



NWA Utility Services Inc
PO Box 9299
Fayetteville, AR 72703

March 10, 2021

ADEQ
Office of Water Quality
5301 Northshore Drive
N Little Rock, AR 72118-5317

RE: VILLAGES OF CROSS CREEK APARTMENTS PERMIT # 4811-WR-4
Inspection Report Dated 1/22/2021

RESPONSE TO SUMMARY OF FINDINGS

1. Exceedances of permit limits can occur from time to time. All submitted MMR's for the facility have been noted with the explanation and corrective measures taken at the time to resolve the issue. All the elevated TSS parameters are attributed to excessive sludge building. When detected the sludge was pumped by a 3rd party septic hauler. In 2019 a total of 13 loads were removed by Bubs, Inc. In 2020 the exceedance of TSS were reduced over 50% because we contracted to have solids removed on a more frequent basis. This schedule is being maintained and modified as necessary.

2. Due to Covid, we have limited personnel to monitor and record flow on a daily basis 7 days per week. Arrangements have since been made with the maintenance department personnel of the apartment complex to record flows on the days our plant operators are not able to do so, such as on weekends. All effort is made to have one of our operators visits the site daily Monday thru Friday. Record of the flows is taken at that site visit. The data is then recorded into a master flow sheet maintained at the office. These flow reports are included with this response.

3. To resolve this matter, dispersal to the areas showing signs of pooling or ponding are shut of temporarily and the flow is being diverted to other areas in the drip irrigation fields. Because there is infiltration seen to be coming from an adjacent

elevated property to the west of the north fields Sam Dunn, formerly from the AR Dept. of Health has been hired as a consultant to access possible corrective measures that can be taken. His observations and comments follow below.

Sam Dunn R.S.
8336 Mattie Road
Mulberry, AR 72947

Benton County Suburban Sewer District No 1
P.O. Box 9299
Fayetteville, AR 72703

RE: The Villages of Cross Creek
3302 North Dixieland Road
Rogers, AR 72756

The wastewater system for the Villages of Cross Creek consists of a collection system leading to an advance aerobic treatment plant. The final dispersal of treated effluent is routed to varies zones utilizing subsurface drip tubing. The control of effluent dispersal to the varies zones is by both mechanical and electrical devices.

Observations and comments concerning the operations of the wastewater system.

1. Several of the zones are impacted by both surface and subsurface lateral movement of water from property on the up-slope area adjacent to said dispersal zones. The amount of additional water from the up-slope area is increasing the soil saturation within each zone. This increase in soil saturation reduces the available storage capacity for the introduction of said wastewater effluent. In order to mitigate the effects of this situation, the installation of an interceptor drain along the upper area of the dispersal zones is recommended. It is of my opinion this should be the first item of consideration before any of the other items listed in this letter are undertaken.
 - a. The installation of the interceptor drain will pose some difficulty since the available work area is limited. The most common construction practice involves the use of gravel as the media for interceptor drains. However, with the limit on work space for delivery of said gravel for trench construction, I recommend the use of other gravel less trench media products during the construction and installation process.
 - b. In order to collect surface water that would flow over the dispersal zone, a shallow grassy water way should be considered. I observed two natural drainage area which cuts into your dispersal zone with the effect of increasing the soil saturation level, which in turn increases your possibility of wastewater surfacing.

4. Drip field inspections will be recorded after mowing

5. Rope and signage missing from the south drip filed are due to frequent vandalism. A new cable rope and signage will be installed by May 1, 2021.

6. Refer back to Sam Dunn's Observations and Comments as referenced in #3 above. Zone 17 and Zone 12-16 are on land owned by the owners of the apartment complex. Formerly the party was CC-THP Little Flock, and was subsequently deeded over to 2055 A LLC and Delchamps Plaza Associates LLC on January 25, 2021. I would like to request that the appropriate party be contacted by the ADEQ in writing advising them of the appropriate measures to be taken to be in compliance with ADEQ regulations.

