Filed Electronically in TPUC Docket Room on 11/27/2018

AquaGreen Utility Inc.

Docket No.
18-00122

November 21, 2018

Honorable Robin Morrision Chairman
Public Utility Commission
502 Deaderick Street 4th floor
Nashville, TN 37243

RE: Petition to amend Certificate of Convenience and Necessity

Dear Chairman Morrison,

Aqua Green Utility Inc. desires to expand its service area to include a portion of Maury County in Tennessee known as the Flat Creek Subdivision at the intersection of Highway 431 and Will Brown Rd. The attached Petition is in support of our request. A tariff sheet of our current residential rate and other documentation is included for your consideration.

We have also included an updated Sewer Service Contract Agreement. With this one change to our agreement we are hoping to address concerns made by TDEC. These concerns are based on plants that would not have enough capacity and could do damage to the environment causing the entire subdivision permit to be revoked. These sewage plants have a set limit of treated sewage water that the approved soils can absorb, so adding to the plant may not be possible. The proposed plant will be adequately sized for Flat Creek. TDEC concern is that a future owner may try to change the occupancy to something that the plant is not able to accept, i.e. condos on single home lots or restaurants in office lots. If the plant can handle the load we certainly would welcome any customer.

New service may be refused if AGU determines the new service is or will cause a violation of the Tennessee Department of Environment and Conservation SOP permit.

Aqua Green Utility Inc. has the financial capabilities to provide wastewater service for the Flat Creek Subdivision. Currently the financial surety provided by Aqua Green Utility Inc. is in the form of a letter of credit, rather than a bond. It should be noted that the amount is in excess of the minimum we are currently required to maintain. Also, an important consideration is that the letter of credit is fully backed by a certificate of deposit in which the utility collects interest, helping keep the rates down for our customers. Our escrow account is also in excess of the minimum amount required and we have not needed to use any money from our escrow account to date.

Aqua Green Utility Inc. has the technical expertise needed to operate the Flat Creek Subdivision. I have a obtained a State of Tennessee Grade 1 Wastewater Collection System Operator License and a State of Tennessee Biological/Natural Operator Treatment System Operator License. Through our affiliate company, we have designed and will construct a treatment plant that is the same type of operation as our other plants.

Aqua Green Utility Inc. has the managerial capability to operate the Flat Creek Subdivision. The utility has successfully operated since July 2009 with no complaints from our customers. Our surety amounts have steadily increased. We have a established a billing system in which each payment and envelope is scanned to eliminate mistakes as much as possible and verify payments if needed. Our treatment plants report problems to our technicians and report data to a central computer. If a plant does not report that information, an email is sent to our technicians. This type of management system assures that even if a plant has a total failure, we will know and take appropriate action in a timely fashion.

There is a need for our service since there is no municipal sewage available in this area. The developer of this subdivision is also a builder and the subdivision is expected to be built out within 3 years of completion. Aqua Green Utility would like to include the capitol contribution amount of $182,000.00 which includes the sewer treatment plant, and the land. We have included the contracts that show the land will be titled to Aqua Green Utility as soon as work begins.

Thank you for your consideration.

Sincerely,

Dart Kendall President
Aqua Green Utility Inc.

ATTACHMENT 1

Aqua Green Utility Inc.

SEWER SERVICE CONTRACT AGREEMENT

DATE:_____

PRINTED NAME

ADDRESS OF PROPERTY

MAILING ADDRESS

TELEPHONE NUMBER **EMAIL ADDRESS**

I hereby make application to Aqua Green Utility Inc. (AGU) for sewer service at the address of property stated above. In consideration of the undertaking on the part of AGU to furnish sewer service, I understand, covenant and agree as follows:

1. I understand that the components of a sewer system have been installed on the property referred to above, which is owned or occupied by me, and which is to be connected with a wastewater disposal system owned and/or maintained by AGU. I warrant that any connection to and/or subsequent use to this system by the components on my property shall be in accordance with the Rules, Regulations and Plans of AGU. Regarding my usage of the system components on my property, which are owned by me, I covenant to follow the guidelines set forth in the Owners User Manual. Should I violate these Rules and/or abuse or damage my components, I understand that I must bear the expense to repair or replace the same in accordance with the Plans of AGU.
2. I acknowledge AGU, its successors and assigns, have a perpetual easement in, over, under and upon the above specified land as shown on the property plat, with the right to operate and repair all components of the sewer system on my property, including but not limited to the septic tank and septic pump tank systems. I further grant AGU permission to enter upon my property for any reason connected with the provision or removal of sewer service or collection therefore.
3. For all other plumbing and structures on the property, including the outfall line to the septic tank, I agree that I am responsible for all operation and repair thereof.
4. I agree to promptly pay for service at the then current schedule or rates and fees and agree to abide by and be subject to AGU's billing and cutoff procedures. Should I not pay in accordance with AGU's rules, I agree to pay all reasonably incurred cost of collection of delinquent fees including attorney fees.
5. I accept the current Rules and Regulations and the Rates and Fees Schedule and agree to abide by any amendments to such Schedules as approved by the Tennessee Public Utility Commission. New service may be refused if AGU determines the new service is or will cause a violation of the Tennessee Department of Environment and Conservation SOP permit.
6. I agree that this Agreement shall remain in effect for as long as I own, reside upon or rent the above-described property. When such circumstances no longer exist, I agree to provide notice to AGU at least thirty (30) days in advance of my vacating the property.
7. I agree to allow AGU to install an approved cut off valve between the house and water supply and grant AGU exclusive rights to use such valve to cut off water in order to safely stop wastewater flow. I understand there will be a charge of $100.00 for installation of this valve.

_____

SUBSCRIBERS SIGNATURE

BEFORE THE TENNESSE PUBLIC UTILITY COMMISION

NASHVILLE, TENNESSEE

NOVEMBER 21. 2018

IN RE:	)	
	)	
PETITION OF AQUA GREEN UTILITY INC. TO AMEND	)	**DOCKET NO: _____**
ITS CERTIFICATE OF PUBLIC CONVENIENCE AND	)	
NECESSITY FOR THE SERVICE PART OF MAURY	)	
COUNTY, TENNESSEE KNOWN AS FLAT CREEK	)	
SUBDIVISION @ THE CORNER HWY 431 AND WILL BROWN	)	
AND THE CORNER OF 431 AND TOBE ROBERTSON RD	)	

PRE-FILED DIRECT TESTIMONY OF DART KENDALL

Q. State your name for the record and your position with the Petitioner, Aqua Green Utility Inc.

A. Dart Kendall. I am the president of the Aqua Green Utility Inc.

Q. What is the business of Aqua Green Utility Inc.?

A. To provide environmentally friendly and affordable wastewater service to communities where wastewater service is not currently available.

Q. When did the Company receive its first certificate from the Authority to operate a sewer system in Tennessee?

A. July 31, 2009

Q. How many certificates has the Company received from the Authority to provide sewer service in the State of Tennessee?

A. 4, The Peninsula, Stonebridge, Cedar Brooke Subdivisions and McNairy Loves.

Q. What services will Aqua Green Utility Inc. provide to Flat Creek Subdivision?

A. Aqua Green Utility will provide wastewater service: Including all maintenance of the sewer treatment tanks, main lines and

drip field. All operation and maintenance will be done in a manner as to meet all requirements of the state operating permit.

Q. Does Aqua Green Utility Inc. have the technical, managerial, and financial capability to provide wastewater service to the Flat Creek Subdivision?

A. Yes, Aqua Green Utility Inc. staff and associates have all the necessary technical, managerial, and financial capability to provide wastewater service to the Flat Creek Subdivision located at Hwy 431 and Will Brown Road And Tobe Robertson Rd. I additionally hold a BNS sewage treatment plant operators license and a sewage collection system operators license issued by the State of Tennessee. Our financial surety is in the form of a letter of credit backed by a CD and is in excess of the amount currently required.

Q Is there a stated public need for wastewater service in this area?

A. Yes, we have been requested to provide wastewater service by the developer of the Flat Creek Subdivision. I have included a copy of a letter requesting that the service be provided. I have contacted the other utilities in the area and they have no plans to provide service to this location.

Q. Will Aqua Green Utility Inc. abide by all applicable Tennessee statues and TPUC rules governing wastewater utilities?

A. Yes, Aqua Green Utility Inc. will abide by all applicable Tennessee statues and TPUC rules governing wastewater utilities, including 1220-04-13.09(7)

Q. How many customers will be served in this development?

A. Aqua Green Utility Inc. will service 108 homes and 15 commercial lots.

Q. Identify any complaints filed with any state regulatory agency involving Aqua Green Utility Inc.

A. There have never been any complaints filed against Aqua Green Utility Inc.

Q. Will Aqua Green Utility Inc. collect additional moneys from the developer of the Flat Creek in order to pay the federal tax owed for Capitol Contributions?

A. Yes, Aqua Green Utility Inc. will collect $48,375.60 to cover the cost of the federal tax on the Capitol Contribution. This total amount will be paid to the IRS to cover the taxable amount.

Q. Discuss in detail the type of wastewater system Aqua Green Utility Inc. proposes for construction, which will support the Flat Creek Subdivision at

Hwy 431 and Will Brown Rd, Maury County, Tennessee.

A. A fully automated trickle filter plant capable of supporting all sewage treatment needs at the Flat Creek Subdivision. The plant features autonomous redundancy of major components, as well as leak detection and isolation technology. This is a trickle type system where sewage is pumped across media blocks for natural treatment. After treatment, the water is disposed of through drip emitter tubing installed in the soil.

Q. Provide a timeline for construction of the wastewater system.

A. It is expected to take 90 to 120 build days

Does this conclude your pre-filed testimony?

A. Yes.

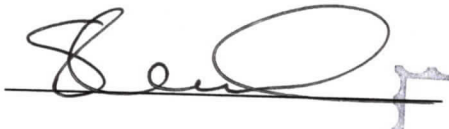
I swear that the foregoing testimony is true and correct to the best of my knowledge and belief.

Dart Kendall

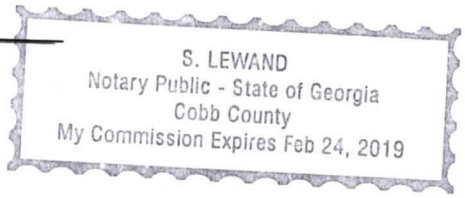
President

Aqua Green Utility Inc.

Subscribed and sworn to me this 21st day of Nov - 2018



Notary Public

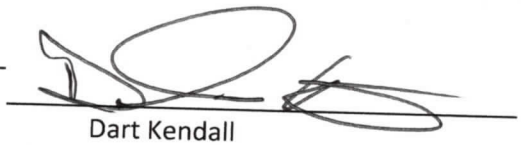


County of COBB

My Commission Expires 2-24-19

CERTIFICATE OF SERVICE The undersigned hereby certifies that the above and foregoing Pre-Filed Direct Testimony of Dart Kendall has been served upon the Tennessee Public Utility Commission, 502 Deaderick Street, Nashville, Tennessee 37243. By the method of Fed Ex.

On this 21st day of Nov 2018



Dart Kendall

AquaGreen Utility Inc.

General Information:

Aqua Green Utility Inc. A Tennessee "C" corporation
865-908-0432
3350 Galts Road
Acworth, GA 30102
Website: aquagreenutility.com

Aqua Green Utility Inc. has 2 officers

Dart Kendall
President

Dart Kendall owns 50% of Aqua Green Utility Inc.
770-966-7772
3350 Galts Rd
Acworth, GA 30102

Becky Kendall
Secretary

Becky Kendall owns 50% of Aqua Green Utility Inc.
770-966-7772
3350 Galts Rd
Acworth, GA 30102

Dart Kendall and Becky Kendall own 50% each of Advanced Septic Inc. Advanced Septic Inc is a private corporation that contracts with the developer to build the treatment plant. Aqua Green Utility Inc. does not pay any monies to Advanced Septic Inc. for any part of the construction of the plant. After the plant is complete Advanced Septic Inc. subcontracts some of the work for the operation of the plant from Aqua Green Utility Inc. Advanced Septic Inc will do quarterly TDEC required water testing or repairs as needed.

Aqua Green Utility Inc. Has no assumed names.

The Flat Creek Neighborhood crosses Hwy 431 in Maury County Tennessee. One side is on the corner of Will Brown Road and Hwy 431. The other side is on the corner of Hwy 431 and Tobe Robertson Rd. This

plant will be called the Flat Creek Plant. The neighborhood will be called Flat Creek. A physical address has yet to be assigned. Lat 35deg 41" 46.31" N - Long 86 deg 50" 13.21" W. There are currently no structures yet built to be serviced by this plant. This plant will be built in 1 phase.

The type of wastewater plant to be built is a trickling filter type. This will be a Programmable Logic Controller with custom software. The treated wastewater will be finally disposed of through drip irrigation. The plant is designed for 36,000 gallons per day or .036 MGD. The construction of the plant is expected to start within one year of receiving approvals. It is estimated to take 90 to 120 day to build this plant. Once complete the plant will be put in service as soon as the first home is complete and brought online when enough sewage has entered the plat to start operation.

This plant will be built in one phase.

The developer for this project is Justin Hicks his best mailing address is 3542 Jim Warren Road. Spring Hill Tennessee. Best contact is at 615-260-5523 justin@colesignaturehomes.com

Aqua Green Utility Inc has no franchise agreement with Maury County. Maury County does require a utility to first be approved to operate in there county and Aqua Green Utility Inc has been approved all ready.

Managerial Ability

Dart Kendall, president, has 18+ years in the wastewater business and 38+ years owning his own business along with working 30 years in the Cobb County Fire Dept. In the state of TN he holds a BNS sewage treatment plant operators license and a sewage collection system operators license. He also has a residential, commercial, drip and septic tank pumper license in the state of Georgia.

Rebecca Kendall, secretary, has 18+ years in the wastewater business and 16 years prior to that working as a merchandising manager for Milliken and Co. in which she managed several different divisions. She is also a 1980 graduate of Clemson University who graduated with honors.

Aqua Green Utility is certified as a wastewater provider in the state of TN.

Aqua Green Utility does not have any pending mergers or acquisitions.

Advanced Septic Inc., the party contracted to install the proposed system, has a valid and current contractor's license by the applicable licensing board of the State of TN. See attached.

For any technical questions or concerns please contact Dart Kendall 865-908-0432.

Aqua Green Utility reported a permit violation to TDEC on the Loves McNairy plant for one BOD reading in the first quarter of operation. The plant now meets required standards.

A signed engineering report is included.

This information is from my CPA
It would be considered nonresidential real estate, which is depreciated over 39 years. The first year the rate depends on what month it goes into service, but after the first year it's 2.564% (ie $10,174). See this table for year 1 and year 40 rate (from pub 946):

Table A-7a. **Nonresidential Real Property**
Mid-Month Convention
Straight Line—39 Years

Year	Month property placed in service											
	1	2	3	4	5	6	7	8	9	10	11	12
1	2.461%	2.247%	2.033%	1.819%	1.605%	1.391%	1.177%	0.963%	0.749%	0.535%	0.321%	0.107%
2-39	2.564	2.564	2.564	2.564	2.564	2.564	2.564	2.564	2.564	2.564	2.564	2.564
40	0.107	0.321	0.535	0.749	0.963	1.177	1.391	1.605	1.819	2.033	2.247	2.461

The cost of the plant will be paid by the developer and the plant and drip fields will be deeded to the utility. These details and how capitol contribution cost for federal taxes have been calculated are included within the confidential contract.

Sincerely,

Dart Kendall President
Aqua Green Utility Inc.

ON Time Post Cards

AquaGreen Utility Inc.

Make Check payable to:
Aqua Green Utility Inc.
3350 Galts Road
Acworth GA 30102

The Peninsulas At Douglas Lake

Lot number 41 [redacted]

Monthly Service For: November 2018

Total Amount Due: 44.53

Due Date 12/10/2018

Water Saving tip: Make sure there are water-saving aerators on all of your faucets

12/10/2018 44.53

RETURN THIS STUB WITH PAYMENT

[redacted]

[redacted]

AquaGreen Utility Inc.

Make Check payable to:
Aqua Green Utility Inc.
3350 Galts Road
Acworth GA 30102

Stonebridge

Lot number 61 [redacted]

Monthly Service For: November 2018

Total Amount Due: 44.53

Due Date 12/10/2018

Water Saving tip: Make sure there are water-saving aerators on all of your faucets

12/10/2018 44.53

RETURN THIS STUB WITH PAYMENT

[redacted]

[redacted]

Boca Raton FL 33487

AquaGreen Utility Inc.

Make Check payable to:
Aqua Green Utility Inc.
3350 Galts Road
Acworth GA 30102

Stonebridge

Lot number 22 [redacted]

Monthly Service For: November 2018

Total Amount Due: 44.53

Due Date 12/10/2018

Water Saving tip: Make sure there are water-saving aerators on all of your faucets

12/10/2018 44.53

RETURN THIS STUB WITH PAYMENT

[redacted]

[redacted]

Waynesville NC 28785

AquaGreen Utility Inc.

Make Check payable to:
Aqua Green Utility Inc.
3350 Galts Road
Acworth GA 30102

Stonebridge

Lot number 93 [redacted]

Monthly Service For: November 2018

Total Amount Due: 44.53

Due Date 12/10/2018

Water Saving tip: Make sure there are water-saving aerators on all of your faucets

12/10/2018 44.53

RETURN THIS STUB WITH PAYMENT

[redacted]

[redacted]

Slidell LA 70461

Late Envelope

AquaGreen Utility Inc.

3350 Galts Road
Acworth, GA 30102

Customer Service # 865-908-0432

Customer No. [redacted]

Bill To:

[redacted]

Franklin NC 28734

Service Location:

Stonebridge

Lot # 38

Previous Balance	5 % late Charge	Due Date	Total Amount Due
[redacted]	[redacted]	12/10/2018	[redacted]

Payment is Past Due. Please Remit.

Annual Access Fee For: 7/1/2018 to 7/1/2019

Why is there a bill if I don't live on my property yet? Many times there are not enough customers living in a community to generate enough income to pay for required water testing, certified operator visits and maintenance on components. This is a Tennessee Regulatory Authority approved funding method to maintain the system and protect your investment, so when you move onto the property the system is in full operational top condition. If you need help paying your bill give us a call we can help 865-908-0432

Please detach and return this portion with payment

[redacted]

[redacted]

Franklin NC 28734

Total Amount Due: [redacted]

Due Date: 12/10/2018

5% Added After Due Date

Make check or money order payable to:

Aqua Green Utility Inc.
3350 Galts Road
Acworth, GA 30102

SUNTRUST

DATE: JULY 13, 2018

BENEFICIARY:
TENNESSEE REGULATORY AUTHORITY
460 JAMES ROBERTSON PARKWAY
NASHVILLE, TN 37243

APPLICANT:
AQUA GREEN UTILITY INC
1361 MAIN ST.
WHITE PINE, TN 37890

AMENDMENT TO IRREVOCABLE STANDBY LETTER OF CREDIT

OUR REFERENCE NUMBER: F853673
AMENDMENT NUMBER: 4

THIS AMENDMENT IS TO BE CONSIDERED AS PART OF THE ABOVE MENTIONED CREDIT AND MUST BE ATTACHED THERETO.

THE AMOUNT IS INCREASED BY: USD $9,000.00

TOTAL AMOUNT NOW TO READ: USD $32,000.00

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

PLEASE DIRECT ALL INQUIRIES TO: PHONE 800-951-7847 OPTION 3.

SINCERELY,

SUNTRUST BANK

AUTHORIZED SIGNATURE

Boxley
President

 77853673

COPY

State of Tennessee

Department of State
Corporate Filings
312 Eighth Avenue North
6th Floor, William R. Snodgrass Tower
Nashville, TN 37243

CHARTER
(For-Profit Corporation)

For Office Use Only

FILED
2008 OCT 24 PM 12:51
RILEY DARNELL
SECRETARY OF STATE

5392 1554

The undersigned acting as incorporator(s) of a for-profit corporation under the provisions of the Tennessee Business Corporation Act adopts the following Articles of Incorporation.

1. The name of the corporation is:
AQUA GREEN UTILITY, INC.

[NOTE: Pursuant to Tennessee Code Annotated § 48–14–101(a)(1), each corporation name must contain the words *corporation, incorporated,* or *company* or the abbreviation *corp., inc.,* or *co.*]

2. The number of shares of stock the corporation is authorized to issue is: 1000

3. The name and complete address of the corporation's initial registered agent and office located in the State of Tennessee is:
Ronald Barnes
(Name)
3325 Buckhorn Road   Sevierville   TN
(Street Address)   *(City)*   *(State/Zip Code)*
Sevier
(County)

4. List the name and complete address of each incorporator:
Charles Campbell 315 W Ponce de Leon Ave. Ste. 810 Decatur, GA. 30030
(Name)   *(Include: Street Address, City, State and Zip Code)*

(Name)   *(Street Address, City, State and Zip Code)*

(Name)   *(Street Address, City, State and Zip Code)*

5. The complete address of the corporation's principal office is:
3325 Buckhorn Road   Sevierville   TN. 37864
(Street Address)   *(City)*   *(State/County/Zip Code)*

6. The corporation is for profit.

7. If the document is not to be effective upon filing by the Secretary of State, the delayed effective date and time are:
Date ______, ______, Time ______ (Not to exceed 90 days.)

