacing is 6-foot off center with the orifices spaced at 5 feet apart, for a total of 11 orifices per lateral with 1/8 inch orifice openings.
        - The total area for loading is 45,948 square feet.

5. OPERATING PERMIT

After completion of construction project submit: statement of work completed, as-built plans if the project was not constructed in accordance with previously submitted plans and specifications, and $75 operating permit modification fee. Missouri State Operating Permit, General Permit MO-G823, will be issued after receipt of the above documents.

V. NOTICE OF RIGHT TO APPEAL

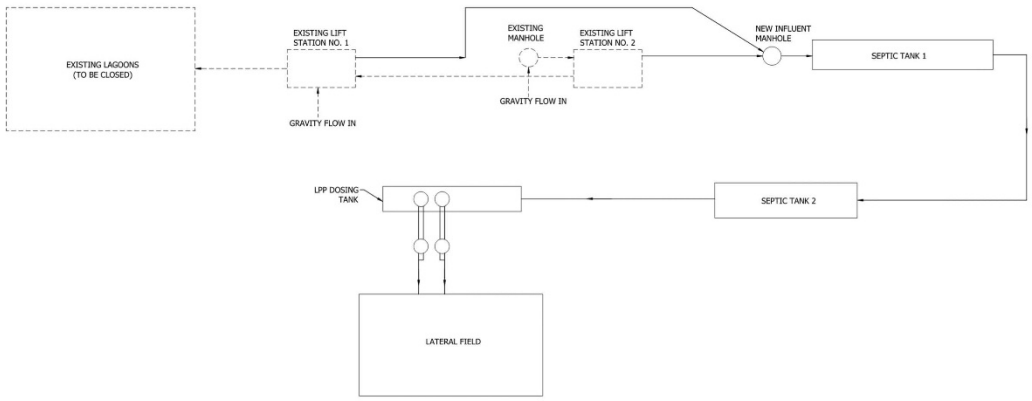
If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, 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: https://ahc.mo.gov

Sieu T. Dang, P.E.
Engineering Section
sieu.dang@dnr.mo.gov

APPENDIX

- **Process Flow Diagram**



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	CHECK NO.
DATE RECEIVED	

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: _____ ☑ 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
Big Lake State Park Wastewater Treatment Facility Improvements

2.2 ESTIMATED PROJECT CONSTRUCTION COST
$ 1,204,000

2.3 PROJECT DESCRIPTION
This project consists of a subsurface irrigation wastewater treatment system with a new manhole, two septic tanks, dosing tank and lateral field. It also includes closure of the existing lagoon and existing lift station pump modifications and forcemain extensions.

2.4 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Storage in the septic tanks and haul offsite to a wastewater treatment facility.

2.5 DESIGN INFORMATION

A. Current population: _____; Design population: 59

B. Actual Flow: 6900 gpd; Design Average Flow: 7900 gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: _____ 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	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
MDNR, Big Lake State Park	573-751-5360	nathan.graessle@dnr.mo.gov

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
204 Lake Shore Drive	Craig	MO	64437	Holt

Wastewater Treatment Facility: Mo- 0129259 (Outfall Of)

3.1 Legal Description: ____ ¼, ____ ¼, ____ ¼, Sec. 18, T 61N, R 39W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 300225 Northing (Y): 4439244
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: NA

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
MDNR, Division of State Parks	573-751-5360	nathan.graessle@dnr.mo.gov

ADDRESS	CITY	STATE	ZIP CODE
P.O. Box 176	Jefferson City	MO	65102

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	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Same as Owner		

ADDRESS	CITY	STATE	ZIP CODE

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	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Valerie Holland, P.E./Bartlett & West	573-659-6714	valerie.holland@bartwest.com

ADDRESS	CITY	STATE	ZIP CODE
601 Monroe Street, Suite 201	Jefferson City	MO	65101

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: Nathan Graessle

PRINTED NAME	DATE
Nathan Graessle	11/17/2022

TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Design Engineer	573-751-5360	nathan.graessle@dnr.mo.gov

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.
☐ 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 three 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 _____
Basin #3: 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
Basin #3: 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 Basin #3: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.7 Total design sludge storage: _____ dry tons and _____ cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 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.)

10.2 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops
☐ Other (describe) _____

10.3 Wastewater flow (dry weather) gallons per day: Average annual _____ Seasonal _____ Off-season _____

10.4 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

10.5 Total irrigation per year (gallons): Design: _____ gal Actual: _____ gal

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

10.7 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