COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of

Electronic Application of Bluegrass Water Utility Operating Company, LLC for Certificates of Convenience and Necessity for Projects at the Woodland Acres Site	))))	Case No. 2022-00015

Bluegrass Water's Response to Staff' Second Request for Information

The Applicant, Bluegrass Water Utility Operating Company, LLC ("Bluegrass"), herewith submits its Response to the Commission Staff's Second Request for Information. A signed, notarized verification for these Responses appears on the following page. The undersigned counsel is responsible for any objection noted for a particular response.

Respectfully submitted,

/s/ Kathryn A. Eckert

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Bluegrass Water Utility Operating Company, LLC

Verification

I, **Aaron Silas**, Regulatory Case Manager of Central States Water Resources, Inc., the manager of Applicant Bluegrass Operating Company, LLC being duly sworn, state that I prepared or supervised the preparation of the following responses to PSC's Second Request for Information, and that the matters and things set forth in the responses are true and correct to the best of my knowledge, information and belief formed after reasonable inquiry.

Aaron Silas

STATE OF MISSOURI)
COUNTY OF St. Louis)

Subscribed, sworn to, and acknowledged this 18th day of April 2022, before me, a Notary Public in and before said County and State.

My Commission expires: 11/13/2022

NOTARY PUBLIC

{seal}

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

MERANDA K. KEUBLER
My Commission Expires
November 13, 2022
St. Louis County
Commission #14631487

Request

1. Refer to Application, pages 4–5. For each project described in the Application, state the expected frequency of service interruptions and period you expect plant to be out of service.

Response

Bluegrass does not anticipate any service interruptions or any period where the plant will be out of service during construction of the projects or operation of the system.

Request

2. Refer to Bluegrass Water's Response to Commission Staff's First Request for Information (Response to Staff's First Request), Item 8. For each alternative to the MBBR system identified, state the expected frequency of service interruptions for each alternative and period you would expect plant to be out of service.

Response

Bluegrass also does not anticipate any service interruptions or any period that the plant would be out of service during construction of any of the alternatives or operation of the system that includes any of the referenced alternatives.

Request

3. Refer to the Response to Staff's First Request, Item 17. For each alternative to the peracetic acid system identified, state the expected frequency of service interruptions for each alternative and period you would expect plant to be out of service.

Response

Bluegrass also does not anticipate any service interruptions or any period that the plant would be out of service during construction of any of the alternatives or operation of the system that includes any of the referenced alternatives.

Request

4. Refer to the Response to Staff's First Request, Item 23. For each alternative to the wet weather overflow prevention measures identified, state the expected frequency of service interruptions for each alternative and period you would expect plant to be out of service.

Response

Bluegrass also does not anticipate any service interruptions or any period that the plant would be out of service during construction of any of the alternatives or operation of the system that includes any of the referenced alternatives.

Request

5. Refer to the Response to Staff's First Request, Item 2, KY2022- 00015_BW_0356.
   a. Identify those items identified in KY2022-00015_BW_0356 that are part of each of the three projects for which approval is requested in this matter.
   b. Identify those items identified in KY2022-00015_BW_0356 that have been completed to date.
   c. Identify any project identified in KY2022-00015_BW_0356 that Bluegrass Water has now determined does not need to be completed, and explain why Bluegrass Water reached that determination.

Response

a. These items, all included in KY2022-00015_BW_0356, are identified in KY2022-00015_BW_0360, previously produced in response to 1 PSC 02. The following items on KY2022- 00015_BW_0356 are not part of the three projects for which approval is requested:

   - Package plant diffusers & diffuser piping replacement
   - Add/upgrade Mission monitoring system
   - Electrical wiring improvements for safety for package plant
   - Fence replacement (Minor)

   The item Wet Weather Tank Pad is inadvertently listed twice on KY2022-00015_BW_0356.

b. None of the items listed in KY2022-00015_BW_0356 have been completed to date.

c. Bluegrass has not determined that any of the items proposed no longer need to be completed.

Request

6. Refer to the Response to Staff's First Request, Item 29, KY2022- 00015_BW_0370 in which a representative from 21 Design Group, Inc. mentions the prospect of the existing steel tank failing and Response to Staff's First Request, Item 31, KY2022-00015_BW_0390-0391 discussing the need to ultimately replace steel tank.
   a. Describe the current condition of the existing steel tank, including the risk of failure.
   b. Explain how a failure would be handled both with and without the projects proposed herein, including whether the projects proposed in this matter would mitigate the risks and effects of failure. If so, explain how.
   c. Explain Bluegrass Water's current timeline for performing significant patching or replacement of the steel tank that Bluegrass Water indicated would be necessary in its corrective action plan.

Response

a. The existing steel tankage at the facility is in poor condition with some areas where holes have rusted all the way through the tank. Shortly after closing, Bluegrass performed patching of these areas to prevent leaking of wastewater into the ground.

   Despite patching, any future risk of failure would be due to continued deterioration with additional portions of the tank rusting away. This would increase the risk that wastewater would leak into the ground and potentially lead to unauthorized release of untreated wastewater into the environment. Such continued deterioration would likely trigger involvement by the Division of Water in addressing tank repair and/or replacement during the permit renewal process.

b. The response to a total tank failure would be the same regardless of whether the proposed projects are completed. Specifically, should a total tank failure occur, the facility tanks will need to be replaced. In that situation the facility would likely continue to operate with the failed tanks while replacement tanks are constructed adjacent to the existing

plant on the same site. In this instance, wastewater would be diverted into the new tanks with the existing aeration equipment being moved into the new tanks. This is how Bluegrass would proceed with or without the new equipment contemplated in the proposed projects. The projects proposed will not mitigate or accelerate the failure of the tanks as discussed above.

c. Some minimal patching was completed immediately after Bluegrass closed on the facility to prevent leaking of wastewater into the ground. As Bluegrass continues to operate the facility, repairs will be completed on an as needed basis to prevent leaking until such time as the tanks are determined to require replacement. Replacement is being delayed as long as possible to reduce rate impact to customers. There is no specific timeline for more significant patching or for tank replacement. Rather, Bluegrass will continue to monitor the situation and assess as events transpire.

Request

7. Refer to the Response to Staff's First Request, Item 2, KY2022- 00015_BW_0356 and Response to Staff's First Request, Item 31, KY2022- 00015_BW_0390-0391.
   a. State whether all projects identified in phase 1 and 2 of the corrective action plan are listed as items in the breakdown on KY2022-00015_BW_0356.
   b. Provide the estimated cost of any project proposed in the corrective action plan that is not listed in the breakdown on KY2022-00015_BW_0356.
   c. State whether Bluegrass Water anticipates any projects for the Woodland Acres system in the next five years that are not listed in the breakdown on KY2022-00015_BW_0356 or proposed in the corrective action plan. If so, identify and describe the projects and provide the estimated cost of the projects.
   d. Provide the expected useful life of the Woodland Acres Wastewater Treatment Plant, or its major components, when phase 1 and 2 of the corrective action plan are completed.
   e. Explain whether each of the projects proposed in this matter will continue to be used and useful when Bluegrass Water completes phase 1 and 2 of the corrective action plan.