8. Other provisions:
None

October 20, 2008
Signature Date

Charles Campbell
Incorporator's Signature

Charles Campbell
Incorporator's Name *(typed or printed)*

SS-4417 (Rev. 9/04)   Filing Fee: $100   RDA 1678

Google Maps

Map data ©2018 Google 2000 ft

Home

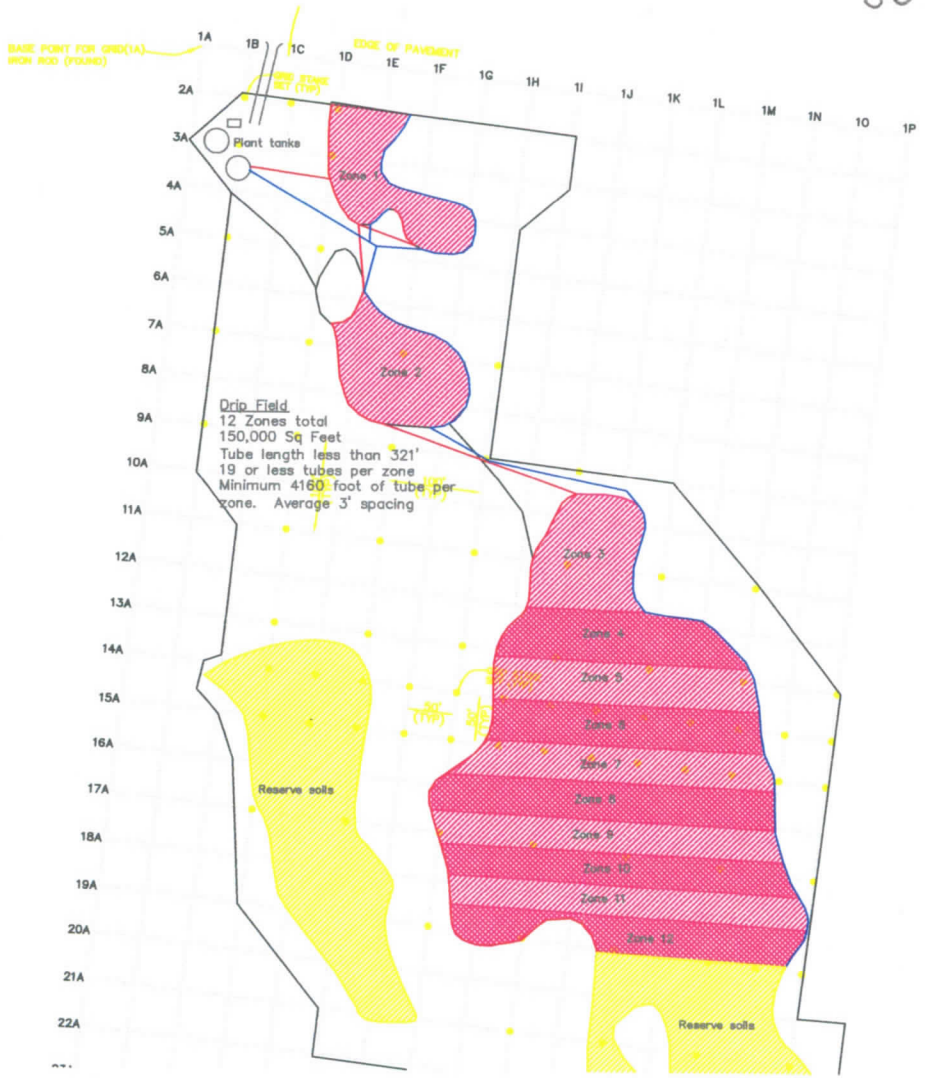
Set a work address

Google Maps

Home

Set a work address

35° 41' 46.31" N
86° 50' 13.21" W



Utility Property

LOT TABLE	
15	RESIDENTIAL LOTS (1 ACRE)
108	COMMERCIAL LOTS (1 ACRE OR LARGER)
123	TOTAL LOTS

OWNER OF RECORD
X
DEED BK. XXXX P.G. XXX, MAP XXX PARCEL XX

APPLICANT
T-SQUARE ENGINEERING
701 WEST MAIN ST
FRANKLIN, TN 37064
615.678.8212

T-SQUARE ENGINEERING
701 WEST MAIN STREET • FRANKLIN, TN • 615-678-8212 • WWW.T2-ENG.COM

REVISIONS

NO.	DATE

DATE: 7.11.2018
SCALE:
DRAWN BY: T-SQUARE
REVIEWER: TET

3465 LEWISBURG PIKE
COLUMBIA TN 38401
MAURY COUNTY, TENNESSEE

3503 LEWISBURG PIKE

PROJECT
18-0130

SHEET
C-1.0

Tre Hargett
Secretary of State

Division of Business Services
Department of State
State of Tennessee
312 Rosa L. Parks AVE, 6th FL
Nashville, TN 37243-1102

Filing Information

Name: **AQUA GREEN UTILITY, INC.**

General Information

SOS Control #	**000589191**	Formation Locale:	TENNESSEE
Filing Type:	For-profit Corporation - Domestic	Date Formed:	10/24/2008
	10/24/2008 12:51 PM	Fiscal Year Close	12
Status:	Active		
Duration Term:	Perpetual		

Registered Agent Address
DART KENDALL
1361 MAIN ST
WHITE PINE, TN 37890-3506

Principal Address
3350 GALTS RD
ACWORTH, GA 30102-1132

The following document(s) was/were filed in this office on the date(s) indicated below:

Date Filed	Filing Description	Image #
02/02/2018	2017 Annual Report	B0490-4780
	Registered Agent Physical Address 1 Changed From: 510 PROVIDENCE DR To: 1361 MAIN ST	
	Registered Agent Physical City Changed From: JEFFERSON CITY To: WHITE PINE	
	Registered Agent Physical Postal Code Changed From: 37760-3860 To: 37890-3506	
02/04/2017	2016 Annual Report	B0343-4864
02/02/2016	2015 Annual Report	B0190-9594
12/31/2014	2014 Annual Report	B0001-9884
01/18/2014	2013 Annual Report	A0208-2633
01/29/2013	2012 Annual Report	A0152-0162
	Principal Postal Code Changed From: 30102 To: 30102-1132	
12/22/2011	2011 Annual Report	A0097-2893
01/17/2011	2010 Annual Report	A0053-3124
04/19/2010	2009 Annual Report	A0019-0811
04/08/2009	2008 Annual Report	6515-0922
	Principal Address Changed	
	Registered Agent Physical Address Changed	
	Registered Agent Changed	
03/31/2009	Administrative Amendment	6495-2730

Filing Information

Name: **AQUA GREEN UTILITY, INC.**

Mail Address Changed		
11/03/2008	Administrative Amendment	6394-2530
Mail Address Changed		
10/24/2008	Initial Filing	6392-1554

Active Assumed Names (if any)	Date	Expires

FORM UD-20
(Excel Format)

Copy

TENNESSEE PUBLIC UTILITY COMMISSION
STATEMENT OF GROSS EARNINGS AND COMPUTATION OF INSPECTION FEE
DUE DATE: April 1, 2018

COMPANY ID #: 129065
COMPANY NAME: Aqua Green Utility Inc.

State the gross receipts from all sources of the utility for the **calendar year 2017 per** T.C.A. § 65-4-303:

Energy & Water Gross Receipts IN TENNESSEE:

Gas Revenues	
Electric Revenues	
Water Revenues	
Wastewater Revenues	$ 23,272.00
Miscellaneous	
TOTAL TENNESSEE INTRASTATE GROSS RECEIPTS	$ 23,272.00

COMPUTATION OF FEE

1. Tennessee Intrastate Gross Receipts		$ 23,272.00
2. Less Exemption		$ (5,000)
3. Net Tennessee Gross Receipts	(Line 1 minus Line 2)	$ 18,272
4. Computed Fee (Line 3 x 0.425%)		$ 77.66
5. **TOTAL INSPECTION FEE**	**(THE GREATER OF LINE 4 *OR $100)***	$ 100.00

NOTE: A PENALTY OF 10% PER MONTH OR FRACTION THEREOF, PURSUANT TO T.C.A. § 65-4-308, WILL BE ASSESSED FOR LATE PAYMENT IF NOT PAID ON OR BEFORE APRIL 1st.

I attest that I have the authority to submit this form on behalf of the regulated entity and that the figures above accurately state the gross receipts from all sources of the utility in Tennessee for the Calendar Year 2017.

NAME: Dart Kent II (Please Print)
SIGNATURE:
TITLE: President
TELEPHONE: 865-908-0432
DATE: 4/1/2018
EMAIL: dart@aquagreenutility.com

2017

Area For Internal Use Only

Please Remit Form To:
Tennessee Public Utility Commission
502 Deaderick Street, 4th Floor
Nashville, TN 37243-0001

Post Marked ___/___/____

TABLE OF CONTENTS

F-2

Name of Respondent Your Company Name	This Report is: (1) _X_ An Original (2) ___ A Resubmission	Date of Report (Mo. Da. Yr) Date report compil	Year of Report Fiscal Year End Date

IDENTIFICATION & OWNERSHIP

Report of: Aqua Green Utility Inc
(REPORT THE EXACT NAME OF UTILITY)

Located at: 510 PROVIDENCE DR
JEFFERSON CITY, TN 377603860 USA

Year Ended:

Date Utility was Originally Organized:
10/24/2008

Location of Office Where Accounts and Records are Kept:
3350 Galts Road Acworth, GA 30102

Give the Name,Title,&Office Address of the Officer of the Utility to Whom Correspondence Should be Addressed Conc
Dart Kendall (President)
Becky Kendall (Secretary)
Telephone: 865-908-0432 (Cell 404-557-3170)

OFFICERS & MANAGERS

NAME	TITLE	SALARY
Dart Kendall	President	
Rebecca (Becky) Kendall	Secretary	

OWNERSHIP

Report every corporation or individual owning or holding directly or indirectly 5 percent or more of the voting securities o the reporting utility.

Name (a)	Address (b)	Percent Ownership In Utility (c)	Salary Charged Utility (d)	Meetings Attended During Year (e)

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) _X_ An Original (2) A Resubmission	(Mo, Da, Yr) Date report compil	Fiscal Year End Date

INCOME STATEMENT

Account Name (a)	Ref Page (b)	Water (c)	Sewer (d)	Other (e)	Total (f)
Gross Revenue:					
Residential		-	23,272	-	23,272
Commercial		-	-	-	-
Industrial		-	-	-	-
Multi-Family		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Piease Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Total Gross Revenue		-	**23,272**	-	**23,272**
Operation & Maint. Expense	W3/S3	-	16,011	-	16,011
Depreciation Expense	F-5	-	-	-	-
Amortization Expense		-	-	-	-
Other Expense (Please Specify)		-	-	-	-
Other Expense (Please Specify)		-	-	-	-
Taxes Other Than Income	F-7	-	512	-	512
Income Taxes	F-7	-	1,012	-	1,012
Total Operating Expenses		-	**17,535**	-	**17,535**
Net Operating Income		-	**5,737**	-	**5,737**
Other Income:					
Nonutility Income		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Total Other Income		-	-	-	-
Other Deductions:					
Misc. Nonutility Expenses		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Other (Please Specify)		-	-	-	-
Total Other Deductions		-	-	-	-
Net Income		-	**5,737**	-	**5,737**

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) _X_ An Original (2) _ A Resubmission	(Mo, Da, Yr) Date report compil	Fiscal Year End Date

NET UTILITY PLANT

Plant Accounts (101-107) Inclusive (a)	Water (c)	Sewer (d)	Other (e)	Total (f)
Utility Plant in Service (101)	0	0	0	0
Construction Work in Progress (105)	0	0	0	0
Other (Please Specify)	0	0	0	0
Other (Please Specify)	0	0	0	0
Other (Please Specify)	0	0	0	0
Other (Please Specify)	0	0	0	0
Other (Please Specify)	0	0	0	0
Other (Please Specify)	0	0	0	0
Total Utility Plant	**0**	**0**	**0**	**0**

ACCUMULATED DEPRECIATION AND AMORTIZATION OF UTILITY PLANT

Account 108 (a)	Water (c)	Sewer (d)	Other (e)	Total (f)
Balance First of Year	**0**	**0**	**0**	**0**
Credits During Year:				
Accruals charged to Depreciation Account	0	0	0	0
Salvage	0	0	0	0
Other Credits (Please Specify):	0	0	0	0
Other Credits (Please Specify):	0	0	0	0
Other Credits (Please Specify):	0	0	0	0
Other Credits (Please Specify):	0	0	0	0
Total Credits	**0**	**0**	**0**	**0**
Debits During Year:				
Book Historical Cost of Plant Retired	0	0	0	0
Cost of Removal	0	0	0	0
Other Debits (Please Specify):	0	0	0	0
Other Debits (Please Specify):	0	0	0	0
Other Debits (Please Specify):	0	0	0	0
Other Debits (Please Specify):	0	0	0	0
Total Debits	**0**	**0**	**0**	**0**
Balance End of Year	**0**	**0**	**0**	**0**

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) _X_ An Original	(Mo, Da, Yr)	
	(2) _ A Resubmission	Date report compil	Fiscal Year End Date

CAPITAL STOCK (201 - 204)

(a)	Common Stock (b)	Preferred Stock (c)
Par or stated value per share	-	-
Shares Authorized	-	-
Shares issued and outstanding	-	-
Total par value of stock issued	-	-
Dividends declared per share for year	0	0

RETAINED EARNINGS (215)

(a)	Appropriated (b)	Unappropriated (c)
Balance first of year	-	30,055
Changes during year NET INCOME (NET LOSS)	-	6,749
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Balance end of year	0	36,804

PROPRIETARY CAPITAL (218)

NONE (a)	Proprietor (b)	Partner (c)
Balance first of year	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Changes during year (Please Specify)	-	-
Balance end of year	0	0

LONG-TERM DEBT (224)

Obligation including Issue & Maturity Dates NONE (a)	Interest Rate (b)	Year End Balance (c)
Debt #1	0.00%	-
Debt #2	0.00%	-
Debt #3	0.00%	-
Debt #4	0.00%	-
Debt #5	0.00%	-
Debt #6	0.00%	-
Debt #7	0.00%	-
Debt #8	0.00%	-
Debt #9	0.00%	-
Debt #10	0.00%	-
Debt #11	0.00%	-
Debt #12	0.00%	-
Total Long-Term Debt		0

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) X An Original (2) ___ A Resubmission	(Mo, Da, Yr) Date report compiled	Fiscal Year End Date

TAXES ACCRUED (236)

Description (a)	Water (b)	Sewer (c)	Other (d)	Total (e)
Balance First of year	-	-	-	0
Accruals Charged:				
Federal Income Tax	-	1,012	-	1,012
Local Property tax	-	492	-	492
State ad valoren tax	-	-	-	0
TN State Sales Tax	-	-	-	0
Regulatory Assessment Fee	-	-	-	0
Payroll Tax	-	-	-	0
Corporate Annual Report	-	20	-	20
Other Taxes (Please Specify)	-	-	-	0
Total Taxes Accrued	0	1,524	0	1,524
Taxes Paid				
Federal Income Tax	-	1,012	-	1,012
Local Property tax	-	492	-	492
State ad valoren tax	-	-	-	0
TN State Sales Tax	-	-	-	0
Regulatory assessment fee	-	-	-	0
Payroll Tax	-	-	-	0
Corporate Annual Report	-	20	-	20
Other Taxes (Please Specify)	-	-	-	0
Total Taxes Paid	0	1,524	0	1,524
Balance End of Year	0	0	0	0

PAYMENTS FOR SERVICES RENDERED BY OTHER THAN EMPLOYEES

Report all info concerning rate, management, construction, advertising, labor relations, or other professional services rendered to the Utility for which total payments during the year to any Corp, Ptnshp, indiv, or organization of any kind, amounted to $500 or more.

Name of Recipient	Amount	Description of Service

Name of Respondent	This Report is:	Date of Report (Mo, Da, Yr)	Year of Report
Your Company Name	(1) _X_ An Original (2) ___ A Resubmission	Date report compil	Fiscal Year End Date

CONTRIBUTIONS IN AID OF CONSTRUCTION (271)

Description (a)	Water (b)	Sewer (c)	Total (d)
Balance First of Year	-	-	-
Add Credits During Year	-	-	-
Less Charges During Year	-	-	-
Balance End of Year	0	0	0
Less Accumulated Amortization	-	-	-
Net Contributions in Aid of Construction	0	0	0

DITIONS TO CONTRIBUTIONS IN AID OF CONSTRUCTION DURING YEAR (CREDITS)

Report below all developers or contractors agreements fro which cash or property was received during the year (a)	Indicate "Cash" or "Property" (b)	Water (c)	Sewer (d)
Contractor or Developer #1		-	-
Contractor or Developer #2		-	-
Contractor or Developer #3		-	-
Contractor or Developer #4		-	-
Contractor or Developer #5		-	-
Contractor or Developer #6		-	-
Contractor or Developer #7		-	-
Contractor or Developer #8		-	-
Contractor or Developer #9		-	-
Contractor or Developer #10		-	-
Contractor or Developer #11		-	-
Contractor or Developer #12		-	-
Contractor or Developer #13		-	-
Contractor or Developer #14		-	-
Contractor or Developer #15		-	-
Contractor or Developer #16		-	-
Contractor or Developer #17		-	-
Contractor or Developer #18		-	-
Contractor or Developer #19		-	-
Contractor or Developer #20		-	-
Contractor or Developer #21		-	-
Contractor or Developer #22		-	-
Contractor or Developer #23		-	-
Contractor or Developer #24		-	-
Contractor or Developer #25		-	-
Contractor or Developer #26		-	-
Contractor or Developer #27		-	-
Contractor or Developer #28		-	-
Contractor or Developer #29		-	-
Contractor or Developer #30		-	-
Total Credits During Year		0	0

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) _X_ An Original (2) ___ A Resubmission	(Mo, Da, Yr) Date report compil	Date report compiled

SEWER UTILITY PLANT ACCOUNTS

Acct No. (a)	Account Name (b)	Previous Year (c)	Additions (d)	Retirements (e)	Current Year (f)
351	Organization	-	-	-	-
352	Franchises	-	-	-	-
353	Land & Land Rights	-	-	-	-
354	Structures & Improvements	-	-	-	-
360	Collection Sewers - Force	-	-	-	-
361	Collection Sewers - Gravity	-	-	-	-
362	Special Collecting Structures	-	-	-	-
363	Services to Customers	-	-	-	-
364	Flow Measuring Devices	-	-	-	-
365	Flow Measuring Installations	-	-	-	-
370	Receiving Wells	-	-	-	-
371	Pumping Equipment	-	-	-	-
380	Treatment & Disposal Equipment	-	-	-	-
381	Plant Sewers	-	-	-	-
382	Outfall Sewer Lines	-	-	-	-
389	Other Plant & Miscellaneous Equipment	-	-	-	-
390	Office Furniture & Equipment	-	-	-	-
391	Transportation Equipment	-	-	-	-
392	Stores Equipment	-	-	-	-
393	Tools, Shop & Garage Equipment	-	-	-	-
394	Laboratory Equipment	-	-	-	-
395	Power Operated Equipment	-	-	-	-
396	Communication Equipment	-	-	-	-
397	Miscellaneous Equipment	-	-	-	-
398	Other Tangible Plant	-	-	-	-
	Total Sewer Plant	-	-	-	-

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) _X_ An Original (2) ___ A Resubmission	(Mo, Da, Yr) Date report compil	Fiscal Year End Date

ANALYSIS OF ACCUMULATED DEPRECIATION BY PRIMARY ACCOUNT - SEWER

Account Number (a)	Account (b)	Average Service Life in Years (c)	Average Salvage Value in Percent (d)	Depreciation Rate Applied* (e)	Accumulated Depreciation Balance Previous Year (f)	Debits (g)	Credits (h)	Accumulated Depreciation Balance End of Year (i)
354	Structures & Improvements	-	0.00%	0.00%	-	-	-	-
360	Collection Sewers - Force	-	0.00%	0.00%	-	-	-	-
361	Collection Sewers - Gravity	-	0.00%	0.00%	-	-	-	-
362	Special Collecting Structures	-	0.00%	0.00%	-	-	-	-
363	Services to Customers	-	0.00%	0.00%	-	-	-	-
364	Flow Measuring Devices	-	0.00%	0.00%	-	-	-	-
365	Flow Measuring Installations	-	0.00%	0.00%	-	-	-	-
370	Receiving Wells	-	0.00%	0.00%	-	-	-	-
371	Pumping Equipment	-	0.00%	0.00%	-	-	-	-
380	Treatment & Disposal Equipment	-	0.00%	0.00%	-	-	-	-
381	Plant Sewers	-	0.00%	0.00%	-	-	-	-
382	Outfall Sewer Lines	-	0.00%	0.00%	-	-	-	-
389	Other Plant & Miscellaneous Equipment	-	0.00%	0.00%	-	-	-	-
390	Office Furniture & Equipment	-	0.00%	0.00%	-	-	-	-
391	Transportation Equipment	-	0.00%	0.00%	-	-	-	-
392	Stores Equipment	-	0.00%	0.00%	-	-	-	-
393	Tools, Shop & Garage Equipment	-	0.00%	0.00%	-	-	-	-
394	Laboratory Equipment	-	0.00%	0.00%	-	-	-	-
395	Power Operated Equipment	-	0.00%	0.00%	-	-	-	-
396	Communication Equipment	-	0.00%	0.00%	-	-	-	-
397	Miscellaneous Equipment	-	0.00%	0.00%	-	-	-	-
398	Other Tangible Plant	-	0.00%	0.00%	-	-	-	-
	Totals				0	0	0	0

*State basis used for percetages used in schedule.