7. MMRs are always submitted to the ADEQ. Copies of the missing reports were emailed to Garrett Grimes on February 12. A copy is also included with this response.

8. We have noticed an increase in the solids, specifically FOG in the last few years. BCWD #1, the potable water provider advised us that the demographics have changed greatly for these apartments, supporting the increase of FOG in the waste flow. Because a more frequent pumping schedule needs to be maintained, the rates for the facility have been adjusted accordingly. The solids were removed on March 3, 2021 and will continue to be removed as required.

9. The flow meter will be scheduled to be replaced. This work will be completed by an outside contractor. As of the date of this letter that company has not been determined, but several are in the process of providing a bid for the work. Once all bids are in, one will be selected and the work will be completed.

10. The system is not hydraulically overloaded as indicated in the report. The control panel is set as a timed dose panel, not a Lead, Lag panel. In a timed dose panel, the floats serve different purpose. The mid-level, or "override" condition is there in case an operator is using a lower dosing schedule during the normal cycle and the pumps cannot keep up with the flow, this "override" timer can be adjusted to pump longer cycles to the drip fields in order to catch up with the flow demand. We have our "override" times set the same as the normal cycle times, so we are not putting out any more water than what is put on the field during a "normal" dose cycle.

11. To attain the required FCB limits, a minor modification of the permit allowing for chlorine disinfection will be requested during the permit renewal period. The request is included with the revised WMP to reflect the addition of chlorine disinfection.

12. All future surfacing will be reported in accordance with permit requirements. Regarding hydraulic overloading, please refer back to Sam Dunn's observations and comments as referenced in #3. There is evidence that this field is being hydraulically overloaded from the adjacent property west of the fields. This is due to subsurface flow and above ground drainage from the adjacent property.

13. Records are maintained in house and are included with this response. This will address items 13: 1, 2, 3, & 4

14. Reserve fields owned by the permittee are maintained in accordance with the permit conditions. Reserve fields set aside by the original engineer for the facility and approved for in the construction phase are owned by a 3rd party. They are not accessible due to the design and construction of the apartment complex and underground utilities.

15. Refer back to Sam Dunn's observations and comments as referenced in #3. It is our understanding that the storm drains were installed in some portion of zones 7-11 during the construction phase of the project. We contacted the contractor that put in the drip lines and they advised us that at that time the storm water drainage was already present in the dripfield area. It appears that during the design phase of the drip field the storm drain existed. The engineer was Mark Gross and it appears this design was approved by the ADEQ.

GENERAL COMMENTS

- Any Solids removed from the lift station pumps will be stored in a covered container prior to offsite disposal
- We have used the "flow" settings from the design engineer based on the lowest loading rate across the zones. This was done using the flow meters and the gallons the zone was designed to receive in order to calculate the amount of time the entire drip field is dosed. If the lowest loading rate is used in the dose calculations, this should ensure that any one zone is not over dosed. The MMR accounts for max day flow to the field, not to each zone. However, per permit, each zone is limited to the loading rate for that zone. We use a spreadsheet that is broken down per zone loading rate based off the Max Day Flow, this is a calculation based on the loading rate, timer setting for the pump in the control

panel and daily max flow. It allows us to determine if a zone is overloaded. This spreadsheet is attached to the MMR when submitted monthly.

- Fence on the north field damaged by adjacent property owner's tree falling will be replaced by May 1, 2021. The fence on the south east drip field which has been chronically vandalized will be replaced with a steel cable rather than post and rope. This will be completed by May 1, 2021

If you have any further need for explanation, please feel free to contact me.

Regards



Kathryn Bartlett
Internal Operations Manager
NWA Utility Services Inc.
Commissioner
Benton County Suburban Sewer District No 1

BENTON COUNTY SUBURBAN

SEWER DISTRICT NO 1

VILLAGES OF CROSS CREEK PROJECT

WASTE MANAGEMENT PLAN

REVISED VERSION

MARCH 2021

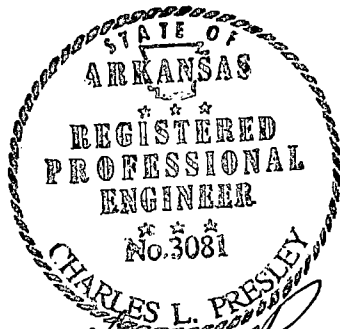
BY

PRESLEY BRANNAN & ASSOCIATES

PO Box 607

Huntsville AR 72740

Charles Presley P.E.