Response

a. All Phase 1 projects of the Corrective Action Plan (KY2022- 00015_BW_0390-0391) are included in the breakdown on KY2022-00015_BW_0356. The potential Phase 2 projects would be in the future to replace portions of the plant as these reach end of useful life, and are not listed in the breakdown. The projects proposed in this CPCN application are Phase 1 projects, consistent with the work proposed in the construction permit application submitted to DOW. The DOW application has been attached hereto as KY2022-00015_BW_0432-0445.

b. Because Phase 2 of the Corrective Action Plan (KY2022-00015_BW_0390-0391) is a possible future project, no estimates for proposed Phase 2 projects have been developed,

and therefore are not included in KY2022-00015_BW_0356. Only those estimates related to Phase 1 projects are included in KY2022-00015_BW_0356.

c. At this time, no additional large capital projects are planned in the next 5 years. The potential for continued deterioration of the tank may give rise to the need for significant investment in tank replacement. If possible, it is Bluegrass's intention to delay tank replacement for the next 5 years by performing repair work.

d. Bluegrass estimates that the tanks likely have 5 to 10 years of useful life left as Bluegrass continues to complete tank repairs on an as needed basis. While much of the equipment being procured for these proposed projects will outlive the actual plant tankage, the equipment will be incorporated into new tanks when the useful life of the tanks has reached its end (as all of the proposed project equipment has a likely 15-25 year lifespan). With this strategy, the plant will not reach a true end of its useful life because components will be repaired or replaced to extend the useful life of the facility as long as it is needed to treat this community's wastewater.

e. All of the equipment contemplated in this project will be included in the permanent treatment processes for this facility and remain in use and useful as long as the plant remains in operation. None of this is temporary equipment or equipment that Bluegrass plans on removing from the facility.

FORM W-1

Commonwealth of Kentucky
Energy and Environment Cabinet
Division of Water

CONSTRUCTION PERMIT APPLICATION for WASTEWATER TREATMENT PLANT

See the INSTRUCTIONS for more information about selected portions of this application.
Questions on completing this application? Contact the Water Infrastructure Branch at 502/564-3410 or visit our website at http://water.ky.gov for more information.

I. CONSTRUCTION PROJECT INFORMATION

Project Name: Woodland Acres WWTP System Upgrades

Project City/County: Shepardsville, Bullitt County, Kentucky

Name of WWTP: Woodland Acres Subdivision WWTP

KPDES Number of WWTP, if known (for modifications to an existing plant): **KY** 0091600

Estimated cost of WWTP improvements and sewer line extension: $ 331,000

Project is: ☐ **WWTP Only** ☐ **WWTP with sewer lines**

☒ **Minor Modification to WWTP (Complete only Sections I, II, IV A, B, C, E3, H1, VII, VIII)**

II. APPLICANT INFORMATION

Applicant (Entity paying for construction): Bluegrass Water Utility Operating Company LLC E-mail: jfreeman@cswrgroup.com

Street Address: 1650 Des Peres Road, Suite 303

City, State, Zip: St. Louis, MO 63131

Will ownership be transferred? ☐ Yes. Name of new owner: _____ ☒ No

III. PRELIMINARY SUBMITTAL

Has a Preliminary Submittal been made with all the information in this section? [See 401 KAR 5:005, Section 3]

☐ Yes. Name of project: _____

County and Location of project, then skip to next section: _____

☒ No. Provide the information below that has not been previously submitted (use additional pages, as necessary). Place a **check** (✓) by the items included in the application or an **N/A** if the item is not applicable to the project.

N/A A. A copy of a 7½ minute USGS topographic map, with the WWTP, any proposed sewer lines, service area, and discharge location identified.

N/A B. For a WWTP located within a planning area, a letter from the regional or facility planning agency stating the proposed WWTP is compatible with the regional facility plan or the water quality management plan.

N/A C. For a WWTP located within a planning area, a demonstration that a connection to the regional facility is not available.

N/A D. For a regional WWTP, a water quality management plan that is in compliance with **401 KAR 5:006**.

IV. DESIGN CONSIDERATIONS

A. PLANS AND SPECIFICATIONS.

Design plans and specifications shall comply with 401 KAR 5:005 and "Recommended Standards for Wastewater Facilities" ("Ten States' Standards") 2014 edition. If engineering practices, other than those contained in "Ten States' Standards", were used in the design, indicate the source and the corresponding portion of the design. **[See 401 KAR 5:005, Section 7]**

Plans and specifications submittals shall meet on of the following options:

☐ Submit at least one paper printed set of detailed plans (no larger than 24" x 36") and a PDF copy of the plans and specifications on a data storage device such as a USB flash drive. Both copies shall be dated with a stamp, signature of a licensed professional engineer in Kentucky which complies with the requirements of 201 KAR 18:104. The digital plans shall consist of a single pdf file and be in a folder called "Engineering Plans" and the specifications manual shall be in a folder called "Specifications".

4 Submit a PDF copy of the plans and specifications digitally via the electronic form on the KY One Stop Business Portal website. The PDF copy shall be dated with stamp and signature of a licensed engineer in Kentucky which complies with the requirements of 201 KAR 18:104 Section 3. The plans shall be submitted as a single pdf file.

B. DESIGN ENGINEER, if the WWTP design capacity is greater than 10,000 gpd or if the sewer lines associated with the WWTP will become part of a sewer system served by a regional facility. **[Section 6]**

P.E.'s Name: Benjamin Kuenzel Firm: 21 Design Group

Street Address: 1351 Jefferson Street Suite 301

City, State, Zip: Washington, MO 63090

Phone: 636-432-5029 Fax: N/A E-mail: ben@21designgroup.net

C. CONFORMITY TO PLANS AND SPECIFICATIONS. Provide name of person who will inspect and certify that the constructed facility conforms to the approved plans and specifications. If the WWTP's design capacity is greater than 10,000 gpd, or if the sewer lines will become part of a sewer system served by a regional facility, this person must be a professional engineer (P.E.). **[Section 3]**

Name: Benjamin Kuenzel Firm: 21 Design Group

Street Address: 1351 Jefferson Street Suite 301

City, State, Zip: Washington, MO 63090

Phone: 636-432-5029 Fax: N/A E-mail: ben@21designgroup.net

D. DESIGN CAPACITIES. Provide the following design capacities, in million gallons per day or pounds per day. **[Section 3]**

Average Daily Flow: _____ MGD Influent BOD: _____ lb/day

Peak Daily Flow: _____ MGD Influent SS: _____ lb/day

Peak Hourly Flow: _____ MGD Influent NH_3-N: _____ lb/day

E. Design Criteria. Provide the following information (use additional pages, as necessary). Place a **check (✓)** by the items included in the application or an **N/A** if the item is not applicable to the project.

N/A 1. A schematic drawing of the facility layout and explanation of the proposed facility and method of operation. **[Section 3]**

N/A 2. WWTP's Reliability Category, Grade A, B, or C: _____. Include a detailed description of the reliability measures that will be used for the WWTP. **[Sections 3 and 13]**

✓ 3. A discussion of the design criteria used to size the unit processes. **[Section 3]**

F. LABORATORY SERVICES. Give name of laboratory that will provide services for self-monitoring and process control. **[Section 3]**

Firm Name: _____

Street Address: _____

City, State, Zip: _____

G. SITE LOCATION. Place a **check (✓)** by the items that are included in this application or an **N/A** if the item is not applicable to the project.