S-2

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) _X_ An Original (2) ___ A Resubmission	(Mo, Da, Yr) Date report compil	Fiscal Year End Date

SEWER OPERATION & MAINTENANCE EXPENSE

N/A

Acct No.	Description (a)	Amount (b)
701	Salaries & Wages - Employees	-
703	Salaries & Wages - Officers, Directors & Stockholders	-
704	Employee Pensions & Benefits	-
710	Purchased Sewage Treatment	-
711	Sludge Removal Expense	-
715	Purchased Power	-
716	Fuel for Power Production	2,625
718	Chemicals	-
720	Materials & Supplies	-
730	Contractual Services	-
740	Rents	6,450
750	Transportation Expense	-
755	Insurance Expense	-
765	Regulatory Commission Expense	-
770	Bad Debt Expense	505
775	Miscellaneous Expenses	-
	Total Sewer Operation & Maintenance Expense	6,431 16,011

SEWER CUSTOMERS

Description (a)	Customers First of Year (b)	Additions (c)	Disconnections (d)	Customers End of Year (e)
Metered Customers:				
5/8 Inch	-	-	-	-
3/4 Inch	-	-	-	-
1.0 Inch	-	-	-	-
1.5 Inch	-	-	-	-
2.0 Inch	-	-	-	-
2.5 Inch	-	-	-	-
3.0 Inch	-	-	-	-
4.0 Inch	-	-	-	-
6.0 Inch	-	-	-	-
8.0 Inch	-	-	-	-
Other (Please Specify)	-	-	-	-
Other (Please Specify)	-	-	-	-
Other (Please Specify)	-	-	-	-
Unmetered Customers	-	-	-	-
Total Customers	0	0	0	0

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) X An Original (2) A Resubmission	(Mo, Da, Yr) Date report compil	Fiscal Year Lnd Date

PUMPING EQUIPMENT

Description*** (a)	Lift Station #1 (b)	Lift Station #2 (c)	Lift Station #3 (d)	Lift Station #4 (e)
Make, Model, or Type of Pump				
Year Installed				
Rated Capacity (GPM)				
Size (HP)				
Power (Electric Mechanical)				
Make, Model or Type of Motor				

SERVICE CONNECTIONS

Description*** (a)	Service Connection #1 (b)	Service Connection #2 (c)	Service Connection #3 (d)	Service Connection #4 (e)
Size (Inches)				
Type (PVC, VCP, etc)				
Average Length (Feet)				
Connections-Beginning of Year	-	-	-	-
Connections-Added during Year	-	-	-	-
Connection-Retired during Year	-	-	-	-
Connections-End of Year	0	0	0	0
Number of Inactive Connections	-	-	-	-

COLLECTING MAINS, FORCE MAINS, & MANHOLES

Description (a)	Collecting Mains (b)	Force Mains (c)	Manholes (d)
Size (Inches)			
Type			
Length/Number Beginning of Year	-	-	-
Length Number-Added During Year	-	-	-
Length Number-Retired During Year	-	-	-
Length Number-End of Year	0	0	0

***If more space is needed to list equipment please attach additional sheets as necessary.

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) X An Original (2) A Resubmission	(Mo, Da, Yr) Date report compil	Fiscal Year End Date

TREATMENT PLANT

Description*** (a)	Treatment Facility #1 (b)	Treatment Facility #2 (c)	Treatment Facility #3 (d)	Treatment Facility #4 (e)
Manufacturer				
Type				
Steel or Concrete				
Total Capacity				
Average Daily Flow				
Effluent Disposal				
Total Gallons of Sewage Treated				

MASTER LIFT STATION PUMPS

Description*** (a)	Master Pump #1 (b)	Master Pump #2 (c)	Master Pump #3 (d)	Master Pump #4 (e)
Manufacturer				
Capacity (GPM)				
Size (HP)				
Power (Electric/Mechanical)				
Make, Model, or Type of Motor				

OTHER SEWER SYSTEM INFORMATION

Present Number of Equivalent Residential Customer's * being served	
Maximum Number of Equivalent Residential Customer's * that the system can efficiently serve	
Estimated Annual Increase in Equivalent Residential Customers *	

* Equivalent Residential Customers = (Total Gallons Treated / 365 Days) / 275 Gallons Per Day.
Total Gallons Treated includes both sewage treated and purchased sewage treatment.

State any plans and estimated completion dates for any enlargements of this system:

If the present systems do not meet environmental requirements, please submit the following:

A. An evaluation of the present plant or plants in regard to meeting the requirements.

B. Plans for funding and construction of the required upgrading.

C. The date construction will begin.

What is the percent of the certificated area that have service connections installed?

***If more space is needed to list equipment please attach additional sheets as necessary.

Name of Respondent	This Report is:	Date of Report	Year of Report
Your Company Name	(1) X An Original	(Mo, Da, Yr)	
	(2) A Resubmission	Date report comp	Fiscal Year End Date

SUPPLEMENTAL FINANCIAL DATA TO THE ANNUAL REPORT

Rate Base

Additions:	
Plant In Service	
Construction Work in Progress	
Property Held For Future Use	
Materials & Supplies	
Working Capital Allowance	
Other Additions - Common Plant Alloc from Parent Company	
Other Additions (Please Specify)	
Total Additions to Rate Base	0
Deductions:	
Accumulated Depreciation	
Accumulated Deferred Income Taxes	
Pre 1971 Unamortized Investment Tax Credit	
Customer Deposits	
Contributions in Aid of Construction	
Other Deductions (Please Specify)	
Other Deductions (Please Specify)	
Total Deductions to Rate Base	0
Rate Base	0

Adjusted Net Operating Income

Operating Revenues:	
Residential	
Commercial	
Industrial	
Public Authorities	
Multiple Family	
Fire Protection	
All Other	
Total Operating Revenues	0
Operating Expenses:	
Operation	
Depreciation	
Amortization	
Taxes Other Than Income Taxes	
Income Taxes	
Total Operating Expense	0
Net Operating Income	0
Other (Please Specify)	
Other (Please Specify)	
Adjusted Net Operating Income	0
Rate of Return (Line 49 / Line 25)	0.00%

All amounts should be calculated in a manner consistent with the last Rate Order issued by the Commission for this Company.

Secretary of State
Division of Business Services
312 Eighth Avenue North
6th Floor, William R. Snodgrass Tower
Nashville, Tennessee 37243

DATE: 10/27/08
REQUEST NUMBER: 6392-1554
TELEPHONE CONTACT: (615) 741-2286
FILE DATE/TIME: 10/24/08 1251
EFFECTIVE DATE/TIME: 10/24/08 1251
CONTROL NUMBER: 0589191

TO:
AQUA GREEN UTILITY, INC.
3325 BUCKHORN ROAD

SEVIERVILLE, TN 37864

RE:
AQUA GREEN UTILITY, INC.
CHARTER - FOR PROFIT

CONGRATULATIONS UPON THE INCORPORATION OF THE ABOVE ENTITY IN THE STATE OF TENNESSEE, WHICH IS EFFECTIVE AS INDICATED.

A CORPORATION ANNUAL REPORT MUST BE FILED WITH THE SECRETARY OF STATE ON OR BEFORE THE FIRST DAY OF THE FOURTH MONTH FOLLOWING THE CLOSE OF THE CORPORATION'S FISCAL YEAR. ONCE THE FISCAL YEAR HAS BEEN ESTABLISHED, PLEASE PROVIDE THIS OFFICE WITH THE WRITTEN NOTIFICATION. THIS OFFICE WILL MAIL THE REPORT DURING THE LAST MONTH OF SAID FISCAL YEAR TO THE CORPORATION AT THE ADDRESS OF ITS PRINCIPAL OFFICE OR TO A MAILING ADDRESS PROVIDED TO THIS OFFICE IN WRITING. FAILURE TO FILE THIS REPORT OR TO MAINTAIN A REGISTERED AGENT AND OFFICE WILL SUBJECT THE CORPORATION TO ADMINISTRATIVE DISSOLUTION.

WHEN CORRESPONDING WITH THIS OFFICE OR SUBMITTING DOCUMENTS FOR FILING, PLEASE REFER TO THE CORPORATION CONTROL NUMBER GIVEN ABOVE. PLEASE BE ADVISED THAT THIS DOCUMENT MUST ALSO BE FILED IN THE OFFICE OF THE REGISTER OF DEEDS IN THE COUNTY WHEREIN A CORPORATION HAS ITS PRINCIPAL OFFICE IF SUCH PRINCIPAL OFFICE IS IN TENNESSEE.

FOR: CHARTER - FOR PROFIT

ON DATE: 10/24/08

FROM:
ACCOUNTING & TAX SPECIALISTS
315 W. PONCE DE LEON
AVE. STE-810
DECATUR, GA 30030-0000

	FEES	
RECEIVED:	$100.00	$0.00
TOTAL PAYMENT RECEIVED:		$100.00

RECEIPT NUMBER: 00004490439
ACCOUNT NUMBER: 00580583

SS-4458

Riley C. Darnell

RILEY C. DARNELL
SECRETARY OF STATE

FRANK C. HERNDON, JEFFERSON COUNTY CLERK

LICENSE
0534156

STANDARD BUSINESS TAX LICENSE

wk04 Drawer: 12 Site: 1
Work Date: 04/13/2018

DETACH THIS PORTION FOR CONFIDENTIAL FILE

FRANK C. HERNDON
JEFFERSON COUNTY CLERK

PO BOX 710
DANDRIDGE, TN 37725

LICENSE
0534156

STANDARD BUSINESS TAX LICENSE

Mailing

6277 ADVANCED SEPTIC INC.

3350 GALTS RD
ACWORTH, GA 30102

Location

ADVANCED SEPTIC INC.

3350 GALTS RD
ACWORTH, GA 30102

DART KENDALL

LOCAL ACCOUNT NUMBER	6277
STATE ACCOUNT NUMBER	170864203
TRANSACTION NUMBER	
CLASS	04
SALES TAX NUMBER	

ISSUE DATE	04/13/18
TAX PERIOD	1/1/2017 - 12/31/2017
PAYMENT DUE BY	4/15/2019
EXPIRATION DATE	05/15/2019

Frank C Herndon

CLERK SIGNATURE

wk04 Drawer:12 Site:1

TO AVOID PENALTY, INTEREST, AND POTENTIAL ENFORCED COLLECTION ACTION, *BUSINESS TAX RETURNS AND PAYMENTS MUST BE REMITTED TO* THE TENNESSEE DEPARTMENT OF REVENUE AT LEAST 30 DAYS PRIOR TO THE EXPIRATION DATE OF THIS LICENSE.

IF PAID BY CHECK, THIS LICENSE VALID ONLY AFTER CHECK IS PAID.

THIS LICENSE DOES NOT PERMIT OPERATION UNLESS PROPERLY ZONED, AND/OR IN COMPLIANCE WITH ALL OTHER APPLICABLE LAWS/RULES.

-- POST AT LOCATION OF BUSINESS --
IF BUSINESS CLOSES, MOVES, OR CHANGES OWNERS, NOTIFY THIS OFFICE

excavateTN

3542 Jim Warren Road
Spring Hill, TN 37174

October 4, 2018

To whom it may concern:

This letter serves as confirmation that Excavate TN, LLC (Developer) has engaged Aqua Green Utility, Inc. (Utility) to provide sewer service to Flat Creek Development, roughly located south of Joe Brown Road and north of Tobe Robertson Road in Maury County, Tennessee.

Should you have further questions, please feel free to contract me at the number below.

Best regards,

Justin Hicks

President

Excavate TN, LLC

(615) 260-5523

Maury County Board of Public Utilities

Maury County Water System
Post Office Box 1196
Columbia, Tennessee 38402-1196
Office 931-375-1159 FAX 931-375-1174

September 24, 2018

Dart Kendall, President
Aqua Green Utility, Inc.
3350 Galts Rd.
Acworth, GA 30102

RE: Property Tax Map 48
Parcel 19.00
Flat Creek Subdivision

Mr. Kendall:

Maury County Board of Public Utilities has the authority to provide sewer service in Maury County. The statute creating the Board of Public Utilities does not grant Maury County Water System exclusive rights to the service area.

Therefore, Maury County Water System has no objections to a private sewer system should the Tennessee Public Service Commission (TPSC) grant a certificate of public convenience and necessity to provide sewer service to a subdivision.

Sincerely,

Larry Chunn

Larry Chunn
Superintendent
Maury County Water System
931-381-8900

MCWS is an equal opportunity provider and employer

After Recording Return To:
Aqua Green Utility Inc.
3350 Galts Rd
Acworth, Georgia 30102
Attn: Dart Kendall

(For Recording Purposes)

NON EXCLUSIVE GRANT OF EASEMENT

State of Tennessee
County of Maury

PROJECT NAME: Flat Creek

This Easement Agreement is made and entered into this 24 day of Sept 20 18, by and between _____ hereinafter referred to as "Grantor(s)," and **Aqua Green Utility Inc**, a TPUC regulated Utility of the State of Tennessee, as party of the second part hereinafter referred to as "Grantee" (the term "Grantee" to include respective heirs, beneficiaries, legal representatives, employees, contractors, agents, tenants and subtenants, successors and assigns, where the context hereof requires or permits):

WITNESSETH

That Grantor(s) for and in consideration of the sum of Ten Dollars ($10.00) and other good and valuable consideration the receipt and sufficiency of which are hereby acknowledged, does hereby grant, bargain, sell, and convey unto Grantee, a perpetual easement over and under Grantor's(s') property being more particularly described as follows:

> All that tract or parcel of land lying and being all roads, shoulder, or right of way and all other easements, in the entire community known as Flat Creek and being improved property attached hereto as Exhibit "A" which shows this easement and which is made a part hereof by reference.

The sewer easement conveyed by this instrument is and includes the permission from Grantor(s) to use up to 20 feet in width for the construction and installation of the water/sewer Mains to be situated within the said easement.

This grant of easement shall include the right of ingress to and egress from the strip over and across the real property by means of roads and lanes on such property, if such exist, otherwise by such routes or routes as shall occasion the least practical damage and inconvenience to grantor. Grantee shall have the right of grading, improving and maintaining all such roads, including bridges, on or across the real property as grantee may deem necessary in the exercise of the right of ingress and egress or provide access to the subject real property.

The sewer easement conveyed herein by Grantor(s) is for the purpose of a sewer system and includes the rights to enter upon Grantor's(s') property to install and repair sewer lines and needed street repairs to be situated within the said easement, and to inspect, maintain, replace, or repair the same, as may from time to time be necessary, or whenever Grantee deems fit, with all rights, members and appurtenances to said easement and right-of-way in anywise appertaining or belonging thereto.

Grantor(s) for both itself and its heirs and assigns understands and agrees in connection with this conveyance that any and all construction, digging, grubbing, clearing, filling or other earth moving or construction activities within or in the easement area conveyed herein are specifically in violation of the rights conveyed herein and are, therefore, prohibited without 3 days notice so the utility may locate pipes and service disruption may be avoided.

Grantor(s) hereby covenants with Grantee that it is lawfully seized and possessed of the real estate previously described herein and that it has good and lawful right to convey the easement covered by this document, or any part thereof, and that the said easement is free from all encumbrances. The easement herein granted shall bind the heirs and assigns of Grantor(s) and shall inure to the benefit of the successors in title of Grantee.

Additional Stipulations:
Grantor(s) for both itself and its heirs and assigns understands and agrees in connection with this conveyance that any and all property used for Utility purposes is exempt from any covenants and or restrictions and is not subject to any HOA, club or any other such fees.

Witness my hand and seal, this 24 day of September, 20 18.

Witness (Signature)

Ann Jett
Witness (Printed Name)

Sworn to and subscribed before me this
24 day of September, 20 18.

NOTARY PUBLIC

(SEAL)

ERIN A. BROWN
STATE OF TENNESSEE NOTARY PUBLIC
WILLIAMSON COUNTY

8/7/22

GRANTOR(S):

Insert Property Owner's Name

Insert Property Owner's Name

****Attached "8 ½ x 11" Plat – Exhibit "A"****

Exhibit "A"

LOT TABLE	
15	RESIDENTIAL LOTS (1 ACRE)
108	COMMERCIAL LOTS (1 ACRE OR LARGER)
123	TOTAL LOTS

OWNER OF RECORD
?
DEED BK. XXXX PG. XXX, MAP XXX PARCEL XX

APPLICANT
T-SQUARE ENGINEERING
701 WEST MAIN ST
FRANKLIN, TN 37064
615.678.8212

REVISIONS			
NO.	DATE		

DATE: 7-11-2018
SCALE:
DRAWN BY: T-SQUARE
REVIEWED: TET

3465 LEWISBURG PIKE
COLUMBIA TN 38401
MAURY COUNTY, TENNESSEE

3503 LEWISBURG PIKE

T-SQUARE ENGINEERING
701 WEST MAIN STREET • FRANKLIN, TN • 615-678-8212 • WWW.T2-ENG.COM

PROJECT
18-0130

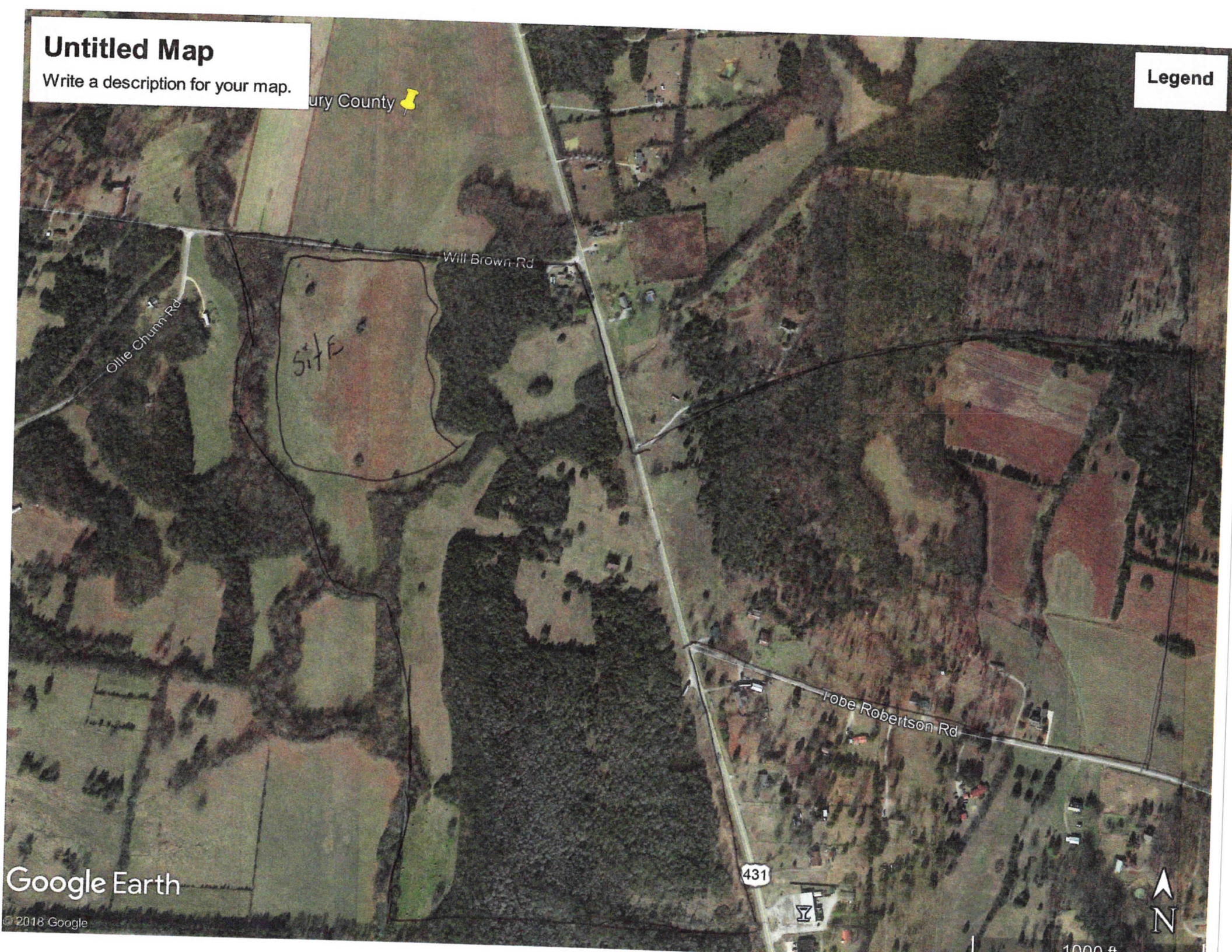
SHEET
C-1.0

Google Maps

Imagery ©2018 Google, Map data ©2018 Google 500 ft

Home

Set a work address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Serial No. 7405

State of Tennessee

Department of Environment and Conservation

Water and Wastewater Operator Certification Board

Issues This

Certificate of Competency

as Testimony That

Dart A. Kendall

has satisfactorily fulfilled the requirements set forth by the

Water and Wastewater Operator Certification Board

and is therefore, by these presents, entitled to recognition as a

Biological/Natural Operator

In Witness Whereof, we have subscribed our names and affixed our Seal

Certificate No. ********* *Dated* May 07, 2009

Recommended Gene Casto
Board Chairman

Approved _____ *Commissioner.*

Attest _____
Board Secretary

CN-0756

RDA 2404

Serial No. 8320

State of Tennessee

Department of Environment and Conservation

Water and Wastewater Operator Certification Board

Issues This

Certificate of Competency

as Testimony That

Dart A. Kendall

has satisfactorily fulfilled the requirements set forth by the

Water and Wastewater Operator Certification Board

and is therefore, by these presents, entitled to recognition as a

Grade I Wastewater Collection System Operator

In Witness Whereof, we have subscribed our names and affixed our Seal

Certificate No. 3546 *Dated* 5/5/2011

Recommended Darryl Green
Board Chairman

Approved Robert Martineau *Commissioner.*

Attest Deborah H. Smith
Board Secretary

CN-0756

RDA 2404

Subject: SOP-18027 Aqua Green Utility, Inc.; SOP notification
From: Elizabeth Rorie <Elizabeth.Rorie@tn.gov>
Date: 10/16/2018 4:52 PM
To: "dart@aquagreenutility.com" <dart@aquagreenutility.com>
CC: Allen Rather <Allen.Rather@tn.gov>, Wade Murphy <Wade.Murphy@tn.gov>, Sherry Glass <Sherry.Glass@tn.gov>

All,
This email is to acknowledge the receipt of an SOP application. Check#: 1255 / Check Amount: $500. This email is a notification of receipt only and does not confirm or imply an authorization to operate. This document has been uploaded to Waterlog. Correspondence received by TDEC becomes part of the public record and can be viewed here: Water Resources Permits Dataviewer.

Bill of Rights for Permit Applicants (TCA §69-3-141)

You will be notified regarding the completeness of your application by the permit writer assigned to your application within 30 days of its submittal. However, if your application is a Notice of Intent (NOI) to be covered under one of our general permits, if the application is deemed to be complete, separate notification about the completeness of the application will not be made. The Notice of Coverage (NOC) will simply be issued within 30 days.

Permit applicants shall have the right to know who will be reviewing their application and the time required to complete the full review process. Therefore, once applications are deemed complete, new or modified permits are to be issued or denied within 365 days, while reissuances are to be issued or denied within 180 days, with an additional 90 days granted by request. Please consider saving a copy of this email for your records.