Charles Presley

PROJECT DESCRIPTION

The Villages of Cross Creek project consists of 192 apartments developed over a 23 acre site. The wastewater system consists of a gravity collection system with lift station, designed by Shoemaker Haaland Engineers of Keokuk, Iowa, and a Bioclere package trickling filter system designed by Aquapoint in New Bedford, Massachusetts. In addition to the Bioclere treatment plant, there are two settling tanks at the head of the plant, and a dosing tank to provide storage to dosing the treated wastewater into subsurface drip irrigation located on the property. The original design of the system was submitted by Mark Gross of Rural Engineering Services and permitted for construction in May of 2004. Subsequent permits were issued in 2010 and 2015. This is the 4th permitting cycle for this project.

DESIGN BASIS

The wastewater flow estimates were originally provided by Benton County Water District #1. BCWD #1 collected water usage records from other apartment complexes in the district and doubled the actual usage rates for the existing apartments. The per unit usage (twice the per unit usage for the existing apartments) was multiplied by the number of units in the apartment project to estimate the total wastewater flow.

The original design calculation was as follows:

Per unit water usage provided by Benton County Public Water District #1 for existing apartment complex-88.7 gallons per unit

Doubled rate=166 gallons per day per unit

Estimated for Villages of Cross Creek =192 X 166 GPD =31,872 GPD

FLOW RATES BASED ON HISTORIC DATA

Since this facility was constructed many years ago, there now exists empirical data for the water usage. The following water usage and flow rates are an accurate representation for this facility

	WATER USAGE BCWD #1		DAILY MAX FLOW TO DRIPFIELD
	Monthly Total	Daily Average	
Jul-20	667722	21539	28063
Jun-20	364225	12140	29482
May-20	742402	23948	23083
Apr-20	543088	18103	20937
Mar-20	481065	15518	26988
Feb-20	603527	21554	30326
Jan-20	542717	17507	23834
Dec-19	577090	18616	29678
Nov-19	566234	18875	25626
Oct-19	561643	18117	25284
Sep-19	671195	22373	22456
Aug-19	595091	19196	22414
Jul-19	470195	15168	21756
Jun-19	573956	19132	19281
May-19	503210	16233	19985
Apr-19	549055	18302	25626
Mar-19	457738	14766	21811
Feb-19	651676	23274	21329
Jan-19	515440	16627	21277
Dec-18	599150	19327	32547
Nov-18	573883	19129	20763
Oct-18	591306	19074	24572
Sep-18	789070	26302	29987
Aug-18	741303	23913	25675
Jul-18	688804	22219	21766
AVERAGE	584831	19,238	24581

TREATMENT SYSTEM COMPONENTS

General Description and Function

The treatment system consists of two large settling tanks, with each tank sized for 35,000 gallons nominal capacity. The tanks are followed by a flow splitter provided by Aquapoint. The flow splitter is followed by two Model 36/30 Bioclere treatment units in parallel. The treatment units have media for a fixed film process and are constructed with an integral clarifier under the media for sludge (biomass) collection and recycle. The biomass is recirculated to the primary settling tanks by pumps within the Bioclere unit that were provided as an integral part of the Bioclere package. The treatment units are followed by a 5000 gallon dosing tank with 6 turbine pumps (3 duplex packages) sized to dose the treated wastewater to subsurface drip irrigation tubing. The wastewater will be dispersed into the soil for the final dispersal.

BIOCLERE TREATMENT SYSTEM

The Bioclere is a secondary wastewater treatment system. The first stage of the treatment occurs in the primary tank in which the solids are settled and partially digested. Wastewater then flows from the primary tank to the Bioclere where treatment by the natural process of biochemical oxidation takes place followed by final clarification prior to discharge.

The wastewater enters the baffled zone located in the clarifier beneath the Bioclere filter media module. It is then pumped to the distribution assembly, which doses the surface of the filter media.

The oxidation process occurs as the water trickles over the biological film that grows on the media surface. The pump operates on a timed sequence that is specific to the sites wastewater characteristics to ensure that the dosing rate optimizes filter performance.

In the filter module the biological film thickens until carbonaceous material and oxygen no longer penetrates to the bacteria on the inside surface nearest the media. When this occurs, the biological film sloughs from the media and passes through the media bed into the clarifier where it settles on the bottom. A sludge return pump periodically returns the sludge to the primary tank. Thus the filter media is therefore self-purging and maintenance free

Oxygen is provided by a fan located in the top housing of the Bioclere and is vented either through the effluent line of the system or the biofilter. The fan is sized to provide the proper supply of oxygen to the treatment process.

Wastewater flows via gravity through the Bioclere. The pumps are used only for the treatment process. In the event of a power or pump failure the effluent will continue to pass by gravity through the sump portion of the Bioclere to its point of discharge.

PROCESS CONTROL FOR CARBONACEOUS BIOLOGICAL OXYGEN DEMAND REMOVAL

Wastewater flows from the primary settling tank into a baffled chamber in the clarifier of the Bioclere. Dosing pumps located in this clarifier intermittently dose the PVC filter media bed with the wastewater. In the Bioclere trickling filter the organic material in the wastewater is reduced by a population of microorganisms, which attach to the filter media and form a biological slime layer. Aerobic microorganisms accomplish treatment in the outer portion of the slime layer. As the microorganisms multiply the biological film thickens and diffused oxygen and organic substrate are consumed before penetrating the full depth of the slime layer. Consequently the biological film develops aerobic, anoxic and anaerobic zones.

Absent oxygen and a sufficient organic carbon source (CBOD₅) the microorganisms near the media surface lose their ability to cling to the media. The wastewater flowing over the media washes the slime layer off the media and a new slime layer begins to form. This process of losing slime layer is called "sloughing" and it is a primary function of organic and hydraulic loading on the filter. This natural process allows a properly designed media bed to be self-purging and maintenance free

BIOCLERE TRICKLING FILTER DOSING RATES

The Bioclere uses two alternating dosing pumps to distribute wastewater over the trickling filter. Periodically the nozzles are cleaned of any excess biomass using a bottle brush to ensure uniform distribution. The dosing rates were set at the time of commissioning and are adjusted as required if the Bioclere receives little or no flow.

The dosing rates are set so that the flow of water and pollutants (CBOD5 and ammonium) over the biofilm are maximized. This maximizes the pollutant removal efficiencies and facilitates biomass sloughing through the filter.

Recirculation of sludge and treated effluent is accomplished in each unit using submersible stainless steel pumps controlled by a fully adjustable timer. The biological solids generated in the filter are returned to the sludge storage tanks at regular intervals, typically every hour. The sludge will not collect in the secondary settling tanks and a sludge blanket will not form. The recirculation rates are adjusted depending on the actual average daily flow and strength of the wastewater.

The functions of the Bioclere are controlled by a separate control panel. The Bioclere unit will normally operate without any need for supervision. From time to time conditions occur which activate to audible/visual alarms and require correction. Each Bioclere system has a separate set of alarms which consist of a flasher light on top, and an ON/OFF TEST switch on the front panel. Refer to the Bioclere Technical Manual for complete drawings and details of controls.

SETTLING TANKS

The settling tanks are sized for 48 hours of wastewater flow. Forty-eight hours flow is 63,744 gallons, however since the tanks are manufactured in set sizes, two 35,000 gallon tanks were used. This provides 70,000 gallons of storage or approximately 53 hours of storage at the estimated average daily flow. The settling tanks are fiberglass manufactured by Xerxes Corporation of Minneapolis, MN under IAPMO standards and were tested prior to installation. Ballast for the tanks was constructed as concrete deadmen holding the tanks against buoyant forces by the use of straps over the tanks and into the deadmen. The settling tanks are measured for accumulated sludge and scum by the use of a sludge judge. They are pumped by a septic hauler as required to meet permit limits.

DOSING TANK AND PUMPS

The dosing tank is sized for 5000 gallons or approximately 4 hours of the total daily flow. Pumps from the dosing tank were sized by determining the flow required to dose the largest zones. Two cases were examined- the zone with the highest static head requirement, and the zone with the highest friction head requirement. The pumps were sized to provide flow and head to meet both requirements. The pump sizing is based on the irrigation tubing manufacturers suggested sizing criteria. The pumps are duplexed and each set of zones is served by a duplex pump package in the dosing tank. The pumps are Zoeller model 5034-0010, 2 HP 5 Stage 230 VAC pumps capable of approximately 45 gpm at 158 feet of head. The pump floats, junction boxes and pump vaults are manufactured by Zoeller

Each duplex pump system is followed by a disc meter with local read displays

The dosing tanks are measured for accumulated solids with the use of a sludge judge. They are pumped by a septic hauler as required to meet permit limits.

DRIP IRRIGATION SYSTEM

Area requirements for the drip zones were determined by having soil mapped by an Arkansas Professional Soil Classifier. They along with the original project engineer determined the soil loading rates for drip irrigation and designed the dripfield lines and zones for the project. Detailed design calculations and area sizing and zones identification were performed and submitted to the ADH and ADEQ in May 2004.

The drip irrigation system utilizes pressure compensating subsurface tubing for wastewater #16-2-24 manufactured by Geoflow. The tubing was installed as nearly as possible to contours with no more than one foot of elevation difference between the beginning and the end of each run. The lateral lines are sized with 3-inch PVC for minimized friction loss. Each zone has a supply lateral and a return lateral with sufficient diameters to provide the pressure and flows for dosing and flushing based on the manufacturer's sizing guidelines and software. The Geoflow sizing charts and calculations were included with the technical specifications with the initial permit application.

The drip irrigation system includes a headworks control box manufactured by Geoflow to screen and filter the treated wastewater to a minimum of 100 microns. The head control box includes the screen filter, solenoids to provide a field flush and a screen filter flush, and piping, wiring, and fittings required to complete the head control box in its enclosure

The drip irrigation includes mechanical zones valves to allow the pumps to supply treated wastewater from the dosing tank to each of the zones based upon timed dosing

The controls for the dosing tank, drip irrigation head control box, and displays for the disc meters are enclosed in a separate control box meeting the minimum requirements of NEMA 3R. The controls for the dosing pumps are set, adjusted and programmable to provide scheduled doses ranging from 3 minutes to 60 minutes in a continuous range, and on a scheduled ranging from every 15 minutes up to every 4 hours within a continuously selectable range.

The control panel also includes elapsed time meters and cycle counters for each pump. The panel display shows the total flow through each of the disc meters

PROCESS CONTROL FOR FECAL COLIFORM LIMITS

Disinfection of the wastewater effluent is done by a tablet feeder utilizing Bio Sanitizer disinfecting tablets. Bio- Sanitizer tablets insure dependable disinfection for wastewater treatment systems where a predictable long term source of chlorine is desirable. The tablets are manufactured from pure calcium hypochlorite and contain at least 70% available chlorine. Bio-Sanitizer disinfecting tablets are registered with the USEPA for wastewater treatment. The tablets incorporate beveled edges to enhance the

chemical dissolution pattern, providing effective bacteria killing power. The disinfection occurs in the chamber of the dose tank, where a tablet chlorination unit resides. The tablet chlorinator is constructed of a 3 foot long piece of 3" PVC pipe with a cap on one end and a series of ½" holes drilled around and on the bottom of the pipe. This pipe hangs down into the effluent by a rope that can be raised and lowered for filling. Active chlorine is released into the dosing tank by the incoming treated wastewater eroding the tablets prior to dosing into the drip irrigation system.