N/A 1. Include a plat or survey clearly indicating the site's boundaries, position of proposed facility in reference to the boundaries, and position of dwellings within 200 feet of the WWTP. **[Section 3]**

N/A 2. If an open-top WWTP is closer than 200 feet to the closest dwelling, include what structure or other measures will be used for noise and odor control. **[Section 4]**

N/A 3. For a WWTP with a spray irrigation system, if the distance from the spray field to the property boundary is less than 20 feet, include what protective measures will be used to inhibit spray from crossing property boundary. **[Section 21]**

H. OTHER INFORMATION TO BE SUBMITTED WITH APPLICATION. Place a **check (✓)** by the items that are included in this application or an **N/A** if the item is not applicable to the project.

✓ 1. If modifying or replacing an existing WWTP or sewer line, a closure plan indicating how the new facility will be constructed without a by-pass to a stream and the procedures that will be used for abandoning the existing facility. **[Section 3]**

N/A 2. A Sludge Management Plan for WWTPs, including the sludge processing method and how sludge will be ultimately disposed. **[Section 3]**

N/A 3. If the discharge point does not coincide with a blue line on a USGS map, a copy of a recorded deed, recorded other right of ownership, or recorded right of easement for a corridor to the nearest blue line stream. **[Section 3]**

N/A 4. A description of and detailed specifications for the flow measuring device. **[Section 7]**

N/A 5. If the WWTP discharges to a sinkhole or sinking stream, a plan for a groundwater tracer study (or a previously conducted groundwater tracer study). **[Section 4]**

V. SEWER LINES

Include the following items for projects that include sewer lines. If project is for only a WWTP, skip to next section. Place a **check (✓)** by the items that are included in this application or **N/A** if the item is not applicable to the project.

N/A A. If the project includes a pump station, the pump performance curve. **[Section 8]**

N/A B. If the project includes gravity sewer lines or force mains, a plan view and profile view for each. **[Section 6]**

N/A C. A demonstration that the sewer system has adequate capacity to treat the current and the anticipated flow to the WWTP and that the sewer system is not subject to excessive infiltration or excessive inflow. **[Section 8]**

N/A D. A demonstration that the WWTP has adequate capacity to transport the anticipated flow to the WWTP and the WWTP is not subject to excessive infiltration or excessive inflow. **[Section 8]**

VI. OTHER REQUIRED APPLICATIONS

___ A. If the WWTP has a discharge, complete and file with this application: KPDES Application (KPDES Form 1); and Form A, B, C, or Short Form C, as applicable.

___ B. If the WWTP does not have a discharge, complete and file with this application the "No Discharge Operating Permit Application, Form ND."

VII. FEES

Fees. Check or money order must be made payable to "**Kentucky State Treasurer**" for the total amount. **Fees do not apply** for a municipality, sanitation district, or other publicly owned facility. **[Section 5]**

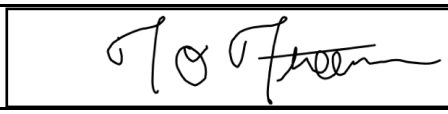
WWTP Category: Minor Modification to a WWTP — Amount: $ 200

Sewer Line Category: N/A — Amount: $ 0

Total Amount: $ 200

VIII. CERTIFICATION

I, the applicant, certify under penalty of law that this document and all attachments were prepared under my direction or supervision. 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 or imprisonment or both for known violations. **[Section 2]**

Applicant's Name and Official Title (Type or Print)		**Phone Number (Include area code)**
Jacob Freeman		(314)-550-1167
Signature		**Date** 2/11/22

Woodland Acres Wastewater Facility Improvements - KY0091600
Design Considerations – Construction Permit Application
Date: February 14, 2022

Introduction

The purpose of this document is to specifically address the criteria used for the design of various improvements to the Woodland Acres Wastewater Treatment Facility, and to describe pertinent information required in Section IV - "Design Considerations" of the Construction Permit Application for said improvements.

Design Criteria

The process flow diagram for the proposed improvements is included in Section A of the appendix to this specific document.

Raw sewage will continue to enter the facility directly from the gravity collection system to the existing wet weather surge basin. A new 4,100 gallon wet weather tank will be added to the process to increase the amount of wet weather storage to approximately 10,000 gallons, providing additional relief for the processes downstream. Three new Zoeller 841 influent grinder pumps will be added to the existing surge tank. Two of the new pumps will be used with duplex control panel to feed the treatment plant, while the third pump will be added and used with a simplex control panel to feed the new wet weather tank when the water level in the surge tank rises to its high water level. The new wet weather tank will be equipped with an overflow directed into the aeration tanks. The system will be able to meet the pumping requirements with any pump pump out of service.

To supplement the existing extended aeration plant, an IFAS cage (detailed on sheet P3) will be placed in the existing tank to remove approximately 70% of the influent BOD. Two additional blowers will be added to the process to provide enough oxygen for the IFAS addition, additional post-aeration, and the existing processes.

The two existing blowers will continue to be utilized. One existing blower will become a redundant standby blower (that can be used to supply air to either extended aeration, the IFAS cage, and post-aeration tank or just to the aerobic digester). The other existing blower will be dedicated for providing aeration to the aerobic digester.

Four 3/8" flex cap diffusers will be added to the existing contact tank to assist the plant in meeting its 7.0 mg/L effluent Dissolved Oxygen minimum concentration.

Based on the level of redundancy in the design, we believe the plant qualifies for classification as Grade A Reliability. A transfer switch will be installed that allows the use of a backup generator which will provide sufficient power for the entire facility including the blowers, allowing continuous use of all

treatment processes. The aerobic digester blowers will have redundancy made available with the use of the existing extended aeration blower as a standby.

A summary of the design criteria used for unit process sizing is included in Section B of the Appendix including IFAS and Aerobic Digestion Calculations. Each process was designed in accordance with the 2014 version of Ten State Standards for Wastewater Facilities and 401 KAR 5:005.

Site Location

A site plan can be found in the plan documents which clearly shows the site boundaries and the position of the site in reference to those boundaries.

The facility is designed as an open-air plant, so multiple techniques will be used to minimize the negative impact of the plant improvements towards the local population including odor and noise. The aerobic digester will continuously be aerated to maintain aerobic conditions, significantly reducing the potential for odor generation.

Appendix

Section A - Process Flow Diagram

Section B - Summary of Design Criteria

Section A – Process Flow Diagram

DESIGN CRITERIA:

PLANT INFLUENT FLOW

Q_{ADF}= 25,000 GPD BOD= 225 MG/L
Q_{PDF}= 75,000 GPD TSS= 225 MG/L
Q_{PHF}= 100,000 GPD TKN= 40 MG/L

EFFLUENT PARAMETERS

BOD: 10 MG/L
TSS: 30 MG/L
NH3–N: 4 MG/L IN SUMMER
10 MG/L IN WINTER
E–COLI–130 MPN/100 ML
TOTAL RESIDUAL CHLORINE: 0.011 MG/L
MIN. DO: 7.0 MG/L MIN.

IFAS (CAGES)

NO. OF IFAS CAGES: 1
DIMENSIONS: 4'x6'x10' (SWD)
TOTAL CAGE VOLUME = 1,795 GALLONS
INF. BOD = 225 MG/L, 47 LBS/D
EFF. BOD TARGET = 68 MG/L, 14 LBS/DAY
HRT @ ADF = 1.7 HRS
MEDIA SURFACE RQD. = 937 M^2
MEDIA VOLUME RQD. (W/650 M^2/M^3 MEDIA) = 51 CF
MEDIA VOLUME PROPOSED: 72 CF
MEDIA FILL % = 30 %
SCFM RQD. = 46 SCFM

CONTACT TANKS / POST–AERATION

VOLUME: 4,525 GAL
HRT @ PHF: 65 MINUTES
THE TANK WILL HAVE FOUR FLEXCAP DIFFUSERS USED FOR POST–AERATION TO MEET DO EFFLUENT MIN. OF 7 mg/L
AIR FLOW RATE: 20 SCFM/1,000 CF
SCFM PROVIDED: 12 SCFM

WET–WEATHER STORAGE

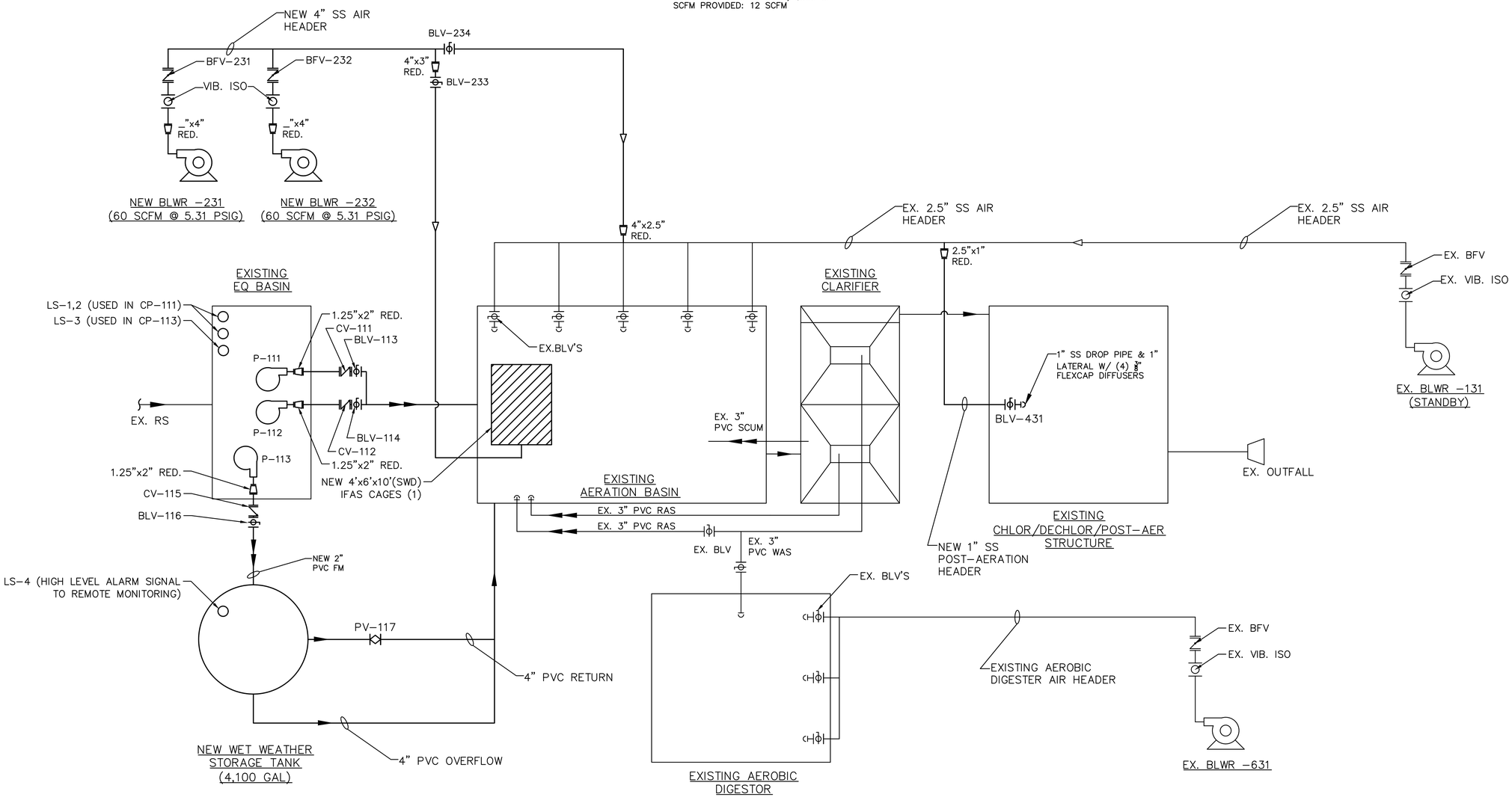
NEW TANK VOLUME: 4,100 GAL
NEW TANK HRT @ ADF: 3.94 HR
TOTAL WET WEATHER VOLUME AT PLANT (INCLUDING EXISTING WET WEATHER TANK): 10,832 GAL
TOTAL WET WEATHER STORAGE RETENTION TIME AT ADF: 10.4 HR

WET WEATHER/INFLUENT PUMPS

P–111,112,113:
MODEL: ZOELLER 841 GRINDER PUMP
TDH: 30'
GPM: 55 GPM

NEW BLOWERS

BLWR 231, 232,
FUNCTION: EXTENDED AERATION, IFAS CAGES, RAS/WAS AIRLIFTS, POST–AERATION
TOTAL SCFM RQD.: 118 SCFM
SCFM/BLOWER: 59 SCFM
DISCHARGE PRESSURE: 5.35 PSIG
NO. OF BLOWERS: 1 EX. DEDICATED BLOWER, 2 NEW BLOWERS



#	DATE	REVISION	BY
A	2/11/2022	PERMIT SET	B.K.

21 DESIGN GROUP INC.
1351 Jefferson, Suite 301
Washington, MO 63090
mail@21designgroup.net
P: 636-432-3029

PROCESS FLOW DIAGRAM

WOODLAND ACRES WWTF IMPROVEMENTS
HEMLOCK DRIVE
BULLITT, KENTUCKY

ENGINEERING CERTIFICATE OF AUTHORITY NO. 4804
ENGINEERING LICENSE: BENJAMIN J. KUENZEL, PE33718

SEAL DATE:	2/11/2022
DRAWN BY:	KAR
PROJ NUMBER:	0613-19
DATE:	2/11/2022
DRAWING NO:	P1

Section B – Summary of Design Criteria

MBBR Design Criteria
Woodland Acres
February 9, 2022

	Plant Influent Characteristics		
1	Annual Average Daily Flow	25,000	gpd
2	Maximum Monthly Average Daily Flow	25,000	gpd
3	Peak Daily Flow	75,000	gpd
4	Peak Hourly Flow (w/out Equalization)	100,000	gpd
5	Influent BOD	225	mg/L
6	Influent BOD	46.9	lbs/day
7	Influent TSS	225	mg/L
8	Influent TSS	46.9	lbs/day
9	Influent NH3-N	35	mg/L
10	Influent NH3-N	7.3	lbs/day
11	Influent TKN	40	mg/L
12	Influent TKN	8.3	lbs/day
13	Influent pH	7	
14	Water Temperature	12	deg-C
	Roughing MBBR Influent Characteristics		
15	Annual Average Daily Flow	25,000	gpd
16	Maximum Monthly Average Daily Flow	25,000	gpd
17	Peak Daily Flow (w/Equalization)	75,000	gpd
18	Peak Hourly Flow (w/Equalization)	100,000	gpd
19	Influent BOD	225	mg/L
20	Influent BOD	46.9	lbs/day
21	Influent TSS	225	mg/L
22	Influent NH3-N	35	mg/L
23	Influent TKN	40	mg/L
24	Design Influent TKN	40	mg/L
25	Influent pH	7	
26	MBBR Effluent Water Temperature	10	deg-C
	Roughing MBBR Sizing Summary		
27	No. of Tanks Cages Proposed	3	
28	Length of Each	5.5	ft
29	Width of Each	3.5	ft
30	Side Water Depth of Each	10.0	ft
31	Tank Height of Each	12.0	ft
32	Volume of Each	1,440	gallons
33	Volume Total	4,320	gallons
34	Hydraulic Retention Time at Annual Average Flow	4.15	hours
35	Hydraulic Retention Time at Maximum Monthly Average Flow	4.15	hours
36	Hydraulic Retention Time at Peak Hourly Flow	1.04	hours
37	Total Media Surface Area Requirement	937	m^2
38	Total Media Surface Area Proposed	3,189	m^2

	MBBR Aeration	**Stage 1**	
39	Target BOD Effluent (70% Removal)	68	mg/L
40	AOR (lbs/day)	49	lbs/day
41	Assumed Diffuser Subm. at AWL (ft.)	9.25	ft
42	Elevation (ft.)	442	ft
43	Alpha	0.70	
44	Beta	0.9	
45	Target DO Residual (MBBR Process) (mg/L)	3.0	mg/L
46	SOR (lbs/day)	118	lbs/day
47	Target Diffuser Efficiency/ft. Submergence	1.1	%
48	**Airflow Required for MBBR Aeration (scfm)**	**46**	**scfm**
49	Airflow per 1,000 scfm	79	scfm/1,000 cf
50	No. of Blowers	2	(Shared)
51	Type of Blower	PD	
52	Discharge Pressure	5.31	psig
	Extended Aeration		
53	Target BOD Effluent	5	mg/L
54	Target NH3-N Effluent	3	mg/L
55	AOR (lbs/day)	43	lbs/day
56	Assumed Diffuser Subm. at AWL (ft.)	9.25	ft
57	Elevation (ft.)	442	ft
58	Alpha	0.70	
59	Beta	0.9	
60	Target DO Residual (Ex. Aeration Process) (mg/L)	2.00	mg/L
61	SOR (lbs/day)	87	lbs/day
62	Target Diffuser Efficiency/ft. Submergence	1.10	%
63	**Airflow Required for Extended Aeration (scfm)**	**41**	**scfm**
64	No. of Blowers	2	(Shared)
65	Type of Blower	PD	
66	Discharge Pressure	5.31	psig

	Blower Requirement Summary		
67	NEW BLWR'S-231, 232		
68	**Airflow Required for MBBR Aeration (scfm)**	**46**	scfm
69	**Airflow Required for Extended Aeration (scfm)**	**41**	scfm
70	**Airflow Required for RAS/WAS Airlifts (scfm)**	**20**	scfm
71	**Airflow Required for Post-Aeration (scfm)**	**12**	scfm
72	**Total SCFM Required**	**118**	scfm
73	Assumed Overall Efficiency	0.62	
74	Estimated BHP Required (Total):	4.3	bhp
75	NPHP (Total)	5	bhp
76	No. Blowers	2	
77	Type of Blower	PD	
78	Discharge Pressure	5.31	psig
	Existing Tank Sizing Summary		
79	Extended Aeration Zone		
80	Tank Length	30.0	ft
81	Tank Width	9.0	ft
82	Side Water Depth	10.0	ft
83	Zone Volume	20,196	gal
84	HRT at Average Daily Flow	19.39	hr
85	HRT at Peak Hourly Flow	4.85	hr
86	Wet Weather Storage Basin		
87	Tank Length	10.0	ft
88	Tank Width	9.0	ft
89	Side Water Depth	10.0	ft
90	Zone Volume	6,732	gal
91	HRT at Average Daily Flow	6.46	hr
92	HRT at Peak Hourly Flow	1.62	hr
93	Existing Post-Aeration/Contact Tank		
94	No. of Contact Tanks	1	
95	Contact Tank Length	11	ft
96	Contact Tank Width	11	ft
97	Contact Tank Depth	5	ft
98	Contact Tank Volume	4,525	gallons
99	Contact Tank Hydraulic Retention Time at PHF	65	minutes
100	Airflow Required for CCT	20	scfm/1,000 cf
101	Total SCFM Required	12	scfm

	New Wet Weather Storage Basin		
102	Tank Diameter	9.92	ft
103	Tank Depth	7.17	ft
104	Volume of New Tank	4,100	gallons
105	Hydraulic Retention Time of New Tank at ADF	3.94	hr
106	Total Equalization Volume	10,832	gallons
107	Total Wet Weather Storage Retention Time at PHF	10.40	hr
	Effluent Parameters		
108	Effluent SBOD (Design Target)	5	mg/L
109	Effluent SBOD (Design Target)	1.0	lbs/day
110	Effluent NH3-N	3.0	mg/L
111	Effluent NH3-N	0.6	lbs/day
112	Effluent TSS	30	mg/L
113	Effluent TSS	6.3	lbs/day
114	E. Coli	130/240	mpn/100 mL

Request

8. Refer to the Response to Staff's First Request, Item 27.
   a. Provide any correspondence between the city of Shepherdsville and Bluegrass Water about connecting to the city's system.
   b. Describe any oral communications Bluegrass Water had with the city of Shepherdsville about connecting to the city's system.
   c. Identify the length of additional main that would be needed to connect to the city's system.
   d. Provide the expected useful life of the additional main and lift station that would be needed to connect to the city's system.
   e. Provide an estimate of the expected cost of the lift station and the expected cost of the additional main that would be needed to connect to the city's system.
   f. Explain each basis for Bluegrass Water's statement that "the ongoing cost of city waste treatment and maintaining conveyance systems to move wastewater to the city would be greater than the costs of operating Bluegrass's own facility."
   g. Provide and explain the estimated cost of city waste treatment.
   h. Provide and explain the estimated incremental increase in the cost of maintaining the conveyance system, if any, that would arise from the addition of the lift station and main that would be needed to connect to the city's system.
   i. Provide the operator cost for Woodland Acres system, and explain whether and the extent to which the operator cost for Woodland Acres system would be reduced or eliminated if it were connected to the city's systems.

Response

a. Please see the email correspondence attached hereto as KY2022-00015_BW_0423-0431.

b. Telephone conversations discussed information in the emails from Arthur C. Jones with the City of Shepherdsville ("City") and primarily focused on the potential cost of the project. Mr. Jones stated that the original estimate was about $3,000,000 and that, in his opinion, in the time since the original estimate was completed, construction costs had likely doubled to approximately $6,000,000.

c. The exact length of main required to connect to the City system cannot be determined until easements to make the connection are negotiated.

d. The expected useful life for sewer main collection lines if 50 years. The expected useful life for the lift stations is 30 years, with the electrical pumping components having a 10-year useful life.

e. Estimates of expected costs would depend on which connection option to the City is selected. These options arose from conversations with City staff, and would differ based on the length of main at issue. In the first option, to connect to the Shepherdsville system, wastewater from the Woodland Acres system could be pumped to the Blue Lick Elementary School lift station. The minimum expected length of required main to connect to this left station would be approximately 8.1 miles. This would also necessitate a minimum of 4 lift stations to convey the wastewater to the Blue Lick Elementary School lift station. Further, the Blue Lick Elementary School lift station would also need to be upgraded as the lines leading to the station cannot support the flow from Woodland Acres without overflowing. The expected cost of this option is approximately $3,645,000.

The second option, while involving a shorter length of main, would also be cost prohibitive. Under this option, Bluegrass would connect to a City gravity trunk line at a closer point and then less main would be required. However, since the City gravity trunk line could not handle Bluegrass volumes, Bluegrass would be expected to pay the City to replace the gravity trunk line. In addition, Bluegrass would be expected to remove 3 existing lift stations from service which would lead to lower operations and maintenance costs for the City (but not Bluegrass and its customers) in the long run. The City has stated that this

project would cost between $3 and $6 million (likely on the high end of this spectrum) for which Bluegrass would be responsible. Given the cost-prohibitive nature of this option, Bluegrass did not quantify an exact length of additional main that would be needed to connect to the City system at a closer point.

As a result, the better option for Bluegrass to pursue would be the connection to the Blue Lick Elementary School lift station, at a cost of $3.6 million. As discussed above, this would require the installation of at least 4 lift stations to convey wastewater to the City lift station at the Blue Lick Elementary School, with each lift station costing approximately $200,000 (total cost of $800,000 for the lift stations). In addition, the school lift station would also require improvements which were estimated to cost approximately $345,000 by the City (though this cost will likely be higher due to COVID impacts which have occurred since). Further, the new force main would likely cost approximately $60 per foot for a 4" force main for a total of about $2,500,000 (this cost includes the estimated cost for negotiating easements). In total for the improvements at the City lift station, the total estimated capital cost is approximately $3,645,000.

f. Bluegrass's statement that "the ongoing cost of City waste treatment and maintaining conveyance systems to move wastewater to the city would be greater than the costs of operating Bluegrass's own facility" are due to the fact that in addition to the investment costs and wastewater treatment costs, the City connection would likely lead to increased operations cost. With numerous newly-built lift stations to convey wastewater to the City lift station, each would still require daily site visits by operations staff and there is a possibility that negotiations with contract operations firms would seek additional contract

expense due to increased workload. Additionally, the electrical cost to operate the new lift stations would likely be comparable to the electrical cost to operate the existing treatment plant. Finally, the cost to purchase treatment from the city would represent a new additional expense. These would all result in higher operational costs for the system.

g. Per the City of Shepherdsville city code § 52.164 RATES AND CHARGES, Bluegrass's Woodland Acres system would be classified as RES-2 and pay $6.59 per 1,000 gallons of wastewater. With an anticipated flow of 30,000-45,000 gallons per day this would result in a monthly treatment expense of $5,931.00-$8,896.50. Again, this would be in addition to the cost of operating the collection and conveyance system by Bluegrass contract operators.

h. As discussed previously, this option would result in approximately $3.6 million of additional investment associated with the addition of 4 lift stations and approximately 8.1 miles of force main. The annual maintenance costs associated with these new assets based on investment required to offset depreciation would be approximately: (1) $50,000 per year for the maintenance of the force main (assuming 50 year useful life) and (2) $30,000 per year for the 4 new lift stations (assuming 25 year effective useful life based on averaging out longer wet well useful life and shorter equipment useful life). In total this would mean an annual maintenance investment of about $80,000.

i. The current contract operations cost for the Woodland Acres system is $4,200 per month. Because operators are required to visit the site daily, the additional lift stations may lead to an increase in contract operations cost due to the need to operate and inspect 4 new lift stations (4 different locations) along 8.1 miles of new force main.

Holly Lewis

From: Jake Freeman
Sent: Wednesday, April 6, 2022 5:13 PM
To: Jonathan Meany
Subject: FW: Possible Connection to City
Attachments: image001.jpg; Shep PS elimination Study.pdf; ShepherdsvilleSewer.zip

Jacob O. Freeman, PE
Director, Engineering

Central States Water Resources
1630 Des Peres Rd., Suite 140
Des Peres, MO 63131
Direct: (314) 380-8598
Cell: (314) 550-1167
centralstateswaterresources.com

From: Benjamin Kuenzel <ben@21designgroup.net>
Sent: Thursday, May 20, 2021 4:41 PM
To: Jake Freeman <jfreeman@cswrgroup.com>
Subject: Fwd: Possible Connection to City

Benjamin Kuenzel, PE, Principal
21 DESIGN GROUP
1351 Jefferson Street, Suite 301
Washington, MO 63090
Office: 636-283-5064
Mobile: 636-432-2144
Website: http://21designgroup.com/

---------- Forwarded message ---------
From: **Arthur Jones** <ajones@shepcity.com>
Date: Thu, May 20, 2021 at 4:30 PM
Subject: RE: Possible Connection to City
To: Benjamin Kuenzel <ben@21designgroup.net>
Cc: Scott Fleming <SFleming@shepcity.com>

Ben,

Thank you for our phone conversation last night. Please find attached a portion of our Sanitary Sewer System. Also attached is a preliminary assessment of a solution that could take this treatment plant offline and bring it into our service. It is anticipated that if we are going to take this into our system we would use that opportunity to create a gravity trunk line that would take out at least 3, 4 or 5 pump stations to reduce lifecycle costs. A potential route of 7,500 linear feet of gravity trunk line could feed a regional pump station. Of course initial estimates of this project was $3million before this latest doubling of construction costs so a new estimate would be needed to assess current construction costs.

Thanks,

Arthur C. Jones, P.E.

City Engineer

City of Shepherdsville

634 Conestoga Parkway

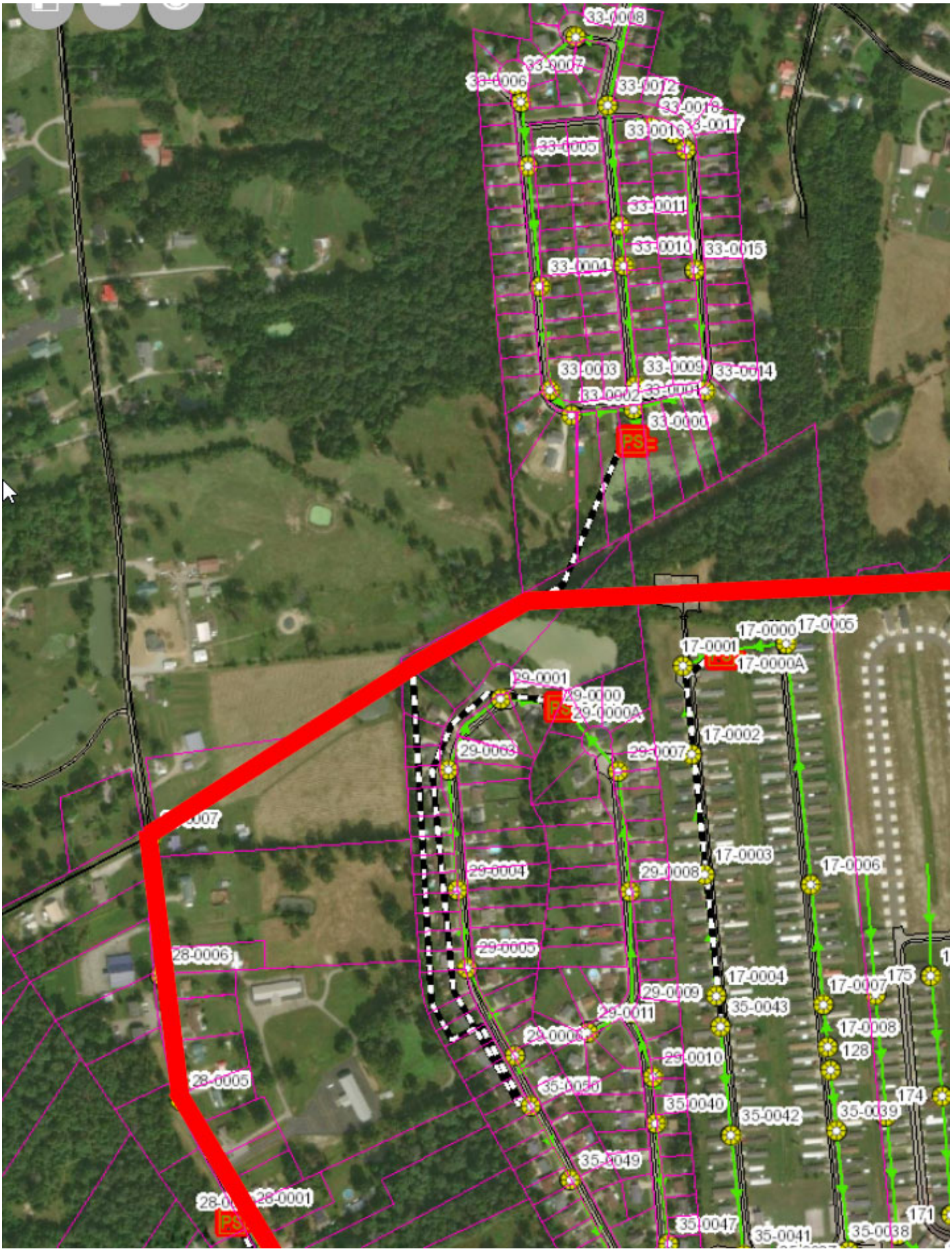
P.O. Box 400

Shepherdsville, KY 40165

City Hall: 502-543-2923

Mobile: 502-492-7404

ajones@shepcity.com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17-0008
128
29-0010
28-0005
35-0040
35-0042
35-0039
174
35-0049
28-0001
35-0047
35-0041
35-0038
171

From: Benjamin Kuenzel [mailto:ben@21designgroup.net]
Sent: Thursday, May 20, 2021 3:35 PM
To: Arthur Jones <ajones@shepcity.com>
Subject: Possible Connection to City

Arthur,

Just following up on the discussion on the GIS mapping and report for the possible connection of the sewer system near Chillicoop Road.

Thanks again,

Benjamin Kuenzel, PE, Principal

21 DESIGN GROUP

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Mobile: **636-432-2144**

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SHEPHERDSVILLE PUMP STATION UPGRADE AND ELIMINATION STUDY

FINAL REPORT

SUBMITTED TO:

THE CITY OF SHEPHERDSVILLE

SUBMITTED BY: JACOBI, TOOMBS & LANZ, INC.

JULY 2020

Jacobi,Toombs&Lanz

TABLE OF CONTENTS

Introduction

Because of recent and anticipated future growth, the City of Shepherdsville (City) is pro-actively evaluating the capacity and condition of their sanitary sewer collection system. The City's evaluation indicates that both the Transmission Shop and Blue Lick School Pump Stations and Force Main systems do not have the capacity to convey peak wet weather flows. To accommodate this condition, the City has requested that JTL perform an engineering study to determine the best option for upgrading the Transmission Shop and Blue Lick School Pump Stations and Force Main systems.

In addition, to reduce operation and system maintenance costs, the City has directed JTL to look at the feasibility of removing up to five pump stations from the Northwest service area. These pump stations include the Pointe Pump Station, Shepherds Glen Pump Station, Hickory Acres Pump Station, River Oaks Pump Station and Raymond Road Pump Station. JTL will look at replacing the five pump stations and associated force mains with a gravity line and/or a combination of gravity line and pump station conveyance system. Changes to these five pump stations will directly impact the level of influent being received by both the Blue Lick School and Transmission Shop Pump Stations.

Inspection and Data Collection

JTL's first undertaking was to gather and evaluate data on the existing collection system. Data collected included plans and shape files for areas not previously included in the City's sanitary sewer collection system model. These areas included, Autumn Leaf, Mallard Crossing, and the Enclaves at Mallard Crossing. JTL also collected data for areas such as Blue Lick Apartments, which had been modified since the City's sewer model was developed in 2018.

JTL performed surveying and field inspections to supplement and fill in the gaps found in previously collected data, particularly in Mallard Crossing, the Enclaves, Raymond Road and Woodland Acres. Surveying and inspection tasks included, obtaining manhole and wet well rim elevations and measuring manhole and wet well depths and line diameters on the existing system. Limited topographic surveying was performed as needed to update the existing sewer model, which mainly consisted of determining road and creek flow line elevations along proposed sewer routes.

Modeling and Alternative Analysis

JTL updated the City's existing conditions hydraulic model with the plan, inspection and surveying data described above. The updated model was the primary tool used for analyzing and evaluating alternative improvement options. Updates to the existing conditions model included accounting for additional flow from Woodland Acres. Aerial imaging indicates approximately 100 residences in Woodland Acres. Based on the number of existing residences, JTL estimates that Woodland Acres produces an average daily flow of 30,000 gallons per day (GPD) and a peak wet weather flow of 45,000 GPD. Additional updates to the existing condition model included eliminating the Blue Lick Apartments Pump Station, adding Mallard Crossing, the Enclaves, and Autumn Leaf collection systems to the model. After updating the existing conditions model, JTL

modeled proposed alternatives for the system modifications discussed above. All modeling was based on wet weather flow. The results of that modeling are discussed below.

Results and Recommendations

As indicated by the city and verified by JTL's modeling, the manholes located just upstream of the Blue Lick School Pump Station are subject to being surcharged to the point of overflowing in high flow events. JTL's modeling of the existing system during a wet weather event indicates that surcharging of the existing collection system extends up through almost the entire collection system in both Mallard Crossing and the Enclaves. Modeling results are shown on The **Blue Lick School Pump Station – Existing Pump Profile** in **Appendix A**. JTL's analysis indicates that high water-overflow conditions associated with the Blue Lick School Pump Station as well as surcharge conditions throughout both the Mallard Crossing and the Enclaves collection systems can be alleviated by either increasing the capacity of the existing station to 20 to 25 horsepower or by constructing a peak storage facility adjacent to the existing station. The **Blue Lick School Pump Station – New Pump Profile** in **Appendix A**, indicates the results that can be expected if the pump station is upgraded. The detailed preliminary cost estimates in **Appendix B** list the required components for each option.

Modeling efforts indicate that the Transmission Shop Pump Station is adequately sized. Peak wet weather flow into the station is 1,500 gallons per minute (GPM) and JTL's model indicates the station has the capacity to pump 1,700 GPM. High pressure and high velocity, and hence surge pressure, plague the Transmission Shop Pump Station. JTL's model indicates that velocities in the station piping reach 27 feet per second (FPS) and 11 FPS in the force main. Pressures, not including surge, reach 145 pounds per square inch (PSI) in the valve vault piping. Rather than increase the station horsepower, JTL is recommending that the City upgrade the station and force main piping. It should be noted that neither the City nor JTL has been able to confirm the diameter of the existing force main. JTL's model assumes the existing force main is 8 inches in diameter. JTL recommends that the City have the line vacuum excavated and force main diameter confirmed before proceeding with any recommended improvements to the force main.

JTL looked at multiple routes for constructing a gravity main that would eliminate the need for the three pump stations (Shepherds Glen Pump Station, Hickory Acres Pump Station and River Oaks Pump Station) located along Mud Run. Pipe slopes were too flat and/or pipe sizes were too large on all but one route. The only feasible route, and the route requiring the least amount of pipe, is shown on the included Plan sheet- **Gravity Option – East of River Oaks** in **Appendix A.** The Gravity Option – East of River Oaks also eliminates the Raymond Road Pump Station. The second option that would eliminate the three Mud run pump stations would require that the Raymond Road Pump Station be relocated. The relocated Raymond Road Pump Station and required sewer lines are shown on the included plan sheet **Mud Run Interceptor and New Raymond Road Pump Station and Force Main** in **Appendix A**.

The last recommended, and lowest priority project is to eliminate the Pointe Pump Station. This is also the least costly of all the recommended capital improvement projects. **The Pointe – Plan View and the Point Profile** are included in **Appendix A**.

Table 1 below prioritizes and provides a cost estimate for each of the capital improvement projects , including options, that JTL recommends the City undertake to.

Table 1: Prioritization of Capital Improvement Projects

Priority	Project	Option	Estimated Cost
1	Blue Lick School Pump Station	Option 1A- Increase Pump Station Capacity	$345,000
	Blue Lick School Pump Station	Option 1B- Peak Storage Facility	$315,000
2	Transmission Shop Pump Station and Force Main Upgrade		$665,000
3	Eliminate Pump Stations along Mud Run	Option 3A- Gravity Option East of River Oaks	$3,000,000
	Eliminate Pump Stations along Mud Run	Option 3B- Mud Run Interceptor and New Raymond Road Pump Station	$3,000,000
4	Eliminate the Pointe Pump Station		$120,000

Detailed preliminary cost estimates for each of the options presented above are included in **Appendix B-Project Cost Estimates.**

Request

9. Refer to the Response to Staff's First Request, Item 35, KY2022- 00015_BW_0406 and 401 KAR 5:002.

a. State whether any regional sewer system, including the city of Shepherdsville's system, is currently "available" as that term is used in 401 KAR 5:002.

b. Explain whether Bluegrass Water expects any regional sewer system, including the city of Shepherdsville's system, to become "available" as that term is used in 401 KAR 5:002, in the next ten years.

c. State whether any representative of the Energy and Environmental Cabinet's Department of Environmental Protection (EEC) has indicated to Bluegrass Water their or the EEC's position with respect to a regional sewer system being "available" to connect to Woodland Acres collection system. If so, describe any communication with such representative regarding the availability of a regional sewer system and provide any such communication if it was in writing.

d. Explain whether Bluegrass Water has any reason to believe that the EEC will not renew its discharge permit expiring September 30, 2026, based on the availability of a regional sewer system.

Response

a. Bluegrass is not aware of any WWTP owned by a city, county, or other public body (whether or not part of the City of Shepherdsville's system) with an average daily design capacity larger than 1,000 gpd that is located

- within one (1) mile of its Woodland Acres treatment facilities or
- one (1) mile or more from its Woodland Acres treatment facilities and to which it would be cost effective to connect (per a 20-year present worth cost analysis).

b. Bluegrass does not expect changes or additions to public bodies' facilities within the next ten (10) years such that any WWTP as described in the response to subpart (a) will exist in the surrounding area. However, Bluegrass does not control and cannot completely predict what public bodies might do over the next 10 years or how the EEC's Division of

Water might in the future interpret and apply its regulations, including definitions in 401 KAR 5:002, Section 1, to changed or unchanged circumstances.

c. To date, no such conversations have taken place, and no such position has been communicated to Bluegrass.

d. Bluegrass has no reason to anticipate that the EEC will not renew the current permit; however, it cannot exclude the possibility that the EEC might conclude in 2026 that there is a regional sewer system available to Woodland Acres.

Request

10. Refer to the Response to Staff's First Request, Item 30. Explain how many contractors Bluegrass Water anticipates sending the request for bids or proposals to and how Bluegrass Water will identify contractors from which it will request bids.

Response

At this time, the exact number of requests has not been determined. The bid process will be invitation only and bids will be solicited from at least 3 contractors. Bluegrass will identify contractors by contacting multiple engineering firms and operations firms in the area and requesting recommendations for local companies qualified for the proposed projects. This will ensure qualified local contractors with experience in wastewater construction are included in the bidding process.

Request

11. Provide an update an update on the status of Bluegrass Water's efforts to obtain debt financing, including when Bluegrass Water anticipates requesting approval for the same.

Response

Bluegrass is currently involved in advanced discussions with lenders regarding the terms of financing offers. At this time, Bluegrass expects to request approval for debt financing in 2022 once those discussions have progressed.

Request

12. If Bluegrass Water funded this project with equity financing, explain how it would affect Bluegrass Water's ability to fulfil its plan filed in Case No. 2019-00104[1] to achieve a capital structure with at least 50 percent debt financing.

Response

It remains Bluegrass's intention to achieve a capital structure inclusive of 40% - 50% debt. As discussed in its Response to 2 PSC 11, Bluegrass is in advanced discussions with lenders at the present time. Pending the approval of construction plans by the Commission, a final offer of financing by the lender and subsequent approval by the Commission of the financing application, Bluegrass may be in position to utilize debt funding for all or part of the Woodland Acres projects. Should Bluegrass be required to fund the project with equity financing, the asset value generated would be used to enhance Bluegrass's credit profile and management would continue the pursuit of sufficient debt to achieve the planned capital structure.

[1] *See* Case No. 2019-00104, *Electronic Proposed Acquisition by Bluegrass Water Utility Operating Company, LLC and the Transfer of Ownership and Control of Assets by P.R. Wastewater Management, Inc., Marshall County Environmental Services, LLC, LH Treatment Company, LLC, Kingswood Development, Inc., Airview Utilities, LLC, Brocklyn Utilities, LLC, Fox Run Utilities, LLC, Brocklyn Utilities, LLC, and Lake Columbia Utilities, Inc.* (filed Oct. 31, 2019), Notice and Plan Re: Capital Structure.