TN Department of Environment & Conservation

Beth Rorie | Secretary
Division of Water Resources, Permits
Tennessee Tower, 11th Floor
312 Rosa L. Parks Ave.
Nashville, TN 37243
p. 615-532-1172
elizabeth.rorie@tn.gov

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
(615) 532-0625

RECEIVED
OCT 0 9 2018
ENVIRONMENTAL FIELD OFFICE
COLUMBIA

APPLICATION FOR A STATE OPERATION PERMIT (SOP)

Type of application: ☒ New Permit ☐ Permit Reissuance ☐ Permit Modification

Permittee Identification: (Name of city, town, industry, corporation, individual, etc., applying, according to the provisions of Tennessee Code Annotated Section 69-3-108 and Regulations of the Tennessee Water Quality Control Board.)
Permittee Name (applicant): Aqua Green Utility Inc.
Permittee Address: 3350 Galts Rd Acworth, GA 30102

Official Contact: Dart Kendall	Title or Position: President		
Mailing Address: 3350 Galts Rd	City: Acworth	State: GA	Zip: 30102
Phone number(s): 865-908-0432 404-557-3170	E-mail: dart@aquagreenutility.com		

Optional Contact:	Title or Position:		
Address:	City:	State:	Zip:
Phone number(s):	E-mail:		

Application Certification (must be signed in accordance with the requirements of Rule 0400-40-05-.05)		
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury		
Name and title; print or type	Signature	Date
Dart Kendall		9/28/2018

TN DEPT. OF ENV. & CONSERVATION
OCT 15 2018
DIVISION OF WATER RESOURCES

Permit Number: SOP-_____

Facility Identification:	**Existing Permit No.**
Facility Name: Flat Creek	County: Maury
Facility Address or Location: Will Brown Rd	Latitude: 35° 41' 46.31" N
	Longitude: 86° 50' 13.21" W

Name and distance to nearest receiving waters: Flat Creek 300'

If any other State or Federal Water/Wastewater Permits have been obtained for this site, list their permit numbers:
N/A

Name of company or governmental entity that will operate the permitted system: Aqua Green Utility

Operator address: 3350 Galts Rd, Acworth, GA 30102

Has the owner/operator filed for a Certificate of Convenience & Necessity (CCN), or an amended CCN, with the Tennessee Regulatory Authority (TRA) (may be required for collection systems and land application treatment systems)? ☐ Yes ☐ No ☒ N/A
If the applicant listed above does not own the facility/site or if the applicant will not be the operator, explain how and when the ownership will be transferred or describe the contractual arrangement and renewal terms of the contract for operations. land ownership will be transferred after SOP issued and before construction begins per contract

Complete the following information explaining the entity type, number of design units, and daily design wastewater flow:

Entity Type	Number of Design Units		Flow (gpd)
☐ City, town or county	No. of connections:		
☒ Subdivision	No. of homes: 108	Avg. No. bedrooms per home: 3	300
☐ School	No. of students:	Size of cafeteria(s): No. of showers:	
☐ Apartment	No. of units:	No. units with Washer/Dryer hookups: No. units without W/D hookups:	
☒ Commercial Business	No. of employees:	Type of business: 15 lots office	240
☐ Industry	No. of employees:	Product(s) manufactured:	
☐ Resort	No. of units:		
☐ Camp	No. of hookups:		
☐ RV Park	No. of hookups:	No. of dump stations:	
☐ Car Wash	No. of bays:		
☐ Other			

Describe the type and frequency of activities that result in wastewater generation.
Residental homes & office type commercial wastewater
Utility will limit commerical with individual contract agreements

Number/hp of lift stations: 2 / 1hp	Number/hp of lift pumps 4 / 1hp
Number/volume of flow pressure and or grinder pump tanks: N/A	

Permit Number: SOP-_____

Engineering Report (required for collection systems and/or land application treatment systems):	☐ N/A
☒ Prepared in accordance with Rule 0400-40-05-.03 and Section 1.2 of the State of Tennessee Design Criteria for Sewage Works (see website for more information) ☒ Attached, or ☐ Previously submitted and entitled: Approved? ☐ Yes. Date: ☐ No Operation and Maintenance Inspection Schedule Submitted: Approved? ☐ Yes. Date: ☐ No	
Wastewater Collection System: Designed & Built by others	☐ N/A
System type (i.e., gravity, low pressure, vacuum, combination, etc.): Combination STEG gravity & STEP to treatment plant	
System Description: PVC Pressure & Gravity Pipes to treatment plant	
Describe methods to prevent and respond to any bypass of treatment or discharges (i.e., power failures, equipment failures, heavy rains, etc.): PLC has redundant features for all pumping And a LP Generator for backup	
In the event of a system failure describe means of operator notification: text & email	
List the **emergency** contact(s) (name/phone): Dart Kendall 865-908-0432 404-557-3170	
For low-pressure systems, who is responsible for maintenance of STEP/STEG tanks and pumps or grinder pumps (list all contact information)? Aqua Green Utility 865-908-0432	
Approximate length of sewer (excluding private service lateral): Approx 15,000	
Number/hp of lift stations: 2 / 1hp Number/hp of lift pumps 4 / 1hp	
Number/volume of low pressure and or grinder pump tanks 4 / 0 Number/volume septic tanks 123 / 1000	
Attach a schematic of the collection system. ☐ Attached To be completed by others	
If this is a satellite sewer and you are tying in to another sewer system complete the following section, listing tie-in points to the sewer system and their location (attach additional sheets as necessary):	

Tie-in Point	Latitude (xx.xxxx°)	Longitude (xx.xxxx°)
N/A		

Permit Number: SOP-_____

Land Application Treatment System:	☐ N/A
Type of Land Application Treatment System: ☒ Drip ☐ Spray ☐ Other, explain:	
Type of treatment facility preceding land application (recirculating media filters, lagoons, other, etc.): Trickle filter with synthetic media	
Attach a treatment schematic. ☐ Attached	
Describe methods to prevent and respond to any bypass of treatment or discharges (i.e., power failures, equipment failures, heavy rains, etc.): All pump duplex - LP Generator - PLC will Email & text any problems	
For New or Modified Projects: Name of Developer for the project: Justin Hicks Developer address and phone number: 1725 South Rutherford Blvd, Murfreesboro TN 37130 615-585-0833	
For land application, list: Proposed acreage involved: 3.44 Inches/week gpd/sq.ft loading rate to be applied: .24 loading Rate	
Is wastewater disinfection proposed? No	
☐ Yes Describe land application area access: Adjoins Will Brown Rd ☐ No Describe how access to the land application area will be restricted: Fencing	

Attach required additional Engineering Report Information (see website for more information)

☐ Topographic map (1:24,000 scale presented at a six inch by six inch minimum size) showing the location of the project including quadrangle(s) name(s) GPS coordinates, and latitude and longitude in decimal degrees should also be included.

☒ Scaled layout of facility showing the following: lots, buildings, etc. being served, the wastewater collection system routes, the pretreatment system location, the proposed land application area(s), roads, property boundaries, and sensitive areas such as streams, lakes, springs, wells, wellhead protection areas, sinkholes and wetlands.

☒ Soils information for the proposed land disposal area in the form of a Water Resources Soils Map per Chapter 16 and 17 State of Tennessee Design Criteria for Sewage Works. The soils information should include soil depth (borings to a minimum of 4 feet or refusal) and soil profile description for each soil mapped.

☒ Topographic map of the area where the wastewater is to be land applied with no greater than ten foot contours presented at a minimum size of 24 inches by 24 inches.

☒ Describe alternative application methods based on the following priority rating: (1) connection to a municipal/public sewer system, (2) connection to a conventional subsurface disposal system as regulated by the Division of Water Resources, and/or (3) land application.

Permit Number: SOP-_____

For Drip Dispersal Systems Only: Unless otherwise determined by the Department, sewage treatment effluent wells, i.e, large capacity treatment/drip dispersal systems after approval of the SOP Application, will be issued an UIC tracking number and will be authorized as Permit by Rule per UIC Rule 0400-45-06-.14(2) and upon issue of a State Operating Permit and Sewage System Construction Approval by the Department. Describe the following:	☐ N/A
The area of review (AOR) for each Drip Dispersal System shall, unless otherwise specified by the Department, consist of the area lying within a one mile radius or an area defined by using calculations under 0400-45-06-.09 of the Drip Dispersal System site or facility, and shall include, but not be limited to general surface geographic features, general subsurface geology, and general demographic and cultural features within the area. Attach to this part of the application a general characterization of the AOR, including the following: (This can be in narrative form)	
☒ A general description of all past and present groundwater uses as well as the general groundwater flow direction and general water quality.	
☒ A general description of the population and cultural development within the AOR (i.e. agricultural, commercial, residential or mixed)	
☒ Nature of injected fluid to include physical, chemical, biological or radiological characteristics.	
☐ If groundwater is used for drinking water within the area of review, then identify and locate on a topographic map all groundwater withdrawal points within the AOR, which supply public or private drinking water systems. Or supply map showing general location of publicly supplied water for the area (this can be obtained from the water provider)	
☒ If the proposed system is located within a wellhead protection area or source water protection area designated by Rule 0400-45-01-.34, show the boundary of the protection area on the facility site plan.	
☒ Description of system, Volume of injected fluid in gallons per day based upon design flow, including any monitoring wells	
☒ Nature and type of system, including installed dimensions of wells and construction materials	

Pump and Haul:	☒ N/A
Reason system cannot be served by public sewer:	
Distance to the nearest manhole where public sewer service is available:	
When sewer service will be available:	
Volume of holding tank: gal.	
Tennessee licensed septage hauler (attach copy of agreement):	
Facility accepting the septage (attach copy of acceptance letter):	
Latitude and Longitude (in decimal degrees) of approved manhole for discharge of septage:	
Describe methods to prevent and respond to any bypass of treatment or discharges (i.e., power failures, equipment failures, heavy rains, etc.):	

Permit Number: SOP-_____

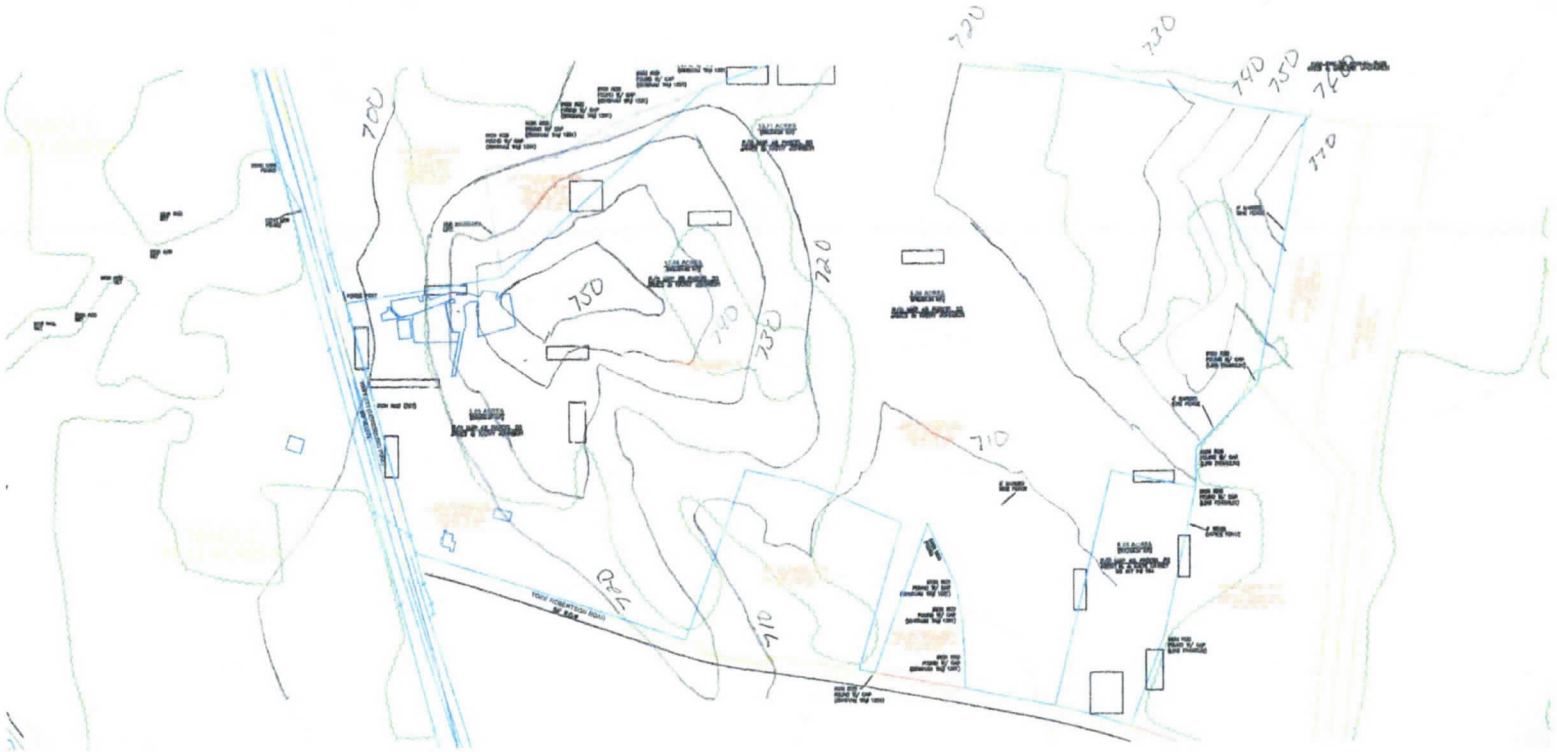
Holding Ponds (for non-domestic wastewater only):	☒ N/A
Pond use: ☐ Recirculation ☐ Sedimentation ☐ Cooling ☐ Other (describe):	
Describe pond use and operation:	
If the pond(s) are existing pond(s), what was the previous use?	
Have you prepared a plan to dispose of rainfall in excess of evaporation? ☐ Yes ☐ No	
If so, describe disposal plan:	
Is the pond ever dewatered? ☐ Yes ☐ No	
If so, describe the purpose for dewatering and procedures for disposal of wastewater and/or sludge:	
Is(are) the pond(s) aerated? ☐ Yes ☐ No	
Volume of pond(s): gal. Dimensions:	
Is the pond lined (Note if this is a new pond system it must be lined for SOP coverage. Otherwise, you must apply for an Underground Injection Control permit.)? ☐ Yes ☐ No	
Describe the liner material (if soil liner is used give the compaction specifications):	
Is there an emergency overflow structure? ☐ Yes ☐ No	
If so, provide a design drawing of structure.	
Are monitoring wells or lysimeters installed near or around the pond(s)? ☐ Yes ☐ No	
If so, provide location information and describe monitoring protocols (attach additional sheets as necessary):	

Permit Number: SOP-_____

Mobile Wash Operations:	☒ N/A
☐ Individual Operator	☐ Fleet Operation Operator
Indicate the type of equipment, vehicle, or structure to be washed during normal operations (check all that apply): ☐ Cars ☐ Trucks ☐ Trailers (Interior washing of dump-trailers, or tanks, is prohibited.) ☐ Other (describe):	☐ Parking Lot(s): sq. ft. ☐ Windows: sq. ft. ☐ Structures (describe):
Wash operations take place at (check all that apply): ☐ Car sales lot(s) ☐ Private industry lot(s) ☐ County(ies), list:	☐ Public parking lot(s) ☐ Private property(ies) ☐ Statewide
Wash equipment description: ☐ Truck mounted ☐ Rinse tank size(s) (gal.): ☐ Collection tank size(s) (gal.):	☐ Trailer mounted ☐ Mixed tanks size(s) (gal.): Number of tanks per vehicle:
Pressure washer: psi (rated) gpm (rated) ☐ gas powered ☐ electric	
Vacuum system manufacturer/model:	Vacuum system capacity: inches Hg
Describe any other method or system used to contain and collect wastewater:	
List the public sewer system where you are permitted or have written permission to discharge waste wash water (include a copy of the permit or permission letter):	
Are chemicals pre-mixed, prior to arriving at wash location? ☐ Yes ☐ No	

Describe all soaps, detergents, or other chemicals used in the wash operation (attach additional sheets as necessary):

Chemical name:	Manufacturer:	Primary CAS No. or Product No.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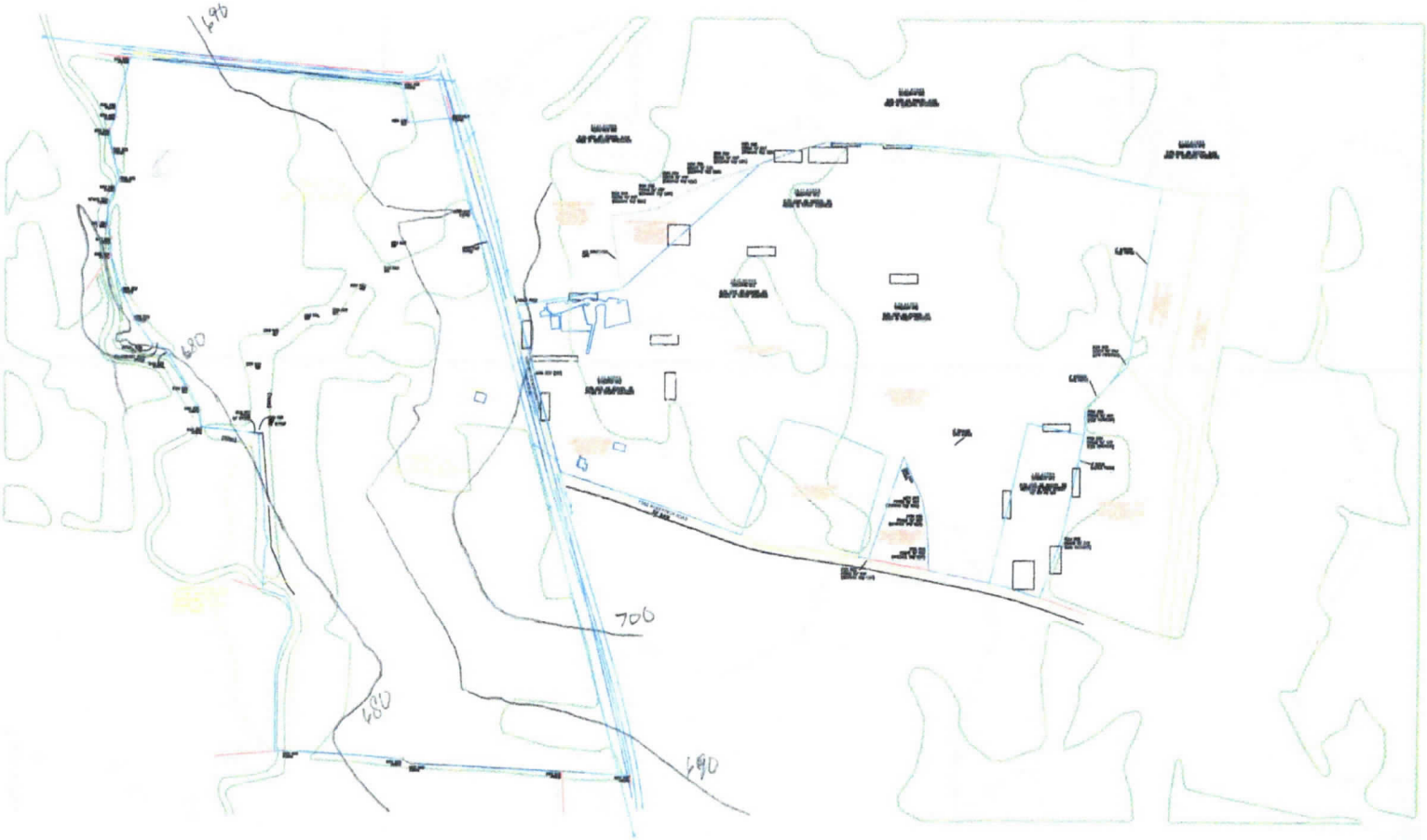
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AquaGreen
Utility Inc.

3350 Galts Road . Acworth, Georgia . 30102

AOR Drip Dispersal System for the Maury County Flat Creek Subdivision

The groundwater has been used for dring water and irrigation in the general area. There is public water in the area. The ground water at the drip dispersal system flows toward the south and west along the natural contours of the property toward Flat Creek.

This area mostly holds a rural residental population with some light commerical along the main highways.

The Fluid to be injected will consist of treated wastewater effluent. The Effluent will have a BOD5 of less than 45.

We are unaware of any wellhead protection in the area or source water protection.

This will be a sewage treatment system system using drip irrigation at a flow capcity of 36000 gallons per day.

The injection area will have drip emitter tubeing between 6 and 10 inches bellow the surface.

Maury County water department provides water for the area.

Sincerely,

Dart Kendall
President
AquaGreen Utility Inc.

