### Filed 2/19/2024 OAH

COMMONWEALTH OF KENTUCKY ENERGY AND ENVIRONMENT CABINET DIVISION OF ENFORCEMENT CASE NO. DOW 24-3-0001

IN RE:

Bluegrass Water Utility Operating Company, LLC Magruder Village Water Corporation 4625 Magruder Village Kevil, KY 42053 AI No. 44397 Activity ID No. ERF20240001

### AGREED ORDER

\*\*\*\*\*

WHEREAS, the parties to this Agreed Order, the Energy and Environment Cabinet (hereinafter "Cabinet") and Bluegrass Water Utility Operating Company, LLC (hereinafter "BWUOC") state:

### STATEMENTS OF FACT

1. The Cabinet is charged with the statutory duty of enforcing KRS Chapter 224 and the regulations promulgated pursuant thereto.

2. BWUOC is an active Kentucky Limited Liability Company in good standing that owns and operates utilities and whose principal address, according to the Kentucky Secretary of State is 1650 Des Peres Road, Suite 303, St. Louis, Missouri 63131.

3. The Magruder Village Water Corporation Wastewater Treatment Plant (hereinafter "Magruder Village Water WWTP" or "facility"), is located at 4625 Magruder Village, Kevil, Kentucky 42053. The facility has a design capacity of 0.0086 million gallons per day and discharges to an unnamed tributary of Bayou Creek.

4. The facility was recently acquired in January 2024 by BWUOC. The facility's discharges are permitted under Kentucky Pollutant Discharge Elimination Systems (hereinafter

"KPDES") permit number KY0083577, issued by the Cabinet's Division of Water (hereinafter "DOW").

5. On or about October 20, 2023, the Kentucky Public Service Commission issued an order in case number 2023-00218 approving the joint application to transfer the facility to BWUOC subject to certain conditions, which the entry of an agreed order with the Cabinet requiring the repair and/or upgrading of the Magruder Village Water WWTP.

6. BWUOC has contracted with a third-party firm to produce an engineering memorandum detailing the status of and repairs needed at the facility (Exhibit A). Upon Commission approval, BWUOC has indicated to the Cabinet that it plans to make substantial repairs and/or upgrades to the facility to address the deficiencies noted in Exhibit A.

7. Upon the successful transfer pursuant to the Commission's order, BWUOC has indicated to the Cabinet that it plans to make substantial repairs and/or upgrades to the facility to address the deficiencies noted in Exhibit A.

**NOW THEREFORE,** in the interest of providing corrective actions to the facility, the parties hereby consent to the entry of this Agreed Order and agree as follows:

### REMEDIAL MEASURES

8. BWUOC shall notify the Cabinet in writing that it has assumed ownership and operation within fifteen (15) days of acquiring the facility.

Within fifteen (15) days of assuming ownership and operation of the facility,
 BWUOC shall submit a "Change in Ownership Certification" to the Cabinet.

10. At all times, commencing with assuming ownership of the facility, BWUOC shall provide for proper operation and maintenance of the facility in accordance with 401 KAR 5:065 Section 2(1).

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11. Following the initial ninety (90) days of its operation of the facility, BWUOC shall submit to the Cabinet for review and acceptance, a written Corrective Action Plan (hereinafter "CAP") to bring the facility into compliance with its KPDES permit and correct the deficiencies noted in Exhibit A. The CAP shall include, but not be limited to, an identification of actions BWUOC shall implement to ensure compliance that includes; proper operation and maintenance to its sewage treatment system, collection system, and disinfection unit. The CAP shall also include a list of all actions necessary to ensure the completion of upgrades to its facility including a list of completion dates for each action. Include in the CAP a final compliance date for completion of all remedial measures listed;

- A. Upon review of the CAP, the Cabinet may, in whole or in part, (1) accept or (2) decline and provide comments to the BWUOC identifying the deficiencies. Upon receipt of Cabinet comments, the BWUOC shall have ninety (90) days to revise and resubmit the CAP for review and acceptance. Upon resubmittal, the Cabinet may, in whole or in part, (1) accept or (2) disapprove and provide comments to the BWUOC identifying the deficiencies. Upon such resubmittal, if the CAP is disapproved, the Cabinet may deem the BWUOC to be out of compliance with this Agreed Order for failure to timely submit the CAP. The parties to this Agreed Order may also agree in writing to further extend the period in which the BWUOC and the Cabinet accept a revised and resubmitted CAP.
- B. The BWUOC may request an amendment of the accepted CAP by writing the Director of the Division of Enforcement at 300 Sower Blvd., Frankfort, Kentucky 40601 and stating the reasons for the request. If granted, the amended

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CAP shall not affect any provision of this Agreed Order unless expressly provided in the amended CAP. This does not require an amendment request pursuant to paragraph 19 of this Agreed Order.

C. Upon Cabinet acceptance of all or any part of the CAP, the amended CAP or any accepted part thereof (provided that the accepted part is not dependent upon implementation of any part not yet accepted), shall be deemed incorporated into this Agreed Order as an enforceable requirement of this Agreed Order. This does not require an amendment request pursuant to paragraph 19 of this Agreed Order.

12. So long as BWUOC is in compliance with the terms and conditions of this Agreed Order, the Cabinet's Division of Enforcement agrees to hold any formal enforcement action for numeric permit parameter violations for the KPDES permit described in paragraph 4, in abeyance. However, in the event that such numeric permit parameter violation results in immediate and irreparable harm to human health or the environment, the Cabinet may issue an Abate and Alleviate Order or seek a temporary injunction from a court. Should BWUOC fail to comply with the terms and conditions of this Agreed Order or if conditions warrant immediate relief as specified above, the Cabinet may seek formal enforcement action that would have otherwise been held in abeyance.

13. By the final compliance date in the accepted CAP, BWUOC shall be in full compliance with its KPDES permit.

14. All submittals required by the terms of this Agreed Order shall be submitted to: Division of Enforcement, Attention: Director, 300 Sower Blvd., Frankfort, Kentucky, 40601.

### MISCELLANEOUS PROVISIONS

15. This Agreed Order shall be of no force and effect unless BWUOC assumes

ownership and operations of the facility.

16. This Agreed Order addresses only the items described above. Other than the matters agreed to by entry of this Agreed Order, nothing contained herein shall be construed to waive or to limit any remedy or cause of action by the Cabinet based on statutes or regulations under its jurisdiction and BWUOC reserves its defenses thereto. The Cabinet expressly reserves its right at any time to issue administrative orders and to take any other action it deems necessary that is not inconsistent with this Agreed Order, including the right to order all necessary remedial measures, assess penalties for violations, or recover all response costs incurred, and BWUOC reserves its defenses its defenses thereto.

17. This Agreed Order shall not prevent the Cabinet from issuing, reissuing, renewing, modifying, revoking, suspending, denying, terminating, or reopening any permit to BWUOC. BWUOC reserves its defenses thereto, except that BWUOC shall not use this Agreed Order as a defense.

18. BWUOC waives its right to any hearing on the matters admitted herein. However, failure by BWUOC to comply strictly with any or all of the terms of this Agreed Order shall be grounds for the Cabinet to seek enforcement of this Agreed Order in Franklin Circuit Court and to pursue any other appropriate administrative or judicial action under KRS Chapter 224 and the regulations promulgated pursuant thereto.

19. The Agreed Order may not be amended except by a written order of the Cabinet's Secretary or her designee. BWUOC may request an amendment by writing the Director of the Division of Enforcement at 300 Sower Blvd., Frankfort, Kentucky 40601, and stating the reasons for the request. If granted, the amended Agreed Order shall not affect any provision of this Agreed Order unless expressly provided in the amended Agreed Order.

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20. The Cabinet does not, by its consent to the entry of this Agreed Order, warrant or aver in any manner that BWUOC's complete compliance with this Agreed Order will result in compliance with the provisions of KRS Chapter 224 and the regulations promulgated pursuant thereto. Notwithstanding the Cabinet's review and approval of any plans formulated pursuant to this Agreed Order, BWUOC shall remain solely responsible for compliance with the terms of KRS Chapter 224 and the regulations promulgated thereto, this Agreed Order, and any permit and compliance schedule requirements.

21. BWUOC shall give notice of this Agreed Order to any purchaser, lessee or successor in interest prior to the transfer of ownership and/or operation of any part of the facility occurring prior to termination of this Agreed Order, shall notify the Cabinet that such notice has been given, and shall follow all statutory requirements for a transfer.

22. This Agreed Order applies specifically and exclusively to the unique facilities referenced herein and is inapplicable to any other facility.

23. Compliance with this Agreed Order is not conditional on the receipt of any federal, state, or local funds.

24. This Agreed Order shall be of no force and effect unless and until it is entered by the Secretary or his designee as evidenced by his signature thereon. If this Agreed Order contains any date by which BWUOC is to take any action or cease any activity, and the Secretary enters the Agreed Order after that date, then BWUOC is nonetheless obligated to have taken the action or ceased the activity by the date contained in this Agreed Order.

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### **TERMINATION**

25. This Agreed Order shall terminate upon BWUOC's completion of all requirements described in this Agreed Order. BWUOC may submit written notice to the Cabinet when it believes all requirements have been performed. The Cabinet shall notify BWUOC in writing whether it concurs that all requirements of this Agreed Order have been completed. The Cabinet reserves its right to enforce this Agreed Order, and BWUOC reserves its right to file a petition for hearing pursuant to KRS 224.10-420(2) contesting the Cabinet's determination.

### AGREED TO BY:

Josiah Cox, President Bluegrass Water Utility Operating Company, LLC

15/02/2024

Date

### **APPROVAL RECOMMENDED BY:**

Brian Osterman, Director Division of Enforcement

Smeh E. Noth for jn

Joseph A. Newberg, General Counsel Office of Legal Services 2/19/24

Date

02.19.24

Date

### ORDER

Wherefore, the foregoing Agreed Order is entered as the final Order of the Energy and Environment Cabinet this <u>19th</u> day of <u>February</u>, 202<u>4</u>.

ENERGY AND ENVIRONMENT CABINET

John S. Lyons

John S. Lyons, Deputy Secretary Authorized Designee, Rebecca W. Goodman, Secretary Energy & Environment Cabinet

### **CERTIFICATE OF SERVICE**

I hereby certify that a true and accurate copy of the foregoing AGREED ORDER was mailed, postage prepaid, to the following this <u>19th</u> day of <u>February</u>, 202<u>4</u>.

Bluegrass Water Utility Operating Company, LLC 1650 Des Peres Road, Suite 303 St. Louis, MO 63131

And mailed, messenger te: Electronically mailed to:

Brian Osterman, Director Division of Enforcement 300 Sower Blvd. Frankfort, Kentucky 40601

Joseph A. Newberg, General Counsel Office of General Counsel Energy and Environment Cabinet 300 Sower Blvd. Frankfort, Kentucky 40601

DOCKET COORDINATOR

Distribution: DOW Exhibit A

GIS Mapping

Potable Water

Wastewater Treatment

21 DESIGN Civil Site Design Construction Support Transportation Wastewater Collection

Magruder Village – Wastewater (KY-0083577) Woodville, KY Engineering Memorandum Date: April 18, 2023

### Introduction

The Magruder Village Wastewater Treatment Facility is in McCracken County, KY approximately one mile east of Woodville. The facility serves a 20-home subdivision within a 50-acre service area. The site is owned by Magruder Village Water Corporation and operates under KYPDES number KY-0083577.

### Existing Flow Loadings and Projections

There is no available data for wastewater flow, however, the existing facility has a design capacity of 7,500 gpd with an average daily flow of 8,600 gpd according to the KPDES permit. The subdivision is fully built out, per the owner. Based on the total number of residential connections, the average daily flow for the Magruder Village wastewater facility is estimated to be approximately 6,000-7,500 gpd on average. We believe the extended aeration package plant has adequate capacity to handle existing flows based on its dimensions but will require structural repairs, process upgrades and operational improvements to consistently meet its KPDES effluent limits.

### Permit Limitations and Historical Compliance

A review was performed of EPAs Echo compliance website which lists violations of wastewater treatment plants across the country. In the last 12 quarters, the Magruder Village Wastewater Treatment Facility has had multiple violations due to exceedances of monthly effluent limitations, including BOD, chlorine, E. coli, ammonia nitrogen, DO, and TSS.

A summary of the permitted final effluent limitations for the discharge from Magruder Village Wastewater Treatment Facility to an unnamed tributary to Bayou Creek is shown below:

- CBOD<sub>5</sub> 30/20 mg/L (Weekly Average/Monthly Average)
- TSS 45/30 mg/L (Weekly Average/Monthly Average)
- E. coli 240/130 #/100mL (7-day Geometric Mean/30-day Geometric Mean)
- Ammonia as NH<sub>3</sub>-N (May 1 Oct 31) 6.0/4.0 mg/L (Weekly Average/Monthly Average)
- Ammonia as NH<sub>3</sub>-N (Nov 1 Apr 30) 15.0/10.0 mg/L (Weekly Average/Monthly Average)
- Total Residual Chlorine 0.19/0.011 mg/L (Weekly Average/Monthly Average)

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### Wastewater Treatment Facility Existing Conditions

The existing wastewater treatment system consists of a package extended aeration activated sludge treatment facility. The facility lies in a 1,000 ft<sup>2</sup> fenced in area on the eastern border of the park.

Per the permit, discharge from the wastewater treatment plant will flow into a tributary to Bayou Creek.

The facility includes the following features:

- An influent septic tank with an unknown volume
- Approximately 12,700 Gal. of aeration volume (22'-0" x 11'-0" x 7'-0" depth steel tank)
- Approximately 1,250 Gal. of digester volume (3'-0" x 8'-0" x 7'-0" depth steel tank)
- (1) 11'-0" x 6'-0" x 7'-0" depth steel secondary clarifier tank (66 S.F.)
- Duplex 3 HP Roots 24 U-RAI Rotary Lobe Blower to supply air to the aeration basin and the clarifier airlifts, (only 1 is operational currently)
- The site is equipped with three phase power.

### Functionality of the Existing System

The functionality of the existing plant is similar to other extended aeration activated sludge systems. Sewage flows by gravity from the western end of the service area to a septic tank located next to the treatment facility for preliminary BOD and TSS removal upstream from the extended aeration process. There are mobile homes in the service area, but each is equipped with their own septic tank and is independent of the collection system associated with the treatment plant. From the septic tank, primary treated wastewater flows by gravity into the aeration basin. The aeration basin influent invert is equipped with a bar screen intended for the removal of rags, plastics, and stringy material that are not retained in the septic tank. The spacing between bars on the screen is not effective as installed and should be replaced. Considering the current expected average daily flow, the aeration basin is relatively oversized, which can cause difficulty in terms of maintaining optimal treatment conditions necessary for proper treatment, such as MLSS concentration and Food to Microorganism Ratio. In addition, the sludge age is likely higher than the ideal range for an extended aeration plant. These conditions can cause settleability issues that stem from bulking sludge, and the starvation of healthy floc forming bacteria.

HRT in the aeration basin at the average expected daily flow (7,500 gpd) is approximately 40 hours, which is higher than typical design parameters for extended aeration plants. Based on the existence of a septic tank at the upstream portion of the process that is likely removing a large portion of the organic content from the waste stream through anaerobic digestion, the plant is likely seeing much lower BOD and TSS influent concentrations than typical. Based on the size of the plant, expected BOD influent loading, and assuming the septic tank is removing approximately 50% of incoming BOD from the raw sewage waste stream, the MLSS concentration in the extended aeration plant should be maintained at approximately 1,000 mg/L. The RAS and WAS rates will need to be adjusted to reflect this.

It appears that the aeration basin is being fed air through two separate headers leading to two separate shear tubes that split the width of the tank evenly, approximately 10-15 feet apart along the length of the aeration basin. The shear tube closest to the secondary clarifier was the only operable one at the

Civil Engineering GIS Mapping

Potable Water

Wastewater Treatment

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time of the site visit. Based on the relatively shallow tank depth (only 7'-0"), the use of shear tubes is likely more efficient than a typical aeration grid layout involving fine or coarse bubble diffusers alone. However, the existing shear tubes are not distributed properly throughout the length of the tank. At least one additional tube will be necessary based on the oxygen demand for BOD, nitrification, mixing, and to implement a more acceptable layout that will allow the distribution of air throughout the entire tank. The existing shear tubes and diffusers should be replaced, and a third should be installed approximately halfway between the two existing locations to achieve adequate mixing conditions. The existence of a poor mixing environment could be resulting in anaerobic treatment in the unmixed portions of the tank, lowering the pH through souring caused by a lack of mixing within the anaerobic environment and inhibiting the plants ability to nitrify to the necessary extent.

The size of the secondary clarifier is also large relative to the design capacity of the plant, which based on the existence of some floating sludge in the clarifier, it could possibly mean denitrification is occurring in the sludge blanket. This can be caused if the solids retention time is too high and will cause problems such as high constituent concentrations in the effluent, while also harming the ability for disinfection to properly occur by increasing disinfectant demand. In the process of denitrification, the nitrate that is formed via the oxidation of ammonia is reduced to gaseous nitrogen by facultative anaerobes which thrive in anoxic conditions. Denitrification can occur in the secondary clarifier if retention time is too high, allowing nitrogen gas to form and causing sludge to rise over the clarifier weir. This issue can be minimized if dissolved oxygen concentrations are maintained in the aeration basin within a range where simultaneous nitrification and denitrification can occur in the aeration basin (0.3 - 1.5 mg/L), and if RAS rates are increased to minimize SRT. The existence of denitrification in the aeration basin would also recover some alkalinity lost in the process of nitrification.

In addition to the issues associated with biological treatment, the plant is assigned stringent limits for total residual chlorine but there are no tablet feeders or pumps installed for dosing chlorination or dechlorination tablets. Based on the difficulty of effectively achieving the assigned TRC limits, we recommend installing a peroxyacetic acid disinfection dosing system while continuing to utilize the existing chlorine contact tank.

In addition to unoptimized process parameters, many difficulties surrounding the operation of the current plant are likely due to its age. The owner and operator of the treatment facility do not know when it was constructed but believe it could have been finished in the 1960s or 1970s. Much of the system is rusted due to its old age and will need to be repaired or possibly even replaced. The grates placed over the tanks to provide maintenance access are unsafe and should not be used under any circumstances. All air headers, sludge return lines and wastewater process pipes are in poor condition and will need to be replaced, as well as the blowers and blower control panels.

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A process flow diagram for the existing process is illustrated below:



MAGRUDER VILLAGE EXISTING PFD

### Initial Triage Improvements Proposed

- A testing period should be completed to determine BOD, TKN, and TSS concentrations in the raw sewage influent, as well as the extended aeration plant influent downstream from the septic tank.
- An investigation should be performed to determine if the existing steel tank should be replaced, or if the tank can continue to be used following repair. Steel grating over the treatment components will need to be replaced if the existing tank is repaired, and a handrail will need to be installed around it for safety reasons.
- An investigation should be performed to determine total storage volume in the existing septic tank, as well as to monitor inventory of the sludge within. Solids may need to be pumped out of the septic tank pending the investigation.
- Installation of new fencing surrounding the site.
- Install a new electrical distribution panel and a manual transfer switch to allow for the use of a portable generator for use in emergency situations.
- Installation of an ultrasonic level transducer and V-Notch Weir for flow measurement in the chlorine contact tank if practical, as well as a remote monitoring system to record flow data prior to additional system improvements.
- The existing blower shed will need to be renovated.

### Initial Wastewater Treatment Facility Recommended Improvements

- Install new duplex blower system for extended aeration (including WAS/RAS & Scum Airlifts).
- Install new simplex blower system for the digester.
- New control panels with VFDs should be installed for blowers, allowing them to be throttled downwards or upwards as necessary to increase energy efficiency. This will help to reduce

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Wastewater Treatment

21 DESIGN Civil Site Design Construction Support Transportation Wastewater Collection

operational costs over time. And will allow optimization of dissolved oxygen concentration in the aeration basin to assist in achieving simultaneous nitrification and denitrification.

- Install a new bar screen upstream from the aeration basin.
- All process air, sludge, wastewater piping and valving should be replaced and upsized if necessary pending aeration calculations.
- Existing shear tubes and diffusers will need to be replaced, and an additional one installed in between.
- Install new peroxyacetic acid disinfection system to feed the existing contact tank including redundant peristaltic pumps, a dual walled container, and all other necessary appurtenances. Dosage can be paced based on a 4-20 mA signal transmitted from the level transducer.
- We recommend the addition of new density current baffle in the clarifier to inhibit the release of floating solids into the effluent.

The process flow diagram for the proposed process is shown below.



### MAGRUDER VILLAGE PROPOSED PFD

### Wastewater Collection System Understanding

The collection system consists solely of gravity sewer. The mobile homes in the subdivision are equipped with their own septic tanks that are separate from the collection system.

### Wastewater Collection System Recommended Improvements

- GIS shapefiles should be developed for future maintenance. System mapping at the fingertips of the operators will enhance the level of service and timing of responses to emergency and customer issues.
- Install flow monitoring, perform smoke testing, perform video inspection at selected locations, evaluate systems and create GIS based maintenance priority list to help understand and reduce the effect of I and I on the system.

GIS Mapping

Potable Water

Wastewater Treatment

### NARUC Capital Cost Estimate

MAGRUDER VILLAGE WWTF NARUC COST ESTIMATE SPREADSHEET

21 DESIGN

Item	NARUC Category	EXPENSES	FIXED ASSETS	TOTAL
Initial Improvements				
Install New Manual Transfer Switch with a Quick Connect and Electric Distribution Panel	Sewer - General Plant	\$0	\$25.000	\$25.000
Miscellaneous Electrical Cleanup	Sewer - General Plant	\$0	\$10,000	\$10,000
Install Mission Monitoring (Plant)	Sewer - General Plant	\$0	\$15,000	\$15,000
Replace Site Fencing	Sewer - General Plant	\$0	\$5,000	\$5,000
Blower Shed Maintenance	Sewer - General Plant	\$0	\$20,000	\$20,000
Pump out Septic Tank	Sewer - Treatment and Disposal	\$0	\$10,000	\$10,000
Level Transducer and V-Notch Weir Installation	Sewer - Treatment and Disposal	\$0	\$20,000	\$20,000
Steel Grating Installation	Sewer - Treatment and Disposal	\$0	\$20,000	\$20,000
Existing Steel Tank Repair (Option)	Sewer - Treatment and Disposal	\$0	\$75,000	\$75,000
* Replacing the steel tank would add approximately \$25,000 to the total				
Secondary Improvements				
Extended Aeration Duplex Regenerative Blower System and Control Panel with VFD	Sewer - Treatment and Disposal	\$0	\$10,000	\$10,000
Aerobic Digester Simplex Regenerative Blower and Control Panel with VFD	Sewer - Treatment and Disposal	\$0	\$10,000	\$10,000
Replace Wastewater Process Piping and Valving	Sewer - Treatment and Disposal	\$0	\$20,000	\$20,000
Replace Air Headers, Shear Tubes and Diffusers	Sewer - Treatment and Disposal	\$0	\$20,000	\$30,000
Clarifier Weir and Density Current Baffle	Sewer - Treatment and Disposal	\$0	\$12,000	\$12,000
Install Peracetic Acid Disinfection System	Sewer - Treatment and Disposal	\$0	\$25,000	\$25,000
TOTAL (INCLUDING TANK REPAIR OPTION)		\$0	\$297,000	\$297,000

Construction Support

Transportation

**Civil Site Design** 

Wastewater Collection

**GIS Mapping** 

Potable Water

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Civil Site Design Construction Support Transportation Wastewater Collection



View of Existing Wastewater Treatment Facility



Secondary Clarifier and Air Header from Blower Shed

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**Digester Tank** 



**Aeration Basin** 

GIS Mapping

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### **Secondary Clarifier with Return Lines**



GIS Mapping

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Civil Site Design Construction Support Transportation Wastewater Collection



**Blower Shed** 



**View Inside Blower Shed** 

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Civil Site Design Construction Support Transportation Wastewater Collection



**Disinfection Basin with Baffle Wall** 





**Influent Screening Basin** 

CONFIDENTIAL TO CSWR







# \*\*2018-10-23 QUAIL RUN PHASE II

PICKETT, RAY & SILVER INC. CIVIL ENGINEERING, LAND SURVEYING,	St. Peters           22 RICHMOND CENTER COURT           St. Peters, MO 63376           Phone (636) 397-1211           Fax (636) 397-1104           www.prs3.com         1-800-708-3918			
IMPROVEMENT PLANS QUAIL RUN DEVELOPMENT PHASE II	Prepared For:       161 Killdeer Circle         Quail Run Properties, LLC       Moscow Mills, Missouri 63362			
Umbed with the second secon				
W. I.S. 10/16/18 CHECKED DATE D.S. T. 10/16/18 PROJECT # 00076. QRPL. 09R TASK # X FIELD X BOOK X IMPROVEMENT PLANS QUAIL RUN DEVELOPMENT PHASE II SHEET 10 OF 17 © copyright 2018 by Pickett, Roy & Silver Inc.				

50 U GRAPHIC SCALE IN FEET

 PROFILE SCALE:

 HORZ:
 1" = 50'

 VERT:
 1" = 10'







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ORIGINAL GROUND (TYP.)	GRANULAR FILL (TYP.)	ÖRİGİNAL ĞROUND (TYP.)	PROPOSED GRADE (TYP.)	(MH) 1.7
PROPOSED GRADE (TYP.)	8" WATER CROSSING			· · · · · · · · · · · · · · · · · · ·
	GRANULAR FILL (TYP.)			570
	198.27'	Δ       Δ	2	560
<i>322.81′ 66</i> <i>8″ SAN 16</i> <i>99</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i>179</i> <i></i>	© 1.28%	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 569.09 \\ = 566.75 \\ = 56$	7:561.77 - 8'
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			FL 0U7:56	530
) 6+00 7+00 8	+00 9+00 10+	-00 11+00 12+00	13+00 14+00	520 <u>5</u> 14+88

PR SAN 1

## **SEE REVISED SHEET 10**



PR SAN 2

### PHASE II\* $\overline{\mathbf{a}}$ Ó \*\*2018-

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IMPROVEMENT PLANS QUAIL RUN DEVELOPMENT PHASE II	Prepared For:       161 Killdeer Circle         Quail Run Properties, LLC       Moscow Mills, Missouri 63362				
William Scheidt         License# - PE-20180         William Scheidt         License# - PE-20180         DRAWN         W.T.S. 7	NTICATION by for professional y on this project to the set of ed by the seal, te hereunder ibility is disclaimed ineering plans orget and es revisions after eauthenticated. AY & SILVER, INC DATE 10/16/18 DATE 10/16/18				
TASK # X FIELD BOOK X IMPROVEMENT PLANS QUAIL RUN DEVELOPMENT PHASE II SHEET 10 OF 17 © Copyright 2018 by Pickett, Ray & Silver Inc.					

50 0 GRAPHIC SCALE IN FEET

PROFILE SCALE: HORZ: 1" = 50'VERT: 1" = 10'