AUXILIARY POWER SUPPLY

The facility is equipped with one Kohler Model 80RZG Industrial Generator / Specification GM34436-GA2. This is to keep the lift station, treatment plant and drip irrigation system functioning in the case of a power failure.

ADDITIONAL INFORMATION FOR PERMIT 4815-WR-4

REPAIRS MADE TO THE DRIP IRRIGATION SYSTEM

- Oct 2016 supply and return lines repaired
- Jan 2017 drip pipe repaired
- May 2017 drip pipe repaired
- July 2017 supply and return lines repaired
- August 2019 drip pipe repaired
- Oct 2019 drip pipe repaired
- Dec 2019 drip pipe repaired
- March 2020 drip pipe repaired

Grass seed has been spread on Zones 1-11 to establish more consistent ground cover as follows:

Fescue/Rye Seeding applied in March 2020

Bermuda Seeding applied July 2020

Vegetative cover has been established on the drip dispersal field. This was performed to reduce and eliminate soft spots in the drip field.

CORRECTIVE MEASURES PLANNED

Elevated TSS Limits

Elevated TSS levels are attributed to excessive solids accumulating in the tanks. As the owner and operator, we contract with a septic tank pumping company to pump the solids from the tanks where it is then hauled to an approved location. The pumping schedule has always been a variable based on need. The requirement of the sludge removal is determined by the operator with the use of a "sludge-judge". There is no specific timeline for this as it will be addressed on an as needed basis. Our operators will inspect the tanks on a regularly scheduled basis to address this before it has an effect on TSS limits. With the next permit limit being increased to 45, there should be minimal chance of this permit excursion occurring.

Soft Areas and Isolated Ponding in Drip Field

The vast majority of the drip system seems to be in working order. When checking for leaks, the areas where surfacing effluent is occurring is excavated and the drip tubing inspected. The emitter(s) seem to be working perfectly, but the effluent has created a "chimney" towards the ground surface. There is always an occasional line that has been chewed on by rodents, etc. but these areas are normally pretty obvious and easily repaired. There have been cases where the fittings have come loose and this is repaired easily by the replacement of the fitting. Supply and return lines have also been repaired due to fittings needing to be replaced. The field is inspected after each mowing. If surfacing or ponding is detected repairs will be made and corrected to comply with permit requirements.

The drip irrigation field was inspected by Sam Dunn in March 2021. His observations and comments are outlined in the Response to Summary of Findings from the ADEQ Inspection Report dated 1/22/2021. It

was noted that several zones are impacted by both surface and subsurface lateral movement of water from property on the up-slope area adjacent to the dispersal zones. To mitigate this problem the installation of an interceptor drain along the west side of the upper field is planned to be completed for this facility. This will reduce the noted soil saturation increasing the available storage capacity for treated wastewater into the drip field zones.

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NWA UTILITY SERVICES INC
PO BOX 9299
FAYETTEVILLE AR 72703
US

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ACTWGT: 5.00 LB MAN
CAD: 0167450/CAFE3407
BILL SENDER

TO **ADEQ**
OFFICE OF WATER DRIVE
5301 NORTSHORE DRIVE

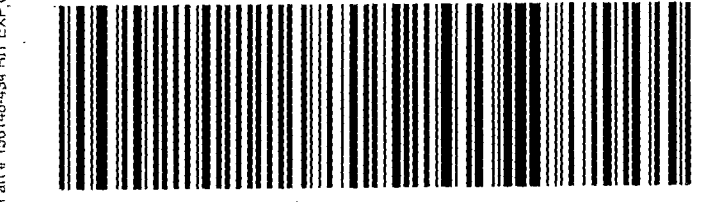
NORTH LITTLE ROCK AR 72118 (US)



TRK# 9552 9988 0722

72118

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Part #: 156148-434 RIT EXP. 09/21

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5301 NORTSHORE DRIVE
NORTH LITTLE ROCK, AR 72118-3228-01
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