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: stream terrace

PIT #: 1

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Nesbitt Var - depth to wetness

DRAINAGE CLASS: well drained

CLASSIFICATION: fine

GROUND WATER: none

PARENT MATERIAL: alluvium over residuum

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-2				silt loam	weak and moderate	fine and medium	granular and subangular blocky	
Ap2	2-6				silt loam	moderate	medium	subangular blocky	
BA	6-11				silty clay loam	weak	medium	subangular blocky	
Bt1	11-17				silty clay loam	moderate	medium	subangular blocky	
Bt2	17-22				silty clay loam	moderate	medium	subangular blocky	
Bt3	22-28				silty clay loam	weak	medium	subangular blocky	many concretions
Bt4	28-36				silty clay	moderate	medium	subangular blocky	
Bt5	36-39				silty clay	moderate	medium	subangular blocky	
Bt6	39-44				clay	moderate	medium	subangular blocky	slight brittleness

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: stream terrace

PIT #: 2

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Holston

DRAINAGE CLASS: well drained

CLASSIFICATION: fine silty or fine loamy

GROUND WATER: none

PARENT MATERIAL: alluvium

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-7				loam	weak and moderate	fine and medium	granular and subangular blocky	
Ap2	7-12				loam	moderate	medium	subangular blocky	
Bt1	12-21				silty clay loam	moderate	medium	subangular blocky	
Bt2	21-26				silty clay loam	moderate	medium	subangular blocky	
Bt3	26-34	7.5YR 4/4	common 10YR 6/6 common 10YR 6/4		clay loam	weak	medium	subangular blocky	
Bt4	34-45	7.5YR 4/4	common 10YR 6/4 common 10YR 6/3		clay loam	weak	medium	subangular blocky	common iron masses

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: stream terrace

PIT #: 3

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Deep Nesbit/Swafford

DRAINAGE CLASS: well drained

CLASSIFICATION: fine loamy/fine silty

GROUND WATER: none

PARENT MATERIAL: alluvium over residuum

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-2				silt loam	weak and moderate	fine and medium	granular and subangular blocky	
Ap2	2-6				silt loam	moderate	medium	subangular blocky	
AB	6-11				silt loam	moderate	medium	subangular blocky	
Bt1	11-16				silty clay loam	moderate	medium	subangular blocky	
Bt2	16-20				silty clay loam	moderate	medium	subangular blocky	
Bt3	20-24				clay loam	moderate	medium	subangular blocky	
Bt4	24-31				clay loam	moderate	medium	subangular blocky	
Bt5	31-37				clay	moderate	medium	subangular blocky	
Bt6	37-45		common 7.5 YR 5/2	37	clay	weak	medium	subangular blocky	slight brittleness

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: stream terrace

PIT #: 4

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Armour/Harpeth

DRAINAGE CLASS: well drained

CLASSIFICATION: fine silty

GROUND WATER: none

PARENT MATERIAL: alluvium

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-3				loam	weak	fine	granular	
Ap2	3-7				loam	weak and moderate	fine and medium	granular and subangular blocky	
A	7-12				loam	moderate	medium	subangular blocky	
AB	12-20				silt loam	weak	medium	subangular blocky	
Bt1	20-30				silty clay loam	moderate	medium	subangular blocky	
Bt2	30-37	7.5YR 4/4	common 10YR 6/4		silty clay loam	moderate	medium	subangular blocky	
Bt3	37-44	7.5YR 5/4	common 10YR 6/4 common 10YR 6/3		silty clay loam	weak	medium	subangular blocky	

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: stream terrace

PIT #: 5

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Armour/Harpeth

DRAINAGE CLASS: well drained

CLASSIFICATION: fine silty

GROUND WATER: none

PARENT MATERIAL: alluvium

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-3				silt loam	weak	fine	granular	
Ap2	3-10				silt loam	weak and moderate	fine and medium	granular and subangular blocky	
Bt1	10-20				silty clay loam	moderate	medium	subangular blocky	
Bt2	20-25				silty clay loam	moderate	medium	subangular blocky	
Bt3	25-32				silty clay loam	moderate	medium	subangular blocky	
Bt4	32-38	7.5YR 5/6	common 10YR 6/4 common 10YR 6/3		silty clay loam	moderate	medium	subangular blocky	
Bt5	38-45	7.5YR 5/6	common 10YR 6/4		silty clay	weak	medium	subangular blocky	

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: floodplain

PIT #: 6

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Swafford Overwash

DRAINAGE CLASS: well drained

CLASSIFICATION: fine loamy

GROUND WATER: none

PARENT MATERIAL: alluvium

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT: 0-2%

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-3				silt loam	weak and moderate	fine and medium	granular and subangular blocky	
Ap2	3-9				silt loam	moderate	medium	subangular blocky	
Ab	9-29				silt loam	moderate	medium	subangular blocky	
Btb1	29-34				silty clay loam	weak	medium	subangular blocky	
Btb2	34-39		few 10YR 5/3		clay loam	moderate	medium	subangular blocky	
Btb3	39-47		common 10YR 5/3		clay loam	moderate	medium	subangular blocky	common iron masses and nodules

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: floodplain/stream terrace

PIT #: 7

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Capshaw Overwash

DRAINAGE CLASS: moderately well drained

CLASSIFICATION: fine

GROUND WATER: none

PARENT MATERIAL: alluvium

LAND COVER: mixed grasses

CLIMATE: thermic

SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-3				silt loam	weak	fine	granular	
Ap2	3-12				silt loam	moderate	medium	subangular blocky	
Ab	12-18				silty clay loam	moderate	medium	subangular blocky	
ABb	18-22				silty clay loam	moderate	medium	subangular blocky	
Btb1	22-27				silty clay	weak	medium	subangular blocky	
Btb2	27-30	10YR 5/3, 4/3 and 5/6			silty clay	weak	medium	subangular blocky	
Btb3	30-37	10YR 6/3, 5/3 4/3 and 5/6			silty clay	weak	medium	subangular blocky	
C	37-43	10YR 4/3, 5/6 and 6/2		37	clay	stuctureless		massive	

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

SITE LOCATION: Hicks Property

PIT #: 8

SOIL SERIES: Holston

CLASSIFICATION: fine loamy

PARENT MATERIAL: alluvium

CLIMATE: thermic

SLOPE OF MAP UNIT: 0-10%

DATE: 6/6/2018

GEOMORPHIC DESCRIPTION: terrace

PHYSIOGRAPHIC LOCATION: Nashville Basin

DRAINAGE CLASS: well drained

GROUND WATER: none

LAND COVER: mixed grasses

SLOPE OF PIT:

EROSION: none to slight

ADDITIONAL NOTES:

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-4				loam	weak	fine	granular	
Ap2	4-10				loam	moderate	medium	subangular blocky	
BA	10-16				loam	moderate	medium	subangular blocky	
Bt1	16-22				clay loam	moderate	medium	subangular blocky	
Bt2	22-31				clay loam	moderate	medium	subangular blocky	
Bt3	31-39				clay loam	moderate	medium	subangular blocky	
Bt4	39-46				clay loam	moderate	medium	subangular blocky	

SOIL PEDON DESCRIPTION:

DESCRIBED BY: Lonnie Norrod

DATE: 6/6/2018

SITE LOCATION: Hicks Property

GEOMORPHIC DESCRIPTION: terrace

PIT #: 9

PHYSIOGRAPHIC LOCATION: Nashville Basin

SOIL SERIES: Sykes

DRAINAGE CLASS: well drained

CLASSIFICATION: fine silty

GROUND WATER: none

PARENT MATERIAL: alluvium over residuum

LAND COVER: mixed grasses

CLIMATE: thermic

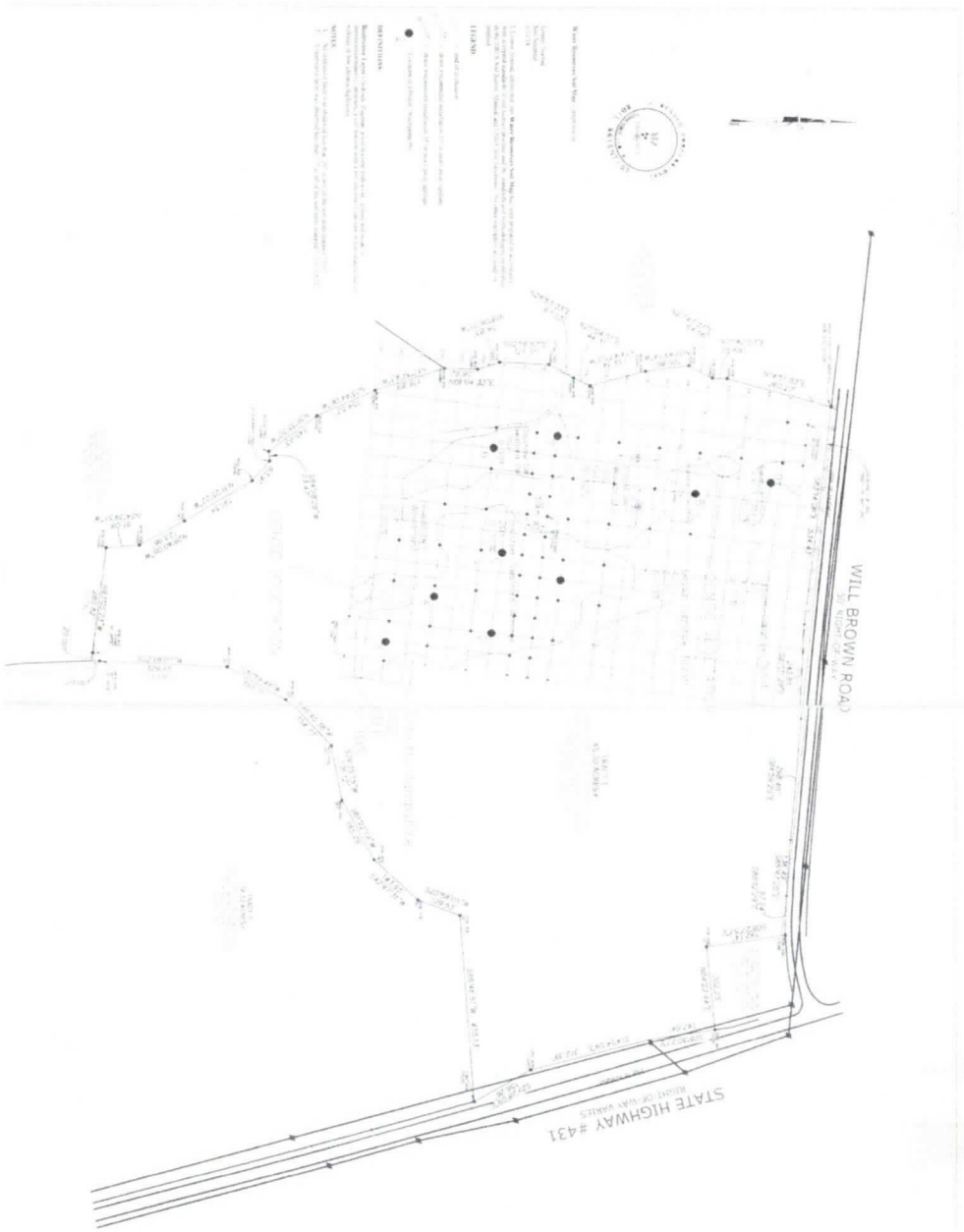
SLOPE OF PIT:

SLOPE OF MAP UNIT: 0-10%

EROSION: none to slight

ADDITIONAL NOTES: floater rock in pit

Horizon	Depth (inches)	Matrix Color	Depletions/Concentrations/Redox	Depth to low chroma mottles	Soil Texture	Soil Structure			Soil Horizon Notes:
						Grade	Size	Type	
Ap1	0-4				silt loam	weak and moderate	fine and medium	granular and subangular blocky	
Ap2	4-9				silt loam	moderate	medium	subangular blocky	
Bt1	9-17				silty clay loam	moderate	medium	subangular blocky	
Bt2	17-23				silty clay loam	moderate	medium	subangular blocky	
Bt3	23-30				silty clay loam	weak	medium	subangular blocky	common iron masses and nodules
Bt4	30-36				silty clay loam	weak	medium	subangular blocky	common iron masses and nodules
Bt5	36-42				silty clay	weak	medium	subangular blocky	common iron masses and nodules



Scale : 1" = 100'

100' HIGH INTENSITY SOILS GRID MAP

THE FLAT CREEK DEVELOPMENT, LLC PROPERTY
3490 HIGHWAY 431
TAX MAP 48, PARCEL 19.02
BOOK R2482, PAGE 779 (R.O.M.C., TN)
COLUMBIA, MAURY COUNTY, TENNESSEE

H & H LAND SURVEYING, INC.

Note 1

Each home or commercial site will be required to have a separate septic tank which follow utility requirements , there will be a combination of 2 possible types of tanks at any location, STEG or STEP.

The STEG tanks will be a 1 piece concrete septic tank with 2 compartments. The 2 piece concrete tanks that have the joint in the side sealed with sealant will not be allowed. Our experience with these tanks show they tend to leak at this joint. If there is no other option, a plastic tank may be accepted. Each tank will have a sewer popper device that allows sewage to escape in case of a line failure, protecting the home from flooding. Use of 4 inch schedule 40 PVC pipe will be required. Each septic tank will have 2 Polylok risers to the surface. This allows easy access for the utility to service these tanks and prevents the homeowner from later building a structure over the tank by accident. The utility assumes all regular and emergency maintenance of these tanks. Each tank will have a septic tank filter restricting solids passage to 1/8 inch, protecting all downstream components. These tanks also serve as grease traps to protect treatment processes. Each tap will have a clean out type access point where it enters the main line. This allows line location, quick access and the ability to isolate customers disposing of anything other than domestic sewage.

The STEP type system would be used if a gravity flow from the septic tank is not practical. These systems contain all the features of the STEG tank, but with the addition of a 1 piece single chamber septic dosing tank with one Polylok riser to the surface. These tanks must also follow utility requirements which include: two pumps (Little Giant WE10G05P4-21) with 3 floats in each dosing tank with a small PLC control panel. Our experience has established that 95% of problems at each home on STEP systems will be a pump or float that is bad. Pump selection being a high head type, assures flow from any elevation in the subdivision and this is a pump that the utility already stocks. The PLC at each home alternates each pump. If after 5 hours of pumping the level in the tank has not fallen, the pump is considered bad and the second pump is turned on. A Yellow light is illuminated flashing a code that the pump is bad. A buzzer goes off asking the homeowner to call the utility for service. If the second pump does not lower the water level in the dosing tank, a second buzzer and red light lets the homeowner know that Immediate service is required. (See panel label). The PLC software has many other such redundant features to make sure each home operates.

AQUA GREEN UTILITY

Red Light - High Water Level Alarm!
If power has been out, it
may take 2 hrs for tank
to pump water down.
If alarm is still on,
call 865-908-0432 immediately.

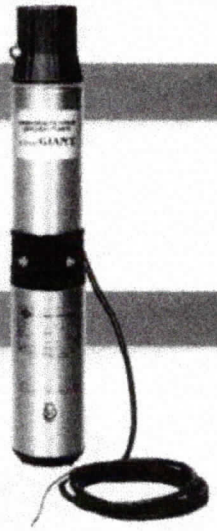
Press switch down to silence
buzzer, press switch back
up for normal operation
when red light goes off.

Yellow Light - Push button to silence.
System needs maintenance.
Please call 865-908-0432.

Green Lights - Should be on, showing that
power is on.
If not, reset your 2 circuit
breakers in your house.

EFFLUENT PUMPS

WE SERIES 1/2 HP



APPLICATIONS

- High head filter effluent • Filtered effluent service • Aeration
- Ornamental fountains • Water fountains

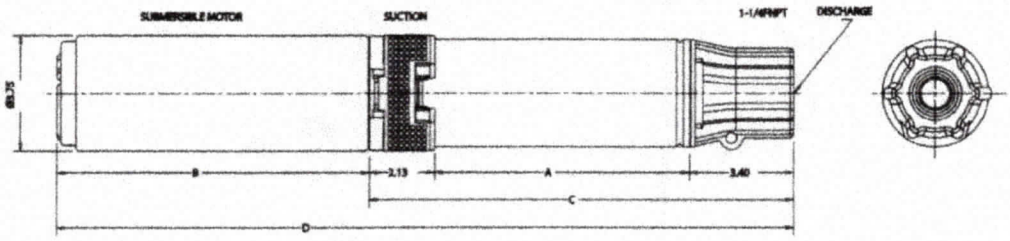
FEATURES

- Franklin Electric submersible motor
- Heavy duty, 300 V, 10' (3 m) SJOW motor stripped leads
- Removable built-in check valve
- Non-corrosive thermoplastic discharge and motor brackets
- Proven "PPO" staging allows close tolerances and increased performance
- High quality top bearing for maximum durability and years of reliable service
- Hex rubber bearing has extra-large surface for shaft stability and multiple flow channels for keeping particles away from bearing surfaces
- Stainless steel up thrust washer prevents excessive wear in service applications
- cCSAus listed

SERIES SPECIFICATIONS

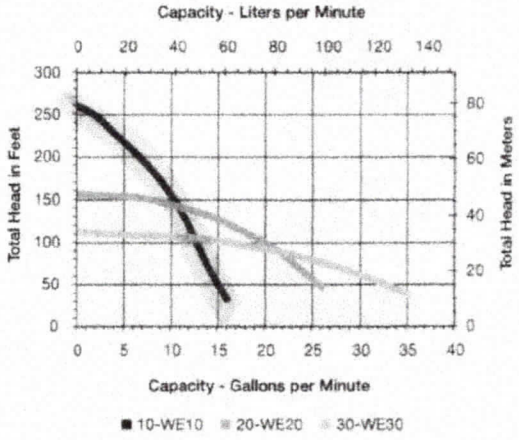
Item No	Model	HP	Volts	Hz	Amps		Watts	Wires	Well Size	Performance (GPM @ Height in Feet)				
					FLA	Start				50'	100'	150'	200'	250'
558221	WE10G05P4-21	1/2	115	60	10	64.4	670	2	4"	15	13	10	7	2
558222	WE10G05P4-22	1/2	230	60	5	23.2	670	2	4"	15	13	10	7	2
558223	WE20G05P4-21	1/2	115	60	10	64.4	670	2	4"	28	20	9	–	–
558224	WE20G05P4-22	1/2	230	60	5	23.2	670	2	4"	28	20	9	–	–
558225	WE30G05P4-21	1/2	115	60	10	64.4	670	2	4"	32	14	–	–	–
558226	WE30G05P4-22	1/2	230	60	5	23.2	670	2	4"	32	14	–	–	–

ENGINEERING DATA



Model	A	B	C	D
2-Wire 10 gpm	7" 17.78 cm	9.38" 23.83 cm	12.53" 31.83 cm	21.91" 55.65 cm
2-Wire 20 gpm	9" 22.86 cm	9.38" 23.83 cm	14.53" 36.91 cm	23.91" 60.73 cm
2-Wire 30 gpm	6.5" 16.51 cm	9.38" 23.83 cm	12.03" 30.56 cm	21.41" 54.36 cm

PERFORMANCE DATA

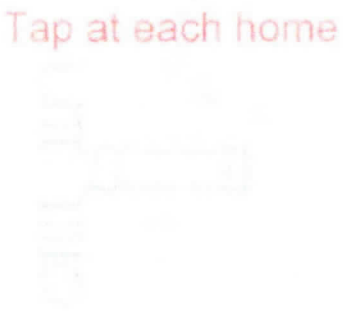


CONSTRUCTION

Motor Housing	Stainless steel
Impeller Material	Celcon
Diffuser	Glass-filled PPO
Power Cord	10' SJOW
Check Valve	Celcon
Fasteners	Stainless steel
Shaft	Stainless steel
Bearings	PEEK
Discharge	Glass-filled polypropylene

Note 2

The piping system that brings the sewage to the main plant will be installed by others, but it is required that a utility representative must inspect all components and installations. Schedule 40 PVC solid core pipe with glued type connections is required for all system components. All piping is to lay on gravel with a underground irrigation type multi wire for future locating attached. This wire will also be used by the PLC to monitor lift station effluent levels and send alarms if needed. As each pipe is buried a warning sewer line buried tape is to be install just above the sewer line. Each tap location must have a clean out port for inspection and service.



Note 3

As sewage enters the plant from the STEG gravity lines it will first flow into a 24 inch cement upright pipe. The pipe will have a 4 inch ball check valve below normal water level in the main tank allowing main tank effluent to enter the pipe whenever sewage flow is less than pump requirements.

The two alternating recirculation pumps will also be located here. The Goulds WE1032H Pump with CV-2001_H1 Variable Frequency Drive (VFD)is selected. The two recirculation pumps flow through 2" PVC schedule 40 pipe to the control room lift pump wall. If the high level float in the main dosing tank goes up, then the VFD will be turned on to full flow. If the low level float in the main dosing tank goes down, then the VFD will be turned off. If the floats are in the normal position, then the flow rate of the recirculation pumps will be controlled with a 4-20 pressure transducer just inside the control room.

(See Lift Pump Wall) The transducers are set to 6 psi then out to the trickle filter sprayers. If the solar or either lift station pumps are flowing at a higher pressure, then the VFD will turn the active recirculation pump to idle. This feature is to conserve electrical energy.

The recirculation rate will be set by two methods First is the PLC control of time on and time off for the pumps maximum time off is 5 minutes. Second is the size of wobbler spray nozzle and number of nozzles that are active. These settings are controlled by the operator to maximize efficiency and maintain effluent quality as the homes are built in the subdivision.

If flow to the trickle filter sprayers is greater than the nozzle and pump timer setting, a adjustable PRV (Pressure Relief Valve) will trip at 10 psi. This will allow flow to the high flow sprayers trickle filter. These sprayers have large openings and are set to flow about 50 gallons per minute.

The pipe from the dosing tank to the control room should be about 50 foot long 2 inch PVC. With a max flow of 70 GPM FL = 3.7 Foot of head Fifty foot of 3 inch pipe running from control room to the sprayers Fl = .54 foot of head EL from lower tank level to sprayer level equals 15' EL. Head need to flow sprayers at 6 PSI is 13.8 Total head needed at 70 GPM 33.4 This pump will provide 70 GPM at about 38 foot of head. Leaving about 4.5 foot of head for fittings etc. This pump is capable of flowing just over 100,000 gallons per day. If ever needed both pumps could be used providing over 200,000 gallons per day recirculation.

TECHNICAL BROCHURE
B3885

FEATURES

Impeller: Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

Casing: Cast iron volute type for maximum efficiency. 2" NPT discharge.

Mechanical Seal: Silicon Carbide vs. Silicon Carbide sealing faces. Stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

Fasteners: 300 series stainless steel.

Capable of running dry without damage to components.

Designed for continuous operation when fully submerged.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

WE Series

Model 3885

SUBMERSIBLE EFFLUENT PUMPS

GOULDS

a xylem brand

Wastewater

APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on ½ - 1½ HP models.
- Class F insulation on 2 HP models.

Single phase (60 Hz):

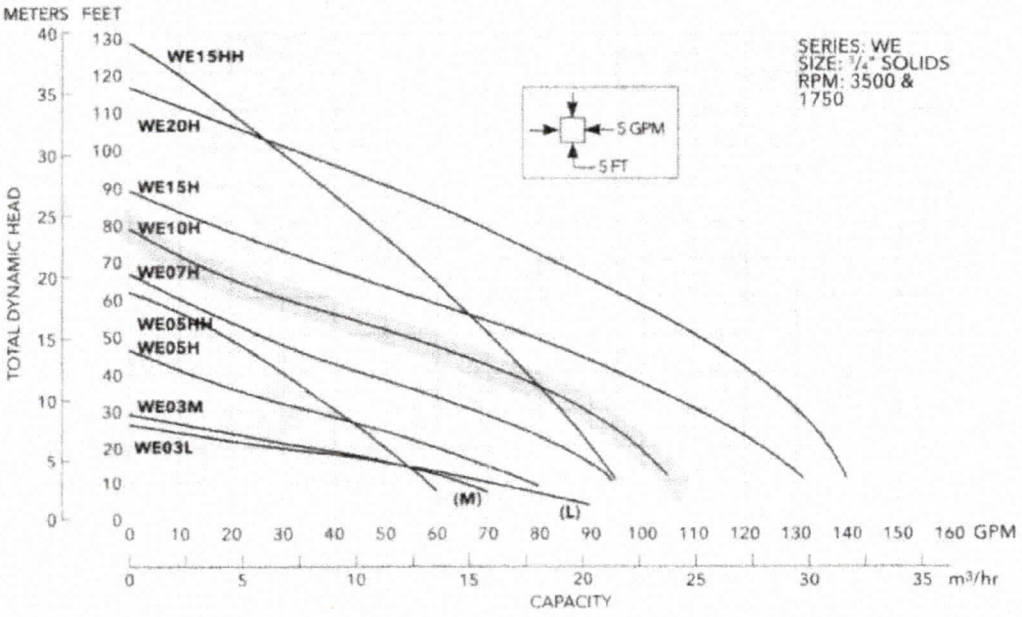
- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ½ - 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- Bearings: Upper and lower heavy duty ball bearing construction.
- Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- O-ring: Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association File #LR38549



MODELS

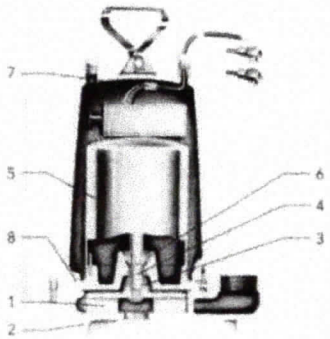
Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency %	Resistance Start	Resistance Line-Line	Power Cable Size	Weight (lbs.)
WE0311L	0.33	1	115	1750	5.38	10.7	30.0	M	54	11.9	1.7	16/3	56
WE0318L			208			6.8	19.5	K	51	9.1	4.2		
WE0312L			230			4.9	14.1	L	53	14.5	8.0		
WE0311M			115			10.7	30.0	M	54	11.9	1.7		
WE0318M			208			6.8	19.5	K	51	9.1	4.2		
WE0312M			230			4.9	14.1	L	53	14.5	8.0		
WE0511H	0.5	1	115	1750	3.56	14.5	46.0	M	54	7.5	1.0	14/3	60
WE0518H			208			8.1	31.0	K	68	9.7	2.4	16/3	60
WE0512H			230			7.3	34.5	M	53	9.6	4.0		
WE0538H		3	200			4.9	22.6	R	68	NA	3.8	14/4	60
WE0532H			230			3.3	18.8	R	70	NA	5.8		
WE0534H			460			1.7	9.4	R	70	NA	23.2		
WE0537H			575			1.4	7.5	R	62	NA	35.3		
WE0511HH		1	115		3.88	14.5	46.0	M	54	7.5	1.0	14/3	60
WE0518HH			208			8.1	31.0	K	68	9.7	2.4	16/3	60
WE0512HH			230			7.3	34.5	M	53	9.6	4.0		
WE0538HH		3	200			4.9	22.6	R	68	NA	3.8	14/4	60
WE0532HH			230			3.6	18.8	R	70	NA	5.8		
WE0534HH			460			1.8	9.4	R	70	NA	23.2		
WE0537HH			575			1.5	7.5	R	62	NA	35.3		
WE0718H	0.75	1	208	1750	4.06	11.0	31.0	K	68	9.7	2.4	14/3	70
WE0712H			230			10.0	27.5	J	65	12.2	2.7		
WE0738H		3	200			6.2	20.6	L	64	NA	5.7	14/4	70
WE0732H			230			5.4	15.7	K	68	NA	8.6		
WE0734H			460			2.7	7.9	K	68	NA	34.2		
WE0737H			575			2.2	9.9	L	78	NA	26.5		
WE1018H	1	1	208	3450	4.44	14.0	59.0	K	68	9.3	1.1	14/3	70
WE1012H			230			12.5	36.2	J	69	10.3	2.1		
WE1038H		3	200			8.1	37.6	M	77	NA	2.7	14/4	70
WE1032H			230			7.0	24.1	L	79	NA	4.1		
WE1034H			460			3.5	12.1	L	79	NA	16.2		
WE1037H			575			2.8	9.9	L	78	NA	26.5		
WE1518H	1.5	1	208		4.56	17.5	59.0	K	68	9.3	1.1	14/3	80
WE1512H			230			15.7	50.0	H	68	11.3	1.6		
WE1538H		3	200			10.6	40.6	K	79	NA	1.9	14/4	80
WE1532H			230			9.2	31.7	K	78	NA	2.9		
WE1534H			460			4.6	15.9	K	78	NA	11.4		
WE1537H			575			3.7	13.1	K	75	NA	16.9		
WE1518HH		1	208		5.50	17.5	59.0	K	68	9.3	1.1	14/3	80
WE1512HH			230			15.7	50.0	H	68	11.3	1.6		
WE1538HH		3	200			10.6	40.6	K	79	NA	1.9	14/4	80
WE1532HH			230			9.2	31.7	K	78	NA	2.9		
WE1534HH			460			4.6	15.9	K	78	NA	11.4		
WE1537HH			575			3.7	13.1	K	75	NA	16.9		
WE2012H	2	1	230		5.38	18.0	49.6	F	78	3.2	1.2	14/3	83
WE2038H		3	200			12.0	42.4	K	78	NA	1.7	14/4	83
WE2032H			230			11.6	42.4	K	78	NA	1.7		
WE2034H			460			5.8	21.2	K	78	NA	6.6		
WE2037H			575			4.7	16.3	L	78	NA	10.5		

PERFORMANCE RATINGS (gallons per minute)

Order No.		WE-03L	WE-03M	WE-05H	WE-07H	WE-10H	WE-15H	WE-05HH	WE-15HH	WE-20H
Total Head Feet of Water	HP	½	⅓	½	¾	1	1½	½	1½	2
	RPM	1750	1750	3500	3500	3500	3500	3500	3500	3500
	5	86	-	-	-	-	-	-	-	-
	10	70	63	78	94	-	-	58	95	-
	15	52	52	70	90	103	128	53	93	138
	20	27	35	60	83	98	123	49	90	136
	25	5	15	48	76	94	117	45	87	133
	30	-	-	35	67	88	110	40	83	130
	35	-	-	22	57	82	103	35	80	126
	40	-	-	-	45	74	95	30	77	121
	45	-	-	-	35	64	86	25	74	116
	50	-	-	-	25	53	77	-	70	110
	55	-	-	-	-	40	67	-	66	103
	60	-	-	-	-	30	56	-	63	96
	65	-	-	-	-	20	45	-	58	89
	70	-	-	-	-	-	35	-	55	81
	75	-	-	-	-	-	25	-	51	74
	80	-	-	-	-	-	-	-	47	66
	90	-	-	-	-	-	-	-	37	49
	100	-	-	-	-	-	-	-	28	30

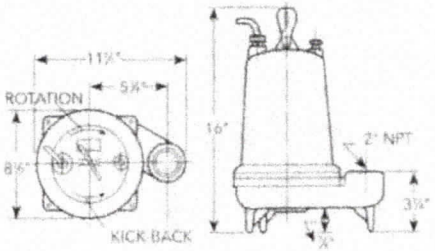
COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O Ring



DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



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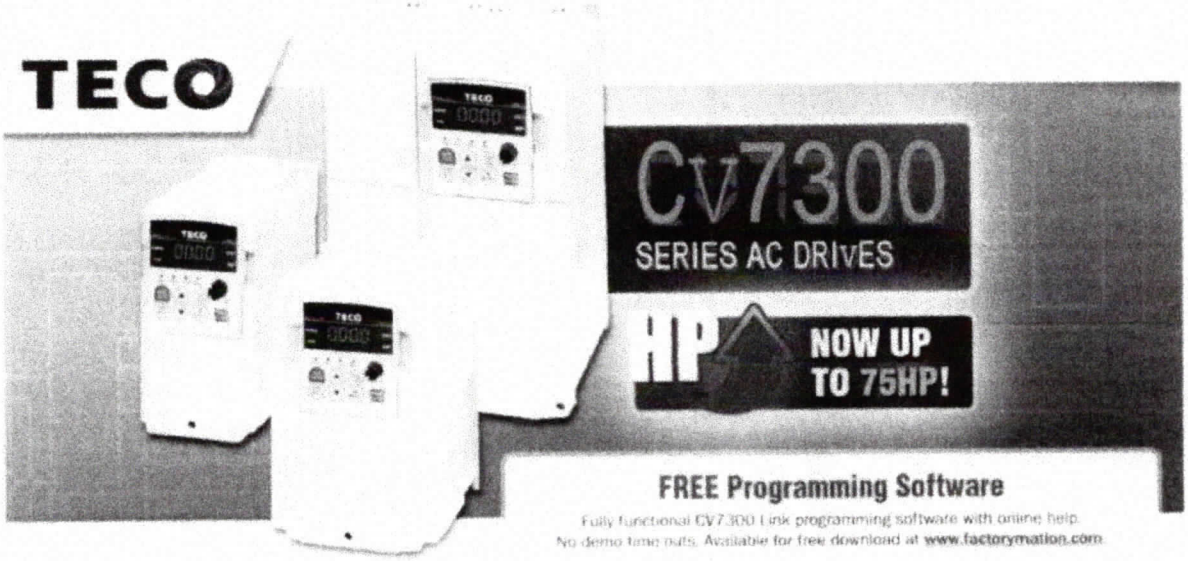

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AC DRIVE FEATURES

Features:

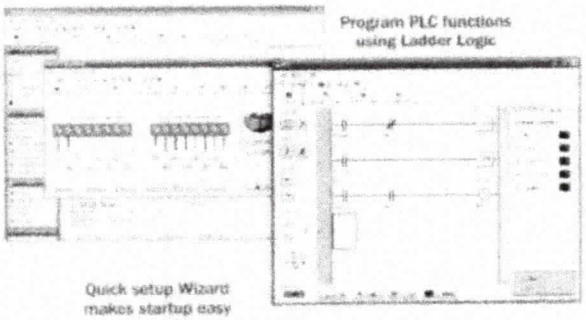
- Auto tuning Sensorless Vector Control with V/Hz mode
- Pulse Width Modulation (PWM) utilizing IGBT Technology
- Built-in PID Control
- 150% rated current for 1 minute, 200% instantaneous
- 2 Analog Inputs: 1 master speed reference accepts 0-10VDC, 4-20mA, and 0-20mA signals and 1 multi function (0-10VDC)
- Digital Inputs: 5 PNP/NPN selectable
- 1 Analog Output (0-10VDC)
- 2 Multi-function Digital Relay Outputs
- Built-in dynamic braking transistor
- Electronic overload protection and stall prevention
- Ground fault and short circuit protection
- DIN rail mountable

Built-in PLC functions at no extra cost:

- Ladder logic programming, up to 40 rungs of code
- Up to 7 Digital Inputs, 2 Relay Outputs, 2 Analog Inputs
- 8 Comparators (4 analog, 4 encoder)
- 8 Timers, 4 Counters, 15 Internal Relays
- UL File #E177007
- 2 year warranty

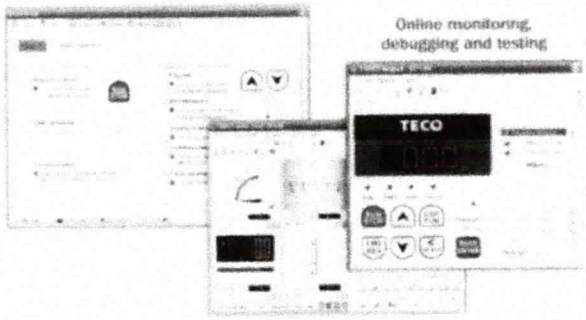
Easy to use terminal view, just click and set!

Program PLC functions using Ladder Logic



Quick setup Wizard makes startup easy

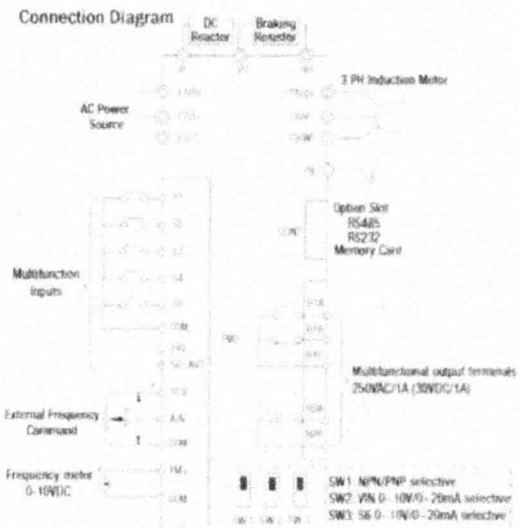
Online monitoring, debugging and testing



CV7300 AC Drives

Part Number	HP	Input Voltage	Output Voltage	Output Amps	Dimensions (inches) H	W	D	Frame
230V Class: Single-phase Input, Three-phase Output								
CV-20P5-H1	0.5	230V, 1 PH	230V, 3 PH	3.1	6.42	3.54	5.79	1
CV-2001-H1	1	230V, 1 PH	230V, 3 PH	4.5	6.42	3.54	5.79	1
CV-2002-H1	2	230V, 1 PH	230V, 3 PH	7.5	7.36	5.04	5.83	2
CV-2003-H1	3	230V, 1 PH	230V, 3 PH	10.5	7.36	5.04	5.83	2
230V Class: Three-phase Input, Three-phase Output								
CV-20P5-H3	0.5	230V, 3 PH	230V, 3 PH	3.1	6.42	3.54	5.79	1
CV-2001-H3	1	230V, 3 PH	230V, 3 PH	4.5	6.42	3.54	5.79	1
CV-2002-H3	2	230V, 3 PH	230V, 3 PH	7.5	6.42	3.54	5.79	1
CV-2003-H3	3	230V, 3 PH	230V, 3 PH	10.5	7.36	5.04	5.83	2
CV-2005-H3	5	230V, 3 PH	230V, 3 PH	17.5	7.36	5.04	5.83	2
CV-27P5-H3	7.5	230V, 3 PH	230V, 3 PH	26	10.24	7.32	7.68	3
CV-2010-H3	10	230V, 3 PH	230V, 3 PH	35	10.24	7.32	7.68	3
CV-2015-N1	15	230V, 3 PH	230V, 3 PH	48	14.17	10.43	8.86	4
CV-2020-N1	20	230V, 3 PH	230V, 3 PH	64	14.17	10.43	8.86	4
CV-2025-N1	25	230V, 3 PH	230V, 3 PH	80	14.17	10.43	8.86	4
CV-2030-N1	30	230V, 3 PH	230V, 3 PH	96	25.67	10.59	10.91	5
CV-2040-N1	40	230V, 3 PH	230V, 3 PH	130	25.67	10.59	10.91	5
460V Class: Three-phase Input, Three-phase Output								
CV-4001-H3	1	460V, 3 PH	460V, 3 PH	2.3	6.42	3.54	5.79	1
CV-4002-H3	2	460V, 3 PH	460V, 3 PH	3.8	6.42	3.54	5.79	1
CV-4003-H3	3	460V, 3 PH	460V, 3 PH	5.2	7.36	5.04	5.83	2
CV-4005-H3	5	460V, 3 PH	460V, 3 PH	8.8	7.36	5.04	5.83	2
CV-47P5-H3	7.5	460V, 3 PH	460V, 3 PH	13	10.24	7.32	7.68	3
CV-4010-H3	10	460V, 3 PH	460V, 3 PH	17.5	10.24	7.32	7.68	3
CV-4015-H3	15	460V, 3 PH	460V, 3 PH	25	10.24	7.32	7.68	3
CV-4020-N1	20	460V, 3 PH	460V, 3 PH	32	14.17	10.43	8.86	4
CV-4025-N1	25	460V, 3 PH	460V, 3 PH	40	14.17	10.43	8.86	4
CV-4030-N1	30	460V, 3 PH	460V, 3 PH	48	14.17	10.43	8.86	4
CV-4040-N1	40	460V, 3 PH	460V, 3 PH	64	25.67	10.59	10.91	5
CV-4050-N1	50	460V, 3 PH	460V, 3 PH	80	25.67	10.59	10.91	5
CV-4060-N1	60	460V, 3 PH	460V, 3 PH	96	30.31	12.13	11.10	6
CV-4075-N1	75	460V, 3 PH	460V, 3 PH	128	30.31	12.13	11.10	6

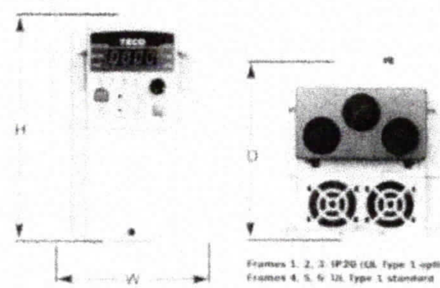
Connection Diagram



Specifications

Output Characteristics	Maximum Output Voltage	230V: 200-240V, 3 Phase 460V: 380-480V, 3 Phase
	Rated Output Frequency	0 - 400Hz
	Output Frequency Resolution	0.01Hz
Power Supply	Rated Input Power	230V: 200-240V, 50/60Hz 460V: 380-480V, 50/60Hz
Control	Control Mode	Sensorless Vector, V/Hz
	Carrier Frequency	2 to 16kHz
	Frequency Control Range	0.1 - 400.0Hz
	Speed Control Accuracy	V/Hz: +/- 2% Sensorless Vector: +/- 0.5%
	Overload Capacity	150% Rated Output Current for 60 sec
	Frequency Setting Signal	0-10VDC, 4-20mA
	Accel/Decel Time	0.1 - 3600 sec (Independent Accel/Decel Times)
	Number of V/F Patterns	18 Preset V/F Patterns, 1 Custom V/F Pattern
	Braking Torque	Approximately 20%
Protective Functions		Stall Prevention, Instantaneous Overcurrent (200%), Motor Overload Protection, Overvoltage, Undervoltage, Momentary Power Loss, Overheat Protection, Ground Fault, Power Charge Indication
Environmental Conditions	Location	Frames 1, 2, 3: IP20 (UL Type 1 available w/ optional adapter box); Frames 4, 5, 6: UL Type 1 standard
	Ambient / Storage Temp.	+14 to 104°F (Not Frozen) / -4 to 140°F
	Altitude / Humidity / Vibration	< 1000m / < 95% RH (Non-condensing) / (1.0G)
Agency Approvals		UL/cUL Listed (E172007), RoHS, CE: 61800-3, EN50178

Dimensions



Frames 1, 2, 3: IP20 (UL Type 1 optional)
Frames 4, 5, 6: UL Type 1 standard

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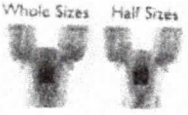
FMP-TECOAC

Super Spray® UP3™ Nozzle Flows - U.S.

Sprinkler Base Pressure			6	10	15	20	25	30	35	40
Nozzle	Color	Orifice (in.)	Flow (gpm)							
4	Light Blue	1/16	0.27	0.35	0.43	0.50	0.56	0.61	0.66	0.70
4.5	Light Blue	9/128	0.35	0.45	0.55	0.63	0.71	0.77	0.84	0.89
5	Beige	5/64	0.43	0.55	0.68	0.78	0.87	0.96	1.04	1.11
5.5	Beige	11/128	0.52	0.67	0.82	0.95	1.06	1.16	1.25	1.34
6	Gold	3/32	0.62	0.80	0.98	1.13	1.26	1.38	1.50	1.60
6½	Gold (notched)	13/128	0.73	0.94	1.15	1.33	1.49	1.63	1.76	1.88
7	Lime	7/64	0.85	1.09	1.33	1.54	1.73	1.89	2.04	2.18
7½	Lime (notched)	15/128	0.97	1.26	1.54	1.77	1.98	2.17	2.35	2.51
8	Lavender	1/8	1.11	1.43	1.75	2.02	2.26	2.48	2.68	2.86
8½	Lavender (notched)	17/128	1.25	1.62	1.98	2.29	2.56	2.80	3.02	3.23
9	Grey	9/64	1.40	1.81	2.22	2.56	2.87	3.14	3.39	3.63
9½	Grey (notched)	19/128	1.57	2.02	2.48	2.86	3.20	3.50	3.78	4.04
10	Turquoise	5/32	1.74	2.24	2.75	3.17	3.55	3.88	4.20	4.49
10½	Turquoise (notched)	21/128	1.92	2.47	3.03	3.50	3.91	4.29	4.63	4.95
11	Yellow	11/64	2.10	2.72	3.33	3.84	4.30	4.71	5.08	5.43
11½	Yellow (notched)	23/128	2.30	2.97	3.64	4.20	4.70	5.15	5.56	5.94
12	Red	3/16	2.51	3.24	3.97	4.58	5.12	5.61	6.06	6.48
12½	Red (notched)	25/128	2.72	3.52	4.31	4.97	5.56	6.09	6.58	7.03
13	White	13/64	2.95	3.81	4.66	5.38	6.02	6.59	7.12	7.61
13½	White (notched)	27/128	3.18	4.11	5.03	5.81	6.49	7.11	7.68	8.21
14	Blue	7/32	3.42	4.42	5.41	6.25	6.99	7.65	8.27	8.84
14½	Blue (notched)	29/128	3.67	4.74	5.81	6.71	7.50	8.21	8.87	9.48
15	Dark Brown	15/64	3.93	5.08	6.22	7.18	8.03	8.79	9.50	10.15
15½	Dark Brown (notched)	31/128	4.20	5.42	6.64	7.67	8.57	9.39	10.14	10.84
16	Orange	1/4	4.48	5.78	7.08	8.17	9.14	10.01	10.81	11.56
16½	Orange (notched)	33/128	4.76	6.15	7.53	8.69	9.72	10.65	11.50	12.30
17	Dark Green	17/64	5.06	6.53	7.99	9.23	10.32	11.31	12.21	13.06
17½	Dark Green (notched)	35/128	5.36	6.92	8.47	9.78	10.94	11.98	12.94	13.84
18	Purple	9/32	5.67	7.32	8.96	10.35	11.57	12.68	13.69	14.64
18½	Purple (notched)	37/128	5.99	7.73	9.47	10.93	12.22	13.39	14.46	15.46
19	Black	19/64	6.31	8.15	9.98	11.52	12.89	14.12	15.25	16.30
19½	Black (notched)	39/128	6.65	8.58	10.51	12.14	13.57	14.86	16.05	17.16
20	Dark Turquoise	5/16	6.99	9.02	11.05	12.76	14.27	15.63	16.88	18.05
20½	Dark Turquoise (notched)	41/128	7.34	9.47	11.60	13.40	14.98	16.41	17.72	18.95
21	Mustard	21/64	7.70	9.93	12.17	14.05	15.71	17.21	18.59	19.87
21½	Mustard (notched)	43/128	8.06	10.40	12.74	14.71	16.45	18.02	19.46	20.80
22	Maroon	11/32	8.43	10.88	13.33	15.39	17.20	18.85	20.36	21.76
22½	Maroon (notched)	45/128	8.81	11.37	13.92	16.08	17.98	19.69	21.27	22.74
23	Cream	23/64	9.19	11.87	14.54	16.78	18.77	20.56	22.20	23.74
23½	Cream (notched)	47/128	9.58	12.37	15.15	17.49	19.56	21.43	23.14	24.74
24	Dark Blue	3/8	9.98	12.86	15.78	18.22	20.37	22.31	24.10	25.77
24½	Dark Blue (notched)	49/128	10.38	13.40	16.4	18.95	21.18	23.20	25.06	26.79
25	Copper	25/64	10.78	13.92	17.05	19.69	22.01	24.11	26.04	27.84
25½	Copper (notched)	51/128	11.19	14.45	17.69	20.43	22.84	25.02	27.03	28.89
26	Bronze	13/32	11.60	14.98	18.35	21.18	23.68	25.94	28.02	29.96

UP3 Nozzle Visibility

The color-coded nozzles are highly visible and easy to identify. The nozzle numbers (corresponding to orifice size in 64ths of an inch) are visible on the ears, with half-sizes denoted beneath the second digit and notches on the lower edge of the nozzle.



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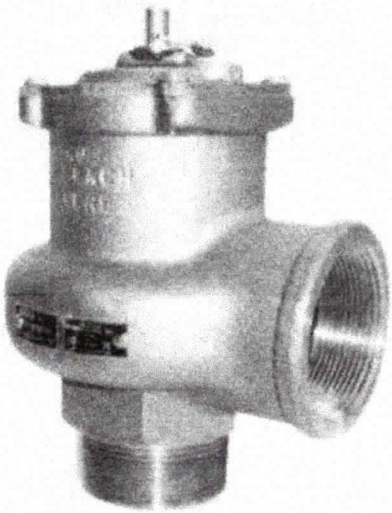

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Note 4

Lift stations in the subdivisions will be based on the vacuum side of two GT103 centrifugal pumps. These pumps will be equipped with CV-2001_H1 Variable Frequency Drive (VFD) same drive as recirculation pumps . Using the VFD will help soft start pumps when on generator back up. Those STEG systems tanks that cannot flow via gravity to the main plant will flow to lift stations located in low areas. Each of these tanks will have a pipe that runs back to the main plant and be connected to a set of two alternating pumps in the control room lift pump wall. There will be a check type foot valve located in each tank to maintain prime. There also will be check valves in the control room. Each control room pump check valve will have a 1/8 inch hole that allows a small flow back to maintain prime. At times when other pumps supplying the spray wobblers in the trickle filter reach a PSI greater than the PSI needed to expel air and when the lift pump is not pumping, the suction line would be pressurized. Each pipe from the lift station tanks will be equipped with a vent check valve to release air pressure and hold vacuum at any high points (see Detail 1). If the pipe from the lift stations to the control room develops any air pockets this will purge the air from the pipe using the high pressure from the other pumps. The pumps used to pull the effluent from the tanks will also be the self priming type Goulds GT Irri-Gator GT103.

The maximum distance from the control room will be 5000 feet and the maximum lift will be 15 foot total elevation. A four inch schedule 40 PVC solid core pipe will be used for the supply line. At 40 GPM the friction loss in the 4 inch line is .092 foot of head per 100 ft of line. .092 x 700 is 4.6. The total lift needed is 19.6. These pumps pull 25 foot of vacuum head. The GT103 when at 25 foot lift will discharge 41 GPM at 20 psi discharge pressure. Not more than 50 homes or a total of 15,000 gallons per day will enter a lift station. With a 4 peaking factor of 60,000 gallons per day would be 41.6 gallons per minute flow. If a high level is detected with a float switch that will be in the lift station tank, both pumps would be activated. Additionally the PLC controls would send an alarm via text letting utility workers know there is a high flow situation. When a low float that will be located in the lift station is down, the pumps are turned off.

Easements will be set aside to access lift station tank and electrical power available. If for any reason these lifts cannot be meet traditional powered lift pumps and backup generators will be installed and designed by others.

A solar pump will be added to this project to help increase efficiency and save energy cost. The addition of solar pumping is in addition to and not directly needed for plant operation. The pump is located in the main tank with the recirculation pumps (see note 3). A Grundfos 60 SQF-3 pump will be used, and max flow rate with full solar is expected to be 70 GPM. When solar power is available the pump will activate and pump through the 2 inch schedule 40 pipe from the main tank to the control room. This

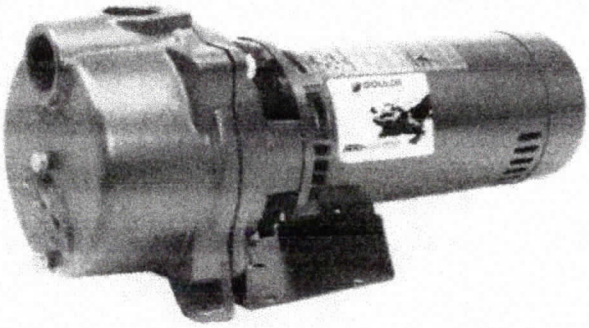
pipe should be about 50 foot in length and at 7O GPM has 3.71 foot of head friction loss. Fifty foot of 3 inch pipe running from the control room to the sprayers Fl = .54 foot of head. Elevation loss from lower tank level to sprayer level equals 15' EL. Head need to flow sprayers at 6 PSI is 13.8 foot of head. Fittings in the piping is estimated at 4.5 foot of head. Totals of 3.71+.54+15+13.8+4.5=37.77, at this pressure the max flow for the SQF-3 = 70 GPM. During times of lower solar output, the flow rate would fall as would friction loss numbers. It is important to note that this pump has enough pressure to close off the recirculation pumps when set to 6 PSI or 13.8 foot of head, but not enough to stop flow from the lift pumps or recirculation pumps when they are at full power mode. This set up should maximize solar output without compromising regular pumping needs.

If flow to the trickle filter sprayers is greater than the nozzle and pump timer setting, an adjustable PRV (Pressure Relief Valve) will trip at 10 psi. This will allow flow to the high flow sprayers trickle filter. These sprayers have large openings and are set to flow about 50 gallons per minute.

The Return flush from filter wall pipe receives the back wash from the disk filters on the filter wall in the control room. The backwash will flow backwards to the solar pump and back wash the pump intake screen keeping it from clogging.

The solar panels will be ground based and set in two arrays, one facing South, South East and the other facing South, South West. This should maximize the daily sun output as simply as possible. Each array will use Mono Silicate type panels totaling more than 1400 watts for each array.

TECHNICAL BROCHURE
BGT R3



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FEATURES

Self-Priming Design: Once pump is initially primed, filled with water, it will reprime when the water level rises above the end of the suction pipe.

Serviceable:

- Back pullout design allows disassembly of pump for service without disturbing piping.
- Two compartment motor for easy access to motor wiring and replaceable components.

Diffuser (Guidevane): Bolt down diffuser provides positive alignment with impeller. F.D.A. compliant, injection molded, glass filled Lexan® for durability and abrasion resistance.

Corrosion Resistant: Electro-coat paint process is applied inside and out, then baked on.

APPLICATIONS

Specifically designed for the following uses:

- Lawn sprinkling
- Irrigation
- Air conditioning systems
- Heat pumps
- Water transfer
- Dewatering

SPECIFICATIONS

Pump:

- Pipe connections: 1½" NPT suction • 1½" NPT discharge
- Capacities: to 110 GPM at 5 foot suction lift
- Heads: to 128 feet
- Reprime capabilities: to 25 feet suction lift
- Maximum water temperature: 140° F (60° C)
- Rotation: clockwise when viewed from motor end.

Motor:

- NEMA standard open drip proof
- 60 Hz, 3500 RPM
- Stainless steel shaft
- Single phase: ¾-1½ HP, 115/230 V; 2 and 3 HP, 230 V only. Built-in overload with automatic reset.
- Three phase: 230/460 V. Overload protection must be provided in starter unit. Starter and heaters (3) must be ordered separately.
- Optional TEFC motors are available. See price book for order numbers.

Options:

- Add a "B" suffix for a Silicon Brass Impeller, ex. GT07B
- Add an "S" suffix for an Extended (higher) Base.

Impeller: **Standard** - glass-filled, abrasion resistant Noryl®
Optional - Silicon Brass is available (lead content is < .05%)

Casing: Cast iron, 4-bolt, back pull-out design. Openings for vacuum gauge and casing drain.

Powered for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits. Can be operated continuously without damage.

Mechanical Seal: Carbon/ceramic faces, BUNA elastomers, 300 series stainless steel metal parts. Diaphragm prevents the seal from running dry.

AGENCY LISTINGS

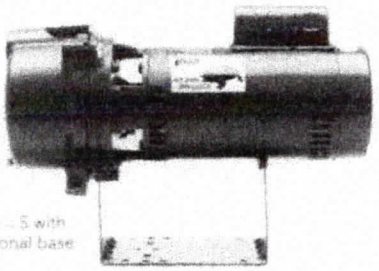
Canadian Standards Association (except GT30_)

Class 6853 01 - Low Lead Content Certification

STANDARD ODP MODELS

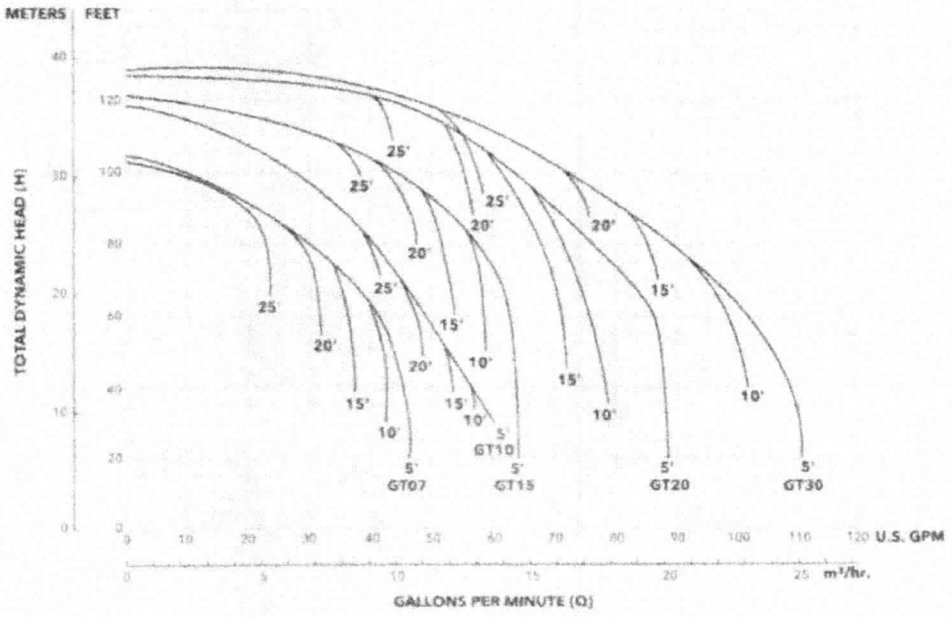
Model	HP	Phase
GT07	¾	1
GT10	1	
GT15	1½	
GT20	2	
GT30	3	
GT073	¾	3
GT103	1	
GT153	1½	
GT203	2	
GT303	3	

Add an "S" suffix for extended base. See back page.



GT ... S with optional base

PERFORMANCE CURVE



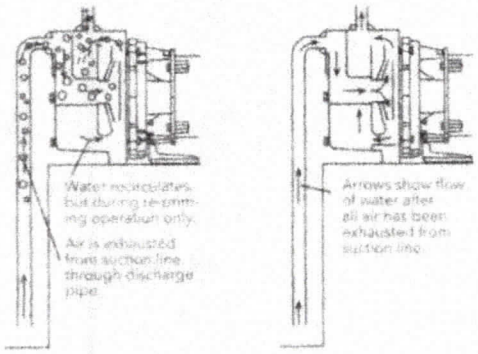
Single and three phase have same performance

PERFORMANCE RATINGS

Model	PSI Discharge Pressure	Suction Lift in Feet				
		5	10	15	20	25
GT07/ GT073	20	44	41	36	31	24
	30	34	31	26	22	14
	40	10	4	0	0	0
GT10/ GT103	20	53	51	49	46	41
	30	43	41	38	36	32
	40	29	22	16	8	0
GT15/ GT153	20	63	59	54	49	39
	30	60	55	51	46	37
	40	45	38	33	20	14
GT20/ GT203	20	86	77	70	59	46
	30	80	72	67	57	44
	40	65	60	57	50	43
GT30/ GT303	20	105	100	88	76	60
	30	92	90	84	75	57
	40	73	67	62	55	50

Performance ratings are in GPM.

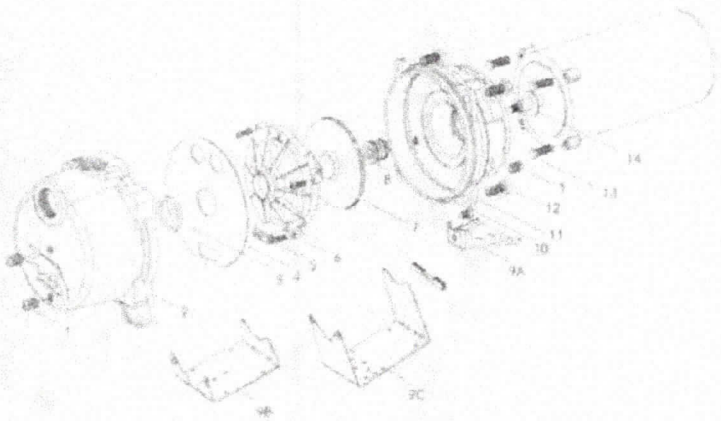
SELF-PRIMING (AFTER INITIAL PRIME)

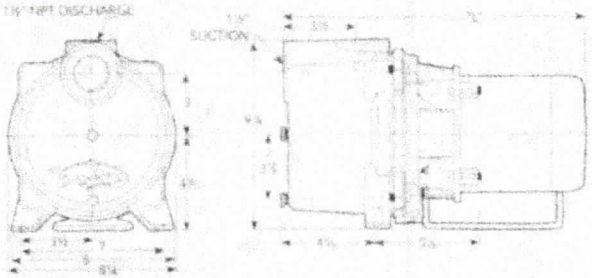


COMPONENTS

Item No.	Description
1	Plug - ¼" NPT
2	Casing
3	Seal ring - diffuser
4	Diaphragm
5	Machine screw
6	Diffuser with SS wear ring
7	Impeller
8	Mechanical seal
9A	Foot - ¾ and 1 HP
9B	Base - 1½ HP and up
9C	Extended base - "S" suffix ③
10	Bolt - foot to adapter
11	Motor adapter
12	Bolt - casing to adapter
13	Bolt - adapter to motor
14	Deflector

③ 9C - Order by adding an "S" suffix, ex. GT07S
It is also sold as a 15KB6 stand alone part





DIMENSIONS AND WEIGHTS

Model	GT07	GT10	GT15	GT20	GT30	GT073	GT103	GT153	GT203	GT303
HP	½	1	1½	2	3	¾	1	1½	2	3
Length "L"	19⅝	19⅝	21⅜	20⅞	21⅜	19	19⅝	20⅛	20⅝	21⅜
Width	8¼									
Height	9¾ (13⅜ with "S" Base)									
Weight (lbs.)	48	52	60	65	76	49	52	55	69	71
Phase	Single					Three				

(All dimensions are in inches and weights in lbs. Do not use for construction purposes.)

xylem
Let's Solve Water

Xylem Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.gouldswatertechnology.com

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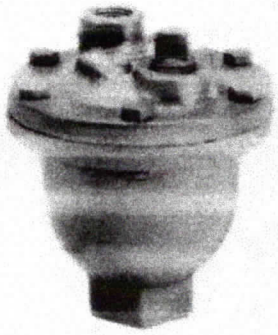
gamut
A Grainger Company



Air Release Valve: 1 in Inlet Thread Size, Cast Iron, Alkyd Primer, 175 psi Max Working Pressure, 5 1/4 in Overall Ht

Item # 207K139

$125.20 Each

Product Specs

Body Material:	Cast Iron
Body Finish/Coating:	Alkyd Primer
Inlet Thread Size:	1 in
Maximum Working Pressure:	175 psi
Maximum Vent Capacity:	6 scfm
Overall Height:	5 ¼ in
Overall Length:	5 ¼ in
Overall Width:	4 ¾ in
Maximum Fluid Temperature:	250 ° F
Vacuum Pressure:	29 in of Hg
Application:	Water or Wastewater Treatment Plant; Pump; Pipeline; Hydropneumatic Tools; Pressure Filters; Transmission Fire Pumps; Water Distribution; Clean Water
Color:	Blue
Display Sell UOM:	EA
Features:	Releases Pockets of Accumulated Air; On-Clog Design Eliminates Backwashing; Performance Proven for Over 40 Years; Resilient Seating for Positive Shutoff
Float Material:	Stainless Steel
For Fluid Type:	Waste water; Water

Inlet Gender:	Female
Inlet Type:	NPT
Lead-Free:	Yes
Manufacturer Warranty Length:	1 yr
Maximum Operating Temperature:	250 °F
Minimum Operating Temperature:	32 °F
Not for Fluid Type:	Water
Outlet Gender:	Female
Outlet Thread Size:	1 in
Outlet Type:	NPT
Potable Water Application Use:	No
Specifications Met:	ANSI 61; ASTM A126 Class B; UL Listed; NSF 61; FM Approved; AWWA C512; NSF 372; ANSI 372
Wetted Material:	Cast Iron; Stainless Steel; Buna-N

Compliance and Restrictions

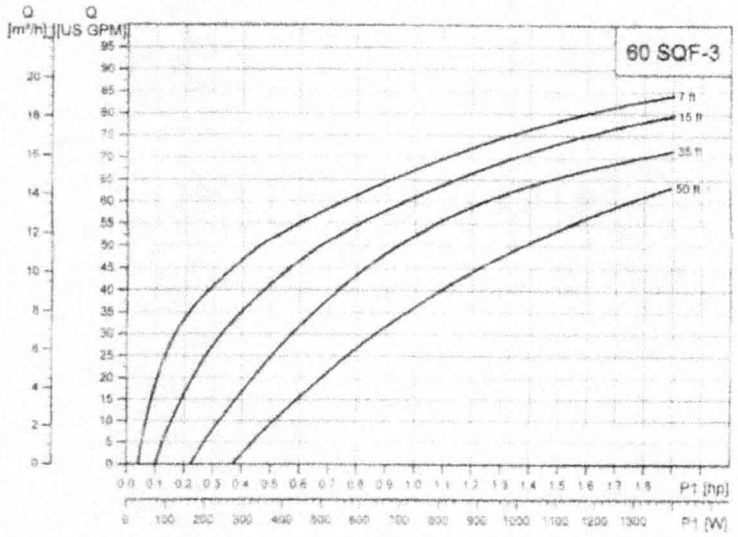
Country Of Origin
USA

About Air & Vacuum Release Valves

Protect your pressurized pipelines from damage caused by air-related pressure surges, and keep your system running efficiently by installing these valves. Air release valves continuously release accumulated air during system operation. Air vacuum valves exhaust air at system startup to prevent vacuum damage or pipeline collapse if negative pressure develops during operation. Valves meet AWWA (American Water Works Association) C512 standard and have a resilient float seat that provides positive shutoff down to the lowest system pressure.

An excellent choice for clean water distribution and transmission systems, these valves are designed to reduce the build-up of debris and scale.

60 SQF-3



Note: Max. P1 (W) shown on curve represents max. motor RPM.

Note 5

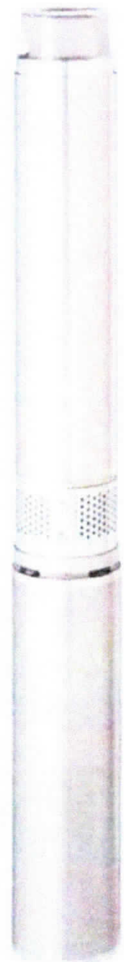
This wall in the control room is dedicated to the drip field filtering and pumping. There are two alternating PLC controlled pumps located in the main dosing tank (Myers J1025 BE-01). These pumps feed through 2 inch schedule 40 PVC pipe approximately 50 foot long Fl = .68 ft head. The flow to the drip field at normal rate will be 21.2 gallons per minute. There are 2083 emitters per zone at .61 gallons per hour for each emitter. During back flush, 27.6 GPM is needed. The PLC controls automatically brings both pumps online during back flush providing extra flushing. Our flow calculations are set to 27.6 gallons per minute.

As the effluent enters the filter wall, it passes two check valves then flows to the scrubber valves (Rain Bird BESBR 2"). These valves open when the PLC starts pumping to the drip field. There are 3 total filter lines to the drip field. If one of these lines stops up, the PLC will send an alert to utility personnel as determined by the pressure switches. The two remaining lines will provide ample flow to continue operations. Next, the effluent passes through the Arkal 130 micron 2 " disk filters. By closing and opening the solenoid valves, the PLC can back flush each disk filter to keep the filters clean and flowing. The disk filters are cleaned at the beginning of each pump cycle or any time the differential pressure switch activates showing clogging back pressure. The filters are back flushed with effluent filtered by the other two filters. During back flushing operations, the Normally Open solenoid valve is closed to maximize flush pressure. Effluent used for flushing is then sent to the non pumping drip pump or the solar pump to clear their intake screens. The solenoid valve before one filter is closed and the solenoid valve below the filter is opened for 20 seconds. Then the PLC moves on to the next filter line and so on.

After the filters, there is a flow meter in line that allows the PLC to keep track of how much effluent is pumped out to the drip field. There is a final PSI switch before the effluent goes out to the drip field that tells the PLC if a solenoid did not open at one of the zones when it was turned on. During the first 4 minutes of pumping, there is a solenoid valve that opens (see Detail 2 System Flow Chart)that flushes the drip tubing at 2 ft per second keeping it clean inside.

The pipe to and from the drip field is approximately 2600 feet. Because accuracy is paramount in drip field calculations, a Spreadsheet chart is provided. The friction loss in 1/3 flow to each the disk filters is so low, it is not considered. The friction loss in 1/3 of flow to the 2 inch PESB solenoid valve are also not considered because it is so low. The friction loss from the main plant tank to the filters is .68 foot of head. The chosen pump shows ample capability to provide necessary flow and pressure. These valves and filters are normally stocked items for the utility.

MYERS® J-BE Series



J-BE

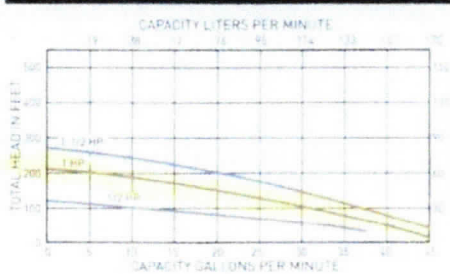
SPECIFICATIONS

Description	High Head Filtered Effluent Pumps	
HP	1/2, 1 & 1-1/2	
Maximum Capacity	50 GPM	189 LPM
Maximum Shut-off Head	280'	85.3 m
Discharge	2" NPT	
Solids handling	1/16"	1.6 mm
Voltage	115 & 230	
Full Load Amps	6.0 - 13.1	
Phase	Single	
Cord Length	10' & 30'	3.1 m & 9.1 m
Switch Options	M (Manual)	
Impeller Material	Enclosed Thermoplastic	
Housing Material	Stainless Steel	
Diffuser Material	Composite	
Warranty Years	1	

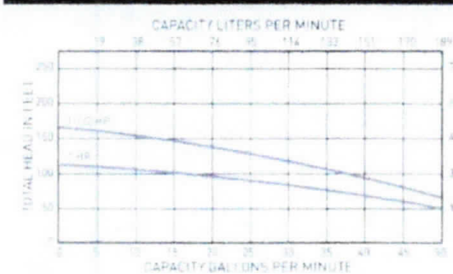
FEATURES

- Corrosion-resistant design for long life
- Cost-effective wastewater systems
- Built-in overload protection

25 GPM - J-BE



35 GPM - J-BE

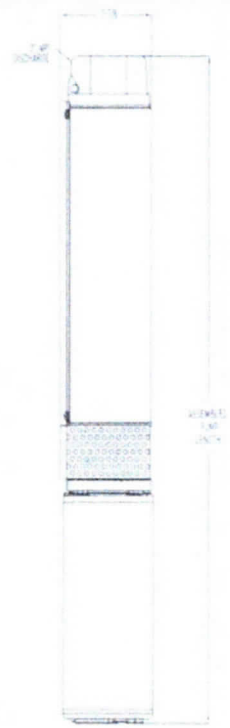


PENTAIR

M12742WS

MYERS® J-BE Series

DIMENSIONS



ORDERING INFORMATION

GPM	Motor Type	HP	Stg.	PH	Volt	Catalog Number	Assembled Pump Length Inches	Weight Pounds
25	2-Wire	0.5	4	1	115	J0525BE-01	26.5	37
25	2-Wire	1.0	7	1	230	J1025BE-01	30.3	37
35	2-Wire	1.0	4	1	230	J1035BE-01	27.2	35
25	2-Wire	1.5	9	1	230	J1525BE-01	35.0	43
35	2-Wire	1.5	6	1	230	J1535BE-01	32.6	41

PENTAIR

USA
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CANADA
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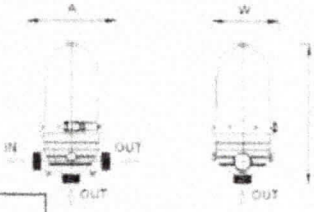
M12242WS (11/16/17)

ARKAL
FILTRATION SYSTEMS

Arkal 2" Dual Filter with a detachable spine

Angle/Line Filter

Catalog No. 1204 0_ _ _



Features

- 2 Outlet options – in line or angle
- Non-corrosive
- Detachable spine
- Pressure differential disc compression
- Robust design
- Drain valve at the bottom (optional)
- High volume filter with increased flow capacity
- Adapts to horizontal or vertical installation
- Easy clamp-on filter cover
- Pressure testing ports at filters inlet and outlet
- Available in various filtration grades

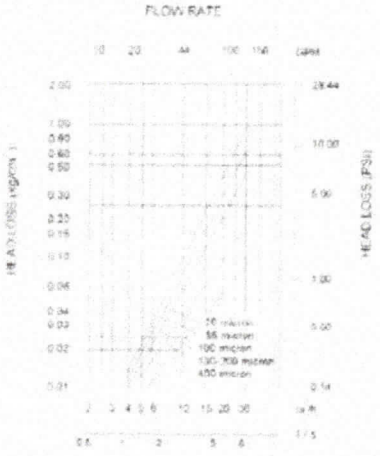
Technical Data

Inlet/outlet diameter	2" BSPT (male) 50 mm – nominal diameter	2" NPT (male)
Maximum pressure	12 atm	168 psi
Max flow rate	25 m^3/h	110 gpm
General filtration area	953 cm^2	148 in^2
Filtration volume	1225 cm^3	75 in^3
Filter length	465 mm	18 5/6"
Housing diameter	200 mm	7 7/8"
Distance between end connections	A = 76 mm B = 130 mm	A = 3" B = 5 1/8"
Outer diameter of filter element	115 mm	4 17/32"
Length of filter element	261 mm	10 3/16"
Weight	5 kg.	11 pounds
Maximum temperature	70° C	158° C

Filtration Grades

Blue (400 micron / 40 mesh)
Yellow (200 micron / 80 mesh)
Red (130 micron / 120 mesh)
Black (100 micron / 140 mesh)
Green (55 micron)
Grey (20 micron)

Head Loss Chart



AK 2" DUAL 9606 71/04EN 11/07

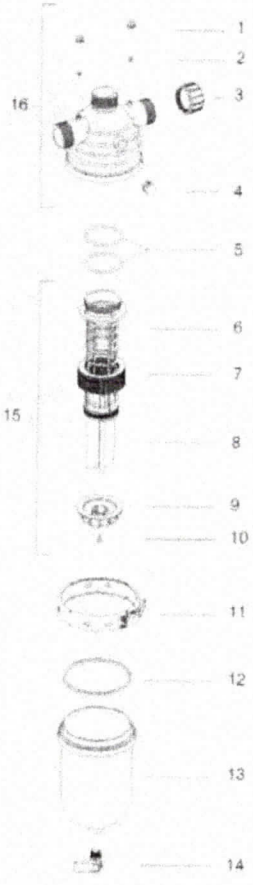
ARKAL
FILTRATION SYSTEMS

Arkal 2" Dual Filter with a detachable spine

Part List

No.	Cat. No.	Description	Materials
1	2511 0103	Gauge port nut (single unit)	RPP
2	5006 0004	Gauge port seal (single unit)	EPDM
3	2511 0200	2" Cap	RPA
4	5019 0112	½" Plug	PP
5	5003 2238	O-ring 2-238	EPDM
6	2502 0212	Spine	RPP
7	2021 1_ _ _	Disc set	PP
8	2502 0214	Spine extension	PP
9	2506 0211	Fixing nut	RPP
10	5040 1010	Fastening bolt	SS
11	5042 0030	Clamp	SS
12	5005 0002	Cover seal	EPDM
13	2501 0220	Filter cover	RPA
	2202 0022	Filter cover with stoper with ½" threaded	RPA
	2501 9220	Transparent cover with stopper	RPA
14	5054 0212	½" x ¼" Tap (*)	BRASS
15	2121 1_ _ _	Filter element	
16	2204 0001	Filter body complex BSP	
	2204 0002	Filter body complex NPT	

(*) Optional



Materials

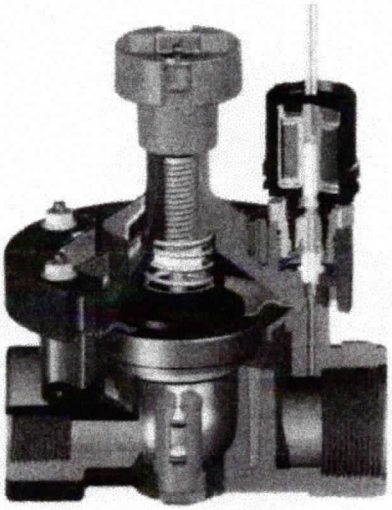
RPP - REINFORCED POLYPROPYLENE
RPA - REINFORCED POLYAMIDE
SS - STAINLESS STEEL
PP - POLYPROPYLENE
PC - POLYCARBONATE

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL
FILTRATION SYSTEMS

AK 2" DUAL 9600 7170HEN 11/07

Valves



PESB-R Cutaway

PESB-R Series Valves

Durable Chlorine-Resistant Valves for Reclaimed Water Applications

- Reliable operation even in heavily chlorinated water. Valve diaphragm composed of EPDM, a rubber material which is chlorine and chemical resistant
- Plastic valve parts molded of plastic which is chlorine and chemical resistant
- Body constructed of durable glass-filled nylon for long life and heavy-duty performance at 200 psi (13.80 bar) pressure

Features

- One-piece solenoid design with captured plunger and spring for easy servicing. Prevents loss of parts during field service
- PESB-R Conversion Kits also available to convert existing PEB and PESB valves to reclaimed water valve. Kit includes NP handle, sticker, diaphragm assembly, scraper and snap washer
- Stainless steel studs molded into the body. Bonnet can be attached and removed easily without damaging threads
- External bleed protects the solenoid ports from debris when system is flushed
- Internal bleed operates the valve without allowing water into the valve box; allows pressure regulator to be adjusted without turning on the valve at the controller first
- Low-flow operating capability (0.25 gpm; 0.06 m^3/h; 1.2 l/m) for a wide range of applications
- Slow closing to prevent water hammer and subsequent system damage
- Scrubber mechanism scrapes stainless steel screen clean to break down grit and plant material
- Purple flow control handle standard on PESB-R Series valves
- Compatible with Rain Bird MDC Decoder System

150-PESB-R

How To Specify

100 - PESBR - PRS-D

Size
100: 1"
150: 1 1/2"
200: 2"

Model
PESB-R
scrubber
model

Optional Feature
PRS-D: pressure
regulating
module

Note: valve and PRS-D module must be ordered separately.

Options (Order Separately)

- Accommodates optional, field installed PRS-D pressure regulating module to ensure optimum sprinkler performance
- Accepts latching solenoid for use with Rain Bird battery-operated controllers up to 150 psi (10,35 bar)

Operating Range

- Pressure: 20 to 200 psi (1,38 to 13,80 bar)
- Flow: 0.25 to 200 gpm (0,06 to 45,40 m^3/h; 1,2 to 757 l/m)
- Flow with PRS-D: 5 to 200 gpm (1,14 to 45,40 m^3/h; 19,2 to 757 l/m)
- Temperature: up to 150° F (66° C)

Electrical Specifications

- Power: 24 VAC 50/60 cycle solenoid
- Inrush current: 0.41 A (9.84 VA)
- Holding current: 0.28 A (6.72 VA)
- Coil resistance: 30 - 39 ohms

Dimensions

	Height	Length	Width
• 100-PESB-R	6" (16,5 cm)	4" (10,2 cm)	4" (10,2 cm)
• 150-PESB-R	8" (20,3 cm)	6" (15,2 cm)	6" (15,2 cm)
• 200-PESB-R	8" (20,3 cm)	6" (15,2 cm)	6" (15,2 cm)

Note: The PRS-D option adds 2" (5,1 cm) to valve height

Models

• 100-PESB-R	1" (26/34)
• 150-PESB-R	1 1/2" (40/49)
• 200-PESB-R	2" (50/60)
• 100-PESB-R-WK	1" (26/34) Conversion Kit
• 150-PESB-R-WK	1 1/2" (40/49) Conversion Kit
• 200-PESB-R-WK	2" (50/60) Conversion Kit

BSP threads available, specify when ordering

PESB-R Series Valve Pressure Loss (psi)

gpm	100 - 1"	150 - 1 1/2"	200 - 2"
0.25	1.6	-	-
0.5	3.0	-	-
1	1.8	-	-
5	2.9	-	-
10	2.9	-	-
20	2.6	3.5	-
30	5.8	3.1	-
40	10,2	2.3	-
50	16.0	2.1	3.7
75	-	4.3	3.3
100	-	7.5	4.7
125	-	11.9	8.6
150	-	17.0	12.6
175	-	-	14.8
200	-	-	18.9

PESB-R Series Valve Pressure Loss (bar) **METRIC**

m^3/h	l/m	100 - 1"	150 - 1 1/2"	200 - 2"
0.06	1	0.11	-	-
0.3	5	0.13	-	-
0.6	10	0.15	-	-
1.2	20	0.20	-	-
3	50	0.19	-	-
6	100	0.32	0.22	-
9	150	0.69	0.16	-
12	200	-	0.16	0.25
15	250	-	0.24	0.24
18	300	-	0.33	0.25
21	350	-	0.45	0.30
24	400	-	0.59	0.38
27	450	-	0.75	0.53
30	500	-	0.91	0.67
33	550	-	1.10	0.82
36	600	-	-	0.92
39	650	-	-	1.00
42	700	-	-	1.13
45	757	-	-	1.30

Recommendations

1. Rain Bird recommends flow rates in the supply line not to exceed 7.5 ft/sec (2,29 m/s) in order to reduce the effects of water hammer.

2. For flows below 5 gpm (1.14 m^3/h; 19,2 l/m), Rain Bird recommends use of up-stream filtration to prevent debris from collecting below the diaphragm.

3. For flows below 10 gpm (2,27 m^3/h; 37,8 l/m) Rain Bird recommends the flow control stem be turned down two full turns from the fully open position.

Notes

1. Loss values are with flow control fully open.

2. PRS-D recommended for use in shaded area only.

The Netafim Bioline® Calculator estimates the amount of Bioline needed to install a wastewater drip dispersal system, along with other design parameters. It is NOT intended to replace a professional design, and should be used for estimating purposes only. Always consult with a professional designer. Do not use this program with other brands of products.	General Instructions	Fill in the violet-shaded cells. Output information will automatically be calculated and shown in blue-shaded cells. Do not attempt to enter data into the blue-shaded cells. It will erase the formula and potentially impact other output data. To save your information as a .txt file for future reference or submittal, fill in the information in the project's name and address fields below. The name you choose for "Job Name/Homeowner" will become the name of the .txt file. It will be saved on your computer when you click the "Save to File" button at the bottom of the sheet. A file folder will be created for you called "Netafim" and the file will be stored there. For example, if the Job Name / Homeowner for the project is Mr. & Mrs. Jones, all of your information will be saved in a file folder called "Netafim" and the file in this folder will be called "Mr. & Mrs. Jones.txt".

Netafim Bioline® Dripperline Design Recommendations - Based on Maximum Emitter Discharge Rate Per Day

Job Name / Homeowner
Address
City, State, Zip
Permit Agency
Installer Name
Designed By
Date

System Data Input	
Gallons Per Day	36,000
Maximum Emitter Discharge Rate Per Day	1.44
Select Emitter Flow Rate (GPH)	0.61
Select Emitter Spacing (inches)	24
Flush Velocity (fps)	2

Assumptions	
Estimated Pump Flow Rating (GPM)	50
Inlet Pressure (psi)	26
Inlet Pressure (Feet of Head)	67.8
Row Spacing Between Driplines (feet)	3
Number of Zones	12
Hours Per Day to Use for Dosing	18
Elevation Change from Pump to Dose Tank Outlet (feet)	8
Elevation Change from Dose Tank to Drip Field (feet)	3
Length of Supply Line & Supply & Flush Manifolds (feet)	2600
Type of Pipe - Supply Line & Manifolds	PVC Sch40
Size of Supply & Manifold Pipe (inches)	2
Pipe Roughness Constant	150
Inside Diameter of Pipe (inches)	2.067
Number of Daily Dosing Events Per Zone	4

Calculation Outputs	
Total System Information	
Application Area Required (square feet)	150,000
Total Amount of Bioline® Required (feet)	50,000
Total Number of Emitters in the Dripfield	25,000
Zone Information	
Number of Zones	12
Amount of Bioline® Per Zone (feet)	4,167
Number of Emitters Per Zone	2,083
Minimum Number of Laterals Per Zone	7
Maximum Number of Laterals Per Zone	10
Number of Laterals That Will be Used	4
Maximum Length of Bioline® Laterals Based on Inlet Pressure	321
Flow Rate Per Zone (GPM)	21.2
Holding Capacity of Dripperline Per Zone (Gallons)	56.4
Additional Flow Requirement to Accommodate Flushing Velocity	6.4
Holding Capacity of Piping	
Holding Capacity (Gallons) of Supply Line & Supply & Flush Manifolds	403.7
Holding Capacity (Gallons per Zone) of Bioline	35.4
Holding Capacity (Gallons) of Supply Line, Manifolds and Dripperline	908.8
Head Loss Data - Dosing & Flushing Cycle	
Friction Loss (per 100' feet) in Supply Line & Manifolds	0.6
Velocity (fps)	2.6
Friction Loss in Supply Line & Manifolds (psi)	16.1
Friction Loss in Supply Line & Manifolds (Feet of Head)	36.8
Additional Pressure Required for Return Manifold and Piping to Tank (psi)	4.9
Additional Pressure Required for Return Manifold and Piping to Tank (Feet of Head)	11.3
TDH (Total Dynamic Head) in Feet of Head	104.5
Control Settings Information	
Total System Runtime Per Day (Minutes)	142
Total Runtime Per Zone Per Day (Minutes)	12
Total System Dosing Events Per Day	48
Runtime Per Each Dose (Minutes)	3
Off Time Between Doses in the Same Zone (Hours to nearest 0.1)	2
Miscellaneous Information	
Dosing Volume Per Emitter Per Dose (gallons)	0.37
Inches Per Week of Dosing	2.89
Volume of a Single Dose (gallons)	782.5
Pump Selection	
Pump Flow Rating (GPM)	27.6
TDH (Total Dynamic Head) in Feet of Head	104.5
Pump Manufacturer	[illegible]
Pump Model	[illegible]

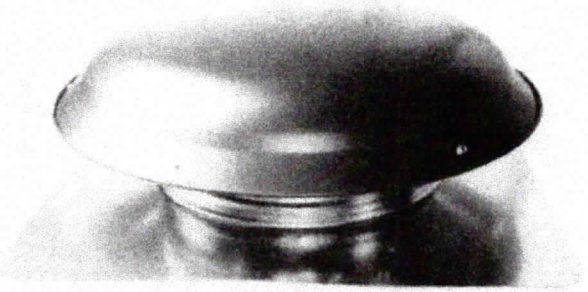
Note 6

Air supply will be provided by a down draft fan located on the trickle filter riser. A standard roof vent type fan will be used. The fan will be removed from its' housing then replaced in the down draft direction. The fan motor will be direct wired to a breaker in the control room and run at all times. A sensor will be installed to the PLC and an alarm will be sent to utility workers if the fan fails. If the #1 fan fails, a second fan set to exhaust and located on the main dosing tank will be switched on by the PLC. The 2nd fan, when idle, will serve as the exhaust for the air from the trickle filter. The air flow will travel down through the trickle filter through a 10 inch pipe from the trickle filter to the main dosing tank, then out the backup fan unit. This will give air to the trickle filter and stop gases from building up in the main dosing tank.

Each fan unit will be rated at 1080 CFM which is far in excess of what is required. The extra air flow should help make the process even more efficient.

Home / Heating, Venting & Cooling / Ventilation / Attic Fans & Vents / Electric Vents

Model # CX1000AMWGUPS Internet #202913743



Live Chat

Share Save to Favorites Print

Ventamatic >

Cool Attic 1080 CFM Weathered Grey Galvanized Steel Power Attic Roof Ventilator

★★★★ (29) Write a Review Questions & Answers (23)

$56.47 /each

Quantity - 1 +

Note 7

To maintain sludge removal without needing to stop plant treatment operations a sludge, removal pump will be located in the main dosing tank. The designed pumping rate is 45 GPM for 1 minute intervals. With several hours between pumping, this will give the sludge time to settle out in the sludge tank. A 2 inch schedule 40 PVC pipe approximately 100 foot long will go from the sludge pump to the sludge tank with FL = 3.27 foot of head. The elevation gain from the dosing tank to sludge tank is 10 foot of head. Fittings are estimated at FL of 2 foot of head. A Liberty Model 281 pump has been selected and is an energy saving model. The Liberty 281 is also a normally stocked item for the utility. A tee will be located at the exit end of the septic tank and a schedule 40 4 inch PVC pipe. Which will flow by gravity back to the sewer line as it enters the main dosing tank.

The sludge tank will be a 1000 gallon single chamber septic tank. The tank will have a Polyloc riser located in the center of the lid. This lid will allow a septic tank pumper to be allowed to remove the sludge at a convenient location. Once removed the sludge will be transported to a proper disposal facility such as a municipal treatment plant.

Liberty Pumps®

280-Series

Cast Iron Submersible Effluent/Sump Pumps

1/2 hp
1-1/2" Discharge
3/4" Solids Handling

Features:

- Liberty's unique, one-piece "Uni-Body" casting
- Quick-disconnect 10' standard power cord allows replacement of cord in seconds without breaking seals to motor (other lengths available)
- Permanently lubricated upper and lower bearings
- Oil-filled, hermetically sealed motors with thermal overload protection
- Stainless steel, removable bottom screen
- Stainless steel rotor shaft
- Stainless steel fasteners

115 V. Models:

280 Manual

281 Wide-Angle Float with Quick Disconnect

283 Wide-Angle Float, Series Plug

287 VMF, vertical magnetic float for heavy-duty sump pump applications

208-230 V. Models:

280HV Manual

281HV Wide-Angle Float with Quick Disconnect

283HV Wide-Angle Float, Series Plug

287HV Vertical Magnetic Float (VMF) Switch

Wide-Angle Floats are mercury-free, mechanically activated.

evolve.

280-SERIES

1/2 hp Submersible Effluent/Sump Pumps

The Liberty 280-Series provides a cost effective "mid-range" pump for on-site waste water systems, liquid waste transfer and commercial heavy-duty sump pump applications that require higher head or more flow. Designed around Liberty's unique "Uni-Body" casting, the 280-Series will provide years of reliable performance.

All Models Feature:

- Vortex style impeller permitting passage of solids up to ¾"
- 416 stainless steel rotor shaft
- Permanently lubricated upper and lower ball bearing
- Epoxy powder coat finish
- All fasteners – corrosion-resistant stainless steel
- 1½" Discharge
- Stainless steel bottom screen – easily removable
- Maximum fluid temperature: 140° F.
- **280-Series Cord Lengths**

Model	10'	25'(-2)	35'(-3)	50'(-5)
280	Standard	Optional	Optional	Optional
281	Standard	Optional	Optional	Optional
283	Standard	Optional	Optional	N/A
287	Standard	Optional	N/A	N/A

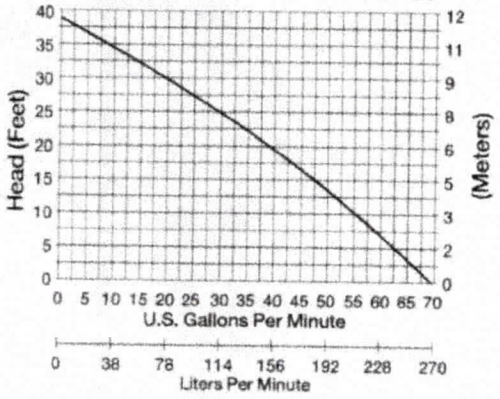
10' cord length standard on all models. For optional lengths, add "-2, -3 or -5" suffix to model number.
Example: for model 280 with 35' cord, order 280-3

Motor Specifications

½ hp 60 Hz 3450 RPM
Oil filled, thermally protected

115 V. Models 8.5 amps
208/230 V. Models 4.6 amps

Performance Curve: 280-Series



Dimensional Data:

