

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Boone County Commission
1314 North 7th Street
Columbia, MO 65201

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.

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.

March 4, 2024
Effective Date

March 3, 2026
Expiration Date


John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

This project consists of installing grinder pumps at each residence and discharging the wastewater from the grinder pump to a common low pressure force main located adjacent to Bolli Road. This common force main would connect to the Midway School force main and ultimately convey wastewater to the Midway Crossing Wastewater Treatment Facility (WWTF). The existing septic tanks and lagoon will be decommissioned per Boone County regulations. The project will also include general site work appropriate to the scope and purpose of the project.

Construction and installation of approximately 890 linear feet 3-inch diameter high-density polyethylene (HDPE) low-pressure sewer main; 1,400 linear feet of 1.5 inch diameter HDPE discharge line; and 300 linear feet of 4-inch diameter house service line. All necessary appurtenances shall be included to make a complete and usable wastewater collection system to serve an estimated population equivalent of 37 and an estimated design average flow of 3,700 gallons per day.

The project consists of installing 10 simplex grinder pumps units with a 50-gallon capacity. The grinder pumps shall be capable of delivering 5 gallons per minute (gpm) against a total dynamic head (TDH) of 180 feet and 30 gpm at 140 feet TDH.

These activities will be in the vicinity of Bolli Road Residential Subdivision, south of US Route 40 in Boone County and discharge to an existing sewer system to be treated at the Midway Crossing WWTF, Missouri State Operating Permit No. MO-0132705.

II. 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 HDR Engineering, Inc., signed and sealed by Bryce Banion, P.E. on January 31, 2024, and approved by the department on March 4, 2024.
3. Regulation 10 CSR 20-4.040(18)(B)1 requires that projects be publicly advertised, allowing sufficient time for bids to be prepared and submitted. Projects should be advertised at least 30 days prior to bid opening.
4. 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 project or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

5. As per 10 CSR 20-4.040, all changes in contract price or time within the approved scope of work must be by change order in accordance with Section 19 of this rule.
6. Manholes shall be located with the top access at or above grade level.
7. 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 electronic Sanitary Sewer Overflow/Bypass Reporting system at <https://dnr.mo.gov/mogem/> or Northeast Regional Office per 10 CSR 20-7.015(9)(G).
8. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(5), which includes by reference the provisions of 10 CSR 23-3.010. Separation distance requirements between water mains and sanitary sewers in 10 CSR 60-10.010 are also applicable.
9. 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.
10. A United States Army Corps of Engineers (USACE) Section 404 Department of Army permit (§404) along with the department's Section 401 Water Quality Certification or waiver (§401) 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 likely be required. Since the USACE makes determinations on what is jurisdictional, you must contact the USACE to determine permitting requirements. See <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality> for more information or you may contact the department's Water Protection Program at 573-522-4502 or wpssc401cert@dnr.mo.gov.
11. Upon completion of construction:
 - A. The Boone County Commission 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;

- C. Submit the enclosed Statement of Work Completed form to the department in accordance with 10 CSR 20-6.010(5)(N). When the receiving facility applies for their next operating permit renewal, they will be expected to include updated information about the sanitary sewer collection system on their application.

Abdallah Elyamni
Financial Assistance Center
Clean Water Section, Engineering Unit
Abdallah.elyamni@dnr.mo.gov

APPENDICES

Appendix A - Summary of Design
Appendix B - Project Map
Appendix C - Collection System Design Calculations

APPENDIX A – SUMMARY OF DESIGN

Summary of Design
Bolli Road NID Wastewater Improvements
Boone County Regional Sewer District
September 12, 2023

Background

The Boone County Commission (County Commission) has formed a Neighborhood Improvement District (NID) for a residential subdivision comprised of 10 single-family homes located along Bolli Road, south of US Route 40.

Most of the 10 homes are currently served by onsite septic tank systems. However, at least two of the homes discharge wastewater into a lagoon located on another landowner's property east of the Bolli Road Subdivision. Complaints by this property owner led to the formation of the NID by the County Commission.

Selected Alternative

The selected alternative consists of installing grinder pumps at each residence and discharging the wastewater from the grinder pump to a common low pressure force main located adjacent to Bolli Road. This common force main would connect to the Midway School Force Main and ultimately convey wastewater to the Midway Crossing Wastewater Treatment Facility (WWTF). The existing septic tanks and lagoon will be decommissioned per Boone County regulations.

The grinder pumps will be located on private property with the District retaining a Right of Entry Agreement with each property owner for future maintenance.

Wastewater Flows

The conveyance system improvements for the Bolli Road NID Wastewater Improvements Project (Project) were sized using the EPA's probable number of pumps operating simultaneously. The EPA methodology allows for 4 pumps operating simultaneously within the entire low pressure sewer system, which is comprised of 1 pump at the Midway Elementary School, 1 pump at the Rollingwood Plat No. 1 Pump Station and 10 residential grinder pumps in the Bolli Road Subdivision.

System Design

Two separate pumping conditions for the entire system were evaluated as follows:

Condition 1 (1 Pump On in the Bolli Road Subdivision)

Required Residential Grinder Pump: 32 GPM with Total Dynamic Head of 89 - 92 FT

Condition 2 (Midland School and Rollingwood Pumps are On and 2 Pumps On in the Bolli Road Subdivision)

Required Residential Grinder Pump: 20 GPM with Total Dynamic Head of 118 - 129 FT

Grinder Pump Tank Storage

Each residential grinder pump tank will provide 50 gallons of storage.

Pipe Parameters

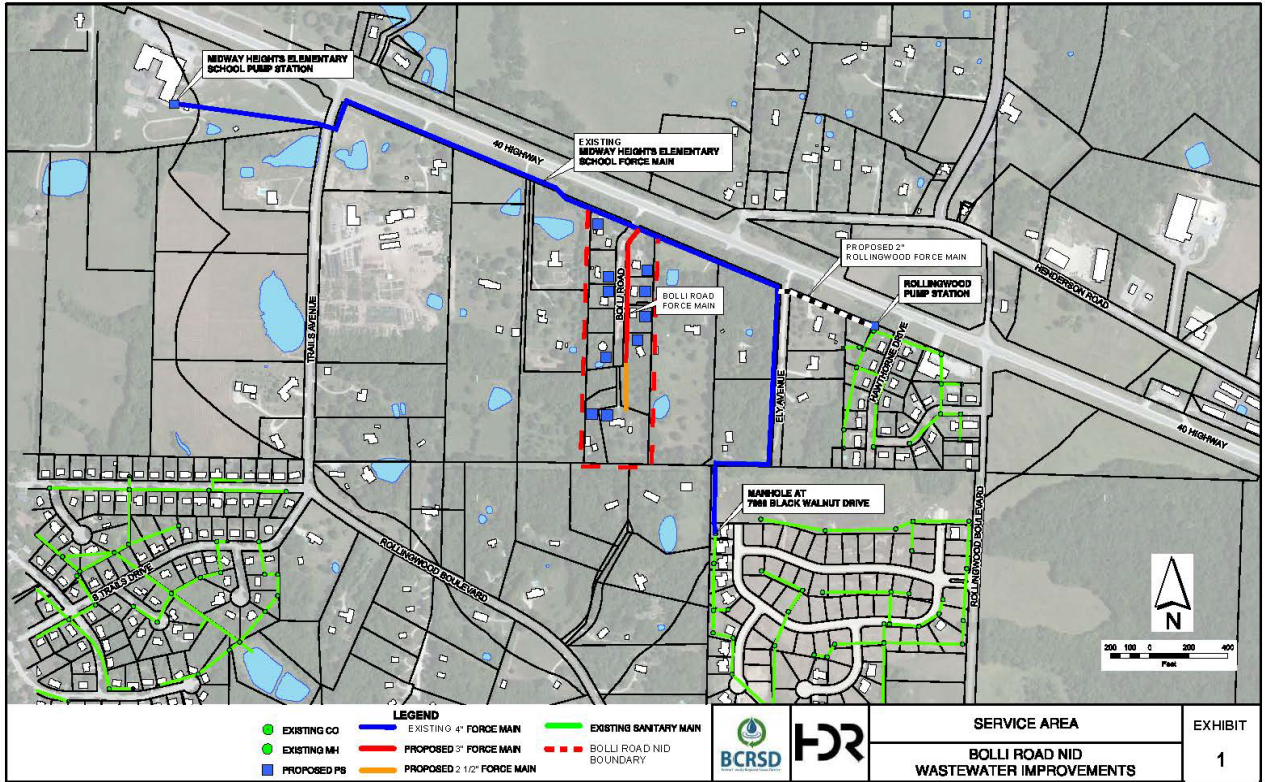
The piping improvements will be constructed in dedicated easements in accordance with the District's preference. The service lines from the grinder pumps to the Bolli Road Force Main will be 1.5-inches in diameter. The southern portion of the Bolli Road Force Main will be 2.5-inches in diameter and the northern portion will be 3-inches in diameter.

The parameters for the pipes with the maximum probable pumps running are shown in the Table below.

Pipe Parameters

Pipe	Flow (gpm)	Diameter (in)	Velocity (fps)	Comments
Service Line	32	1.5	4.29	Proposed Bolli Road Pipe
Force Main	60	2.5	3.51	Proposed Bolli Road Pipe
Force Main	120	3	4.74	Proposed Bolli Road Pipe
Force Main	167	4	3.99	Existing Midland School Pipe

APPENDIX B - PROJECT MAP



APPENDIX C – COLLECTION SYSTEM DESIGN CALCULATIONS

**Boone County Regional Sewer District
Bollie Road NID LPS
Design Calculations
25-Jan-23**

One Bolli Road Pump (School Pump and Rollingwood PS Off)

Static Lift

Ground Elevation Lowest Pump (ft)	686.00
Assumed Water Depth at Low Water Level (ft)	8.00
Pump Off Elevation (ft)	678.00
System High Point Elevation at Sta. (ft)	758.00
Pump Static Lift Required (ft)	80.00

Length Of 1.5-inch LPS Pipe

2300 N. Bollie Road to Main (ft)	150
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Length of 3-inch Pipe

2300 N. Bollie to 40 Hwy 4" FM	1050
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Length of 4-inch FM

Bollie Road to Gravity MH	2350
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Pipe Diameter and Area

Nominal (in)	1.5
Pipe Type PVC 160 IPS Inside Diameter (in)	1.745
Pipe Area (sf)	0.02
Nominal (in)	3.0
Pipe Type PVC 160 IPS Inside Diameter (in)	3.214
Pipe Area (sf)	0.06
Nominal (in)	4.0
Pipe Type PVC 160 IPS Inside Diameter (in)	4.133
Pipe Area (sf)	0.09

System Flow - From Facility Plan

Number of Future Residences	0
Number of Existing Residences	10
Total Residences in 20 Years	10
Future Flow	0
Existing Flow - 161.67 gpd/residence - historical	1,667
Total average Day Flow (gpd)	1,667
Average Day Flow (gpm)	1.2
Peak Hour Flow (PF = 6 x Avg Day) gpm	6.9
Velocity at Design Flow (ft/s)	0.93
Estimated Bolli Rd Pump Flow From 1 pump(gpm)	32.00

Pump Head

Hazen Williams Friction Coefficient New	150
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Hazen Williams Friction Coefficient (20 Yrs)	130
1.5" PVC 160 IPS	
Friction Head Calculation (C=150)	6.0
Friction Head Calculation (C=130)	7.8
3.0" PVC 160 IPS	
Friction Head Calculation (C=150)	2.1
Friction Head Calculation (C=130)	2.8
4.0" PVC 160 IPS	
Friction Head Calculation (C=150)	1.4
Friction Head Calculation (C=130)	1.8
Total Head Loss	
Friction Head Calculation + Static Head (C=150)	89.5
Friction Head Calculation + Static Head (C=130)	92.4

Bolli Rd 2 Pump Calculations with (Rollingwood and Midway School Pump On)

Ground Elevation Lowest Pump (ft)	686.00
Assumed Water Depth at Low Water Level (ft)	8.00
Pump Off Elevation (ft)	678.00
System High Point Elevation at Sta. (ft)	758.00
Pump Static Lift Required (ft)	80.00

Length Of 1.5-inch LPS Pipe

2300 N. Bollie Road to Main (ft)	150
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Length of 3-inch Pipe

2300 N. Bollie to 40 Hwy 4" FM	1050
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Length of 4-inch FM

Bollie Road to Gravity MH	2350
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Pipe Diameter and Area

Nominal (in)	1.5
Pipe Type PVC 160 IPS Inside Diameter (in)	1.745
Pipe Area (sf)	0.02
Nominal (in)	3.0
Pipe Type PVC 160 IPS Inside Diameter (in)	3.214
Pipe Area (sf)	0.06
Nominal (in)	4.0
Pipe Type PVC 160 IPS Inside Diameter (in)	4.133
Pipe Area (sf)	0.09

System Flow - From Facility Plan

Number of Future Residences	0
Number of Existing Residences	10
Total Residences in 20 Years	10
Future Flow	0
Existing Flow - 161.67 gpd/residence - historical	1,667

Total average Day Flow (gpd)	1,667
Average Day Flow (gpm)	1.2
Peak Hour Flow (PF = 6 x Avg Day) gpm	6.9
Velocity at Design Flow (ft/s)	0.93

Estimated Bolli Rd Pump Flow from each pump(gpm)	20.00
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Note: 2 pumps running at 20 gpm each for total of 40 gpm

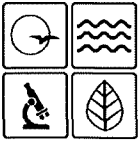
Midway School Pump Flow (gpm)	103.00
Rollingwood Pump Flow (gpm)	30.00

Pump Head

Hazen Williams Friction Coefficient New	150
Hazen Williams Friction Coefficient (20 Yrs)	130
1.5" PVC 160 IPS	
Friction Head Calculation (C=150)	2.5
Friction Head Calculation (C=130)	3.3
3.0" PVC 160 IPS	
Friction Head Calculation (C=150)	3.2
Friction Head Calculation (C=130)	4.2
4.0" PVC 160 IPS	
Friction Head Calculation (C=150)	32.1
Friction Head Calculation (C=130)	41.8

Total Head Loss

Friction Head Calculation + Static Head (C=150)	117.8
Friction Head Calculation + Static Head (C=130)	129.3

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
**APPLICATION FOR CONSTRUCTION PERMIT –
SEWER EXTENSION**

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

NOTE ► Please Read the accompanying instructions before completing this form**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: MDNR SRF Project #: C295299-03
- 1.2 Has the Department of Natural Resources approved the proposed project's engineering report*?
☒ YES Date of Approval: 1/11/2023 ☐ NO ☐ N/A
- 1.3 Is a copy of the appropriate plans* and specifications* included with this application? ☒ YES ☐ NO
If the project is using standard specifications, name of community: _____
- 1.4 Is a summary of design* included with this application? ☒ YES ☐ NO
- 1.5 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

Bolli Road NID Wastewater Improvements

ADDRESS	CITY	STATE	ZIP CODE	COUNTY
2151-2341 N. Bolli Road	Columbia	MO	65202	Boone

2.2 Legal Description: ¼, SW ¼, NW ¼, Sec. 1, T 48N, R 14W

2.3 Project Components (check all that apply):

☐ Gravity sewers ☐ Pumping stations ☒ Force mains ☐ Alternative sewer system ☒ Other (Describe below.)

2.4 PROJECT DESCRIPTION

This project is a low pressure sewer system. The project consists of installing residential grinder pumps at 10 residences in the Bolli Subdivision. Wastewater from the grinder pumps will be discharged to a new 3-inch force main, approximately 860 feet in length, located adjacent to Bolli Road. The 3-inch force main will connect to the existing Midway School Force Main which will convey the wastewater to a gravity sewer system owned and operated by the Boone County Regional Sewer District (BCRSD). The wastewater will flow to and be treated at the BCRSD Midway Crossing WWTP.

2.5 DESIGN INFORMATION

- A. Population or number of lots to be served by this extension: 10
- B. Estimated flow to be contributed by this extension: Design Average Flow: 3700 gpd Design Peak Hourly Flow: 612 gph
- C. Industrial Wastes: Type: N/A Flow: N/A gpd
- D. Receiving Sewer: Size: 8 inches Capacity: 650 gpm
- E. Does this project (check all that apply):
☒ Connect to an existing treatment plant ☒ Resolve enforcement issue ☐ Eliminate or consolidate an existing treatment plant
- F. Estimated number of onsite systems being removed: 10
- G: Estimated costs associated with piping: \$ 30,200 Estimated costs associated with lift station(s): \$ 170,000

3.0 PROJECT OWNER

NAME		TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
Boone County Regional Sewer District		573 443-2774	bcrsd@bcrsd.com
ADDRESS	CITY	STATE	ZIP CODE
1314 N 7th Street	Columbia	MO	65201

CHARTER NUMBER (SECRETARY OF STATE) or REGISTERED AGENT

N/A

4.0 CONTINUING AUTHORITY: A continuing authority is a company, business, entity, or person(s) that will be legally responsible for ensuring compliance with the permit requirements and provide continuous stable oversight of the permitted facility or activity. The Continuing authority should be a relatively permanent entity responsible for the ongoing operation, maintenance and modernization, when needed, of the permitted facility or activity. A continuing authority is not, however, an entity or individual that is contractually hired by the permittee to sample or operate and maintain the system for a defined time period, such as a certified operator or analytical laboratory. To access the regulatory requirement regarding continuing authority, 10 CSR 20-6.010(2), please visit [Clean Water Commission Chapter 6](#). A continuing authority's name must be listed exactly as it appears on the Missouri Secretary of State's (SoS's) webpage: [Missouri Secretary of State](#), unless the continuing authority is an individual(s), government entity, or otherwise not required to register with the SoS.

NAME Boone County Region Sewer District		TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
ADDRESS	CITY	STATE	ZIP CODE
CHARTER NUMBER (SECRETARY OF STATE)			

4.1 Has appropriate continuing authority acceptance been provided as follows:

A letter from the continuing authority accepting responsibility for continued maintenance of the sewer (if the continuing authority is different than the original owner of the construction), or a properly executed "Continuing Authority and Receiving Wastewater Treatment Facility Acceptance" Form 780-2584. ☐ YES ☐ NO ☒ N/A

5.0 ENGINEER

ENGINEER NAME / COMPANY NAME Bryce Banion, PE/HDR Engineering, Inc.		TELEPHONE NUMBER WITH AREA CODE 816 347-1157	EMAIL ADDRESS Bryce.Banion@hdrinc.com
ADDRESS 10450 Holmes road, Suite 600	CITY Kansas City	STATE MO	ZIP CODE 64131

6.0 RECEIVING WASTEWATER TREATMENT FACILITY

NAME BCRSD Midway Crossing WWTP		TELEPHONE NUMBER WITH AREA CODE 573 443-2774	EMAIL ADDRESS bcrsd@bcrsd.com
MISSOURI STATE OPERATING PERMIT # MO-0132705		COUNTY Boone	REMAINING CAPACITY (GPD) 127,000

6.1 If different from the owner, has a letter been provided from the receiving treatment facility demonstrating that they agree to accept the expanded flow or has a properly executed Continuing Authority and Receiving Wastewater Treatment Facility Acceptance MO 780-2584 form been provided? ☐ YES ☐ NO ☒ N/A

6.2 A letter from the receiving wastewater treatment facility, if different than the continuing authority, is included with this application. ☐ YES ☐ NO ☒ N/A

6.3 If the receiving treatment plant or continuing authority is regulated by the Public Service Commission (PSC) for sewer activities, a Certificate of Convenience and Necessity has been received? ☐ Yes - Date: ☐ No ☒ N/A

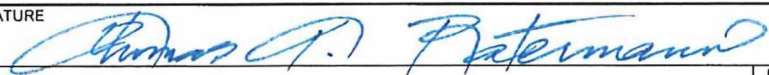
OPTIONAL QUESTIONS REGARDING MILITARY SERVICE

Have you or an immediate family member ever served in the U.S. Armed Forces?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If yes, would you like information about military-related services in Missouri?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

7.0 Application Fee

<input type="checkbox"/> Check Number	<input type="checkbox"/> JetPay Confirmation Number
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8.0 PROJECT OWNER: I certify under penalty of law this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE 		
PRINTED NAME Thomas T. Ratermann, PE		DATE February 23, 2023
TITLE OR CORPORATE POSITION General Manager	TELEPHONE NUMBER WITH AREA CODE 573 443-2775	EMAIL ADDRESS tratermann@bcrsd.com

Mail completed copy to:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
PO BOX 176
JEFFERSON CITY, MO 65102-0176


Submit completed electronic copy to:

Missouri Department of Natural Resources
at DNR.WPPEngineerSection@dnr.mo.gov

9.0 SEWER EXTENSION CHECKLIST				
SEWER EXTENSION DESIGN CERTIFICATION: Answer all questions yes or N/A. Answer N/A only if the question is clearly not applicable to the design of the proposed sewer extension.				
	REGULATION		YES	N/A
1.	8.110(3)(A)	Is the design flow based on actual flow data for an existing system?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.	8.110(3)(B)	Are average design flows, peak hourly flows and I&I contributions for new systems calculated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.	8.110(9)(B)	Is there a detailed plan showing tributary area, boundaries, pertinent elevations, topography, existing and proposed facilities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.	8.120(2)	Does the sewer exclude water from roofs, streets, groundwater from foundation drains and combined wastewater?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5.	8.120(3)(A)	Is the pipe installation, embedment and backfill designed to prevent damage to the pipe and its joints?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6.	8.120(3) (A)1	Is all sewer pipe constructed with a slope to obtain mean velocities of not less than 2 feet per second?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7.	8.120(3)(A)2	Is the pipe covered with at least 36" of soil or sufficiently insulated to prevent freezing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.	8.120(3)(B)	Is deflection testing specified to ensure no pipe exceeds a deflection of 5% of the inside diameter?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9.	8.120(4)(A)	Are manholes located at the end of each line, at all changes in grade, size or alignment and at all intersections?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10.	8.120(4)(C)	Are manholes at least 42 inches in diameter with a clear opening of 22 inches on sewer line larger than 8"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11.	8.120(4)(C)	Where cleanouts are used at the end of a lateral instead of a manhole, they are a minimum diameter of 8 inches or larger and equal to the diameter for pipes < 8"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12.	8.120(4)(E)	Are the manholes watertight, constructed and installed in accordance with the manufacturer's recommendations and procedures?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13.	8.120(4)(F)	Do the specifications include a requirement for inspection and testing for manholes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14.	8.120(5)(A)	Is the sewer free from physical connections to a potable water supply system and no water pipes come in contact with a sewer manhole?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.	8.120(5)(B)	Are sewers and manholes located at least 50 feet horizontally from any existing or proposed water supply well, sources, structures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.0 PRESSURE SEWERS, GRINDER PUMP, STEP AND STEG SEWER CHECKLIST				
	REGULATION		YES	N/A
16.	8.125(5)(A)1.	Does the cleaning velocity of ≥ 2 ft/s happen more than once per day?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17.	8.125(5)(A)2.	Is the diameter of the pressure sewer main pipe at least 1.5"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18.	8.125(5)(B)	Are appurtenances compatible with the piping system?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19.	8.125(5)(B)2.	Are isolation valves located: upstream of major pipe intersections; both sides of stream, bridge and RR crossings; at terminal end of system?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20.	8.125(5)(C)	Do service line pipes have a minimum diameter of 1.25"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
21.	8.125(5)(D)1.A .	Do simplex grinder pump stations service only a single equivalent dwelling unit (EDU)? i.e. 1 residence – 1 grinder pump.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
22.	8.125(5)(D)1.B .	Are multiple unit pump stations owned, operated and maintained by an approved continuing authority?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
23.	8.125(5)(D)3.	Is there at least 70 gallons of storage in the grinder pump unit?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
24.	8.125(5)(D)4.	Do grinder pump stations have shutoff valves, check valves and anti-siphon valves (where siphoning could occur) that are accessible from the ground surface?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
25.	8.125(5)(D)7., 8.130(3)(B)2.	Are units serviceable and replaceable under wet conditions without electrical hazard and is electrical equipment suitable for hazardous locations (National Electrical Code, Class I, Group D, Division 1 location)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26.	8.125(5)(D)8., 8.125(2)(F)6.	Are provisions in place to avoid interruption of service due to mechanical or power failure by providing standby power, storage capacity, or interconnection with another disposal system?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
27.	8.125(6)(D)	In a STEP system is at least one septic tank (1,000 gallons or more) provided for each EDU with 20% of tank volume dedicated to freeboard and ventilation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28.	8.125(6)(F)	Are duplex pumps provided for the design flow of 1,500 gallons or greater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

11.0 PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
29.	8.125(7)(C)	Is the minimum diameter sewer main pipe and service line of STEG sewer at least 4"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30.	8.130(2)(A) 8.140(2)(B)	Is the pump station designed to withstand the 100-year flood?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31.	8.130(3)(A)	Is the dry well completely separate from the wet well and is a suitable and safe means of access provided to each?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32.	8.130(3)(B)	If the design flow is 1,500 gpd or more, are there at least 2 pumps or pneumatic ejectors provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33.	8.130(3)(D)	Are valves located outside wet well unless integral to a pump or its housing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34.	8.130(3)(F) 8.140(8)(J)	Do wet and dry wells have separate ventilation systems?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35.	8.130(3)(G)	Does all potable water brought to pump stations comply with 8.140(7)(D)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36.	8.130(6)	Is an alarm system provided with uninterrupted power?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37.	8.130(7)(A)	Is there 2 hours retention of the peak hourly flow for a design flow > 100,000 gpd or 4 hrs retention of the peak hourly flow for a design flow < 100,000 gpd?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38.	8.130(7)(B)	Are there independent utility substations provided for emergency power capable of starting and operating the pump station at its rated capacity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39.	8.130(8)(A)	Is the force main velocity of ≥ 2 ft/s maintained?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40.	8.130	Are there complete operation instructions for the pumping stations provided that include emergency procedures, maintenance schedules, special tools and spare parts that may be necessary?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

12.0 SUCTION LIFT PUMP AND SUBMERSIBLE PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
41.	8.130(4)	Are the suction lift pumps of the self priming or vacuum priming type?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42.	8.130(4)(A)	Is the combined total of dynamic suction lift at the "pump off" elevation and required net positive suction head at design operating conditions less than or equal to 22 feet?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43.	8.130(4)(B)	Are there dual vacuum pumps capable of removing air from the suction lift pump?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44.	8.130(5)(A)	Are submersible pumps readily removable and replaceable without personnel entering, or disconnecting any pipe in the wet well?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

13.0 SEWER EXTENSION CHECKLIST -- CERTIFICATION STATEMENT	
<p>For any questions answered "N/A" provide an explanation. Also provide any useful general comments regarding design for review engineer.</p> <p>Section 7.0: Payment was made by credit card. The receipt is attached.</p> <p>Section 9.0</p> <p>Item 1: There is no flow data for the existing 10 individual septic tank systems.</p> <p>Items 6, 9-13: This project does not include gravity sewers or manholes.</p> <p>Section 10.0</p> <p>Item 27: This project is not a STEP system.</p> <p>Item 28: This project does not include duplex pumps.</p> <p>Section 11.0: This project does not include a pump station.</p> <p>Section 12.0: This project does not include a suction lift station or submersible pump station.</p>	
<p>Missouri Professional Engineer's seal, signature and date:</p> <div style="text-align: right;">  <p>February 24, 2023</p> </div>	
<p>Name: Bryce Banion, PE</p>	
<p>Address: 10450 Holmes Road, Suite 600</p>	
<p>City: Kansas City</p>	<p>State: MO</p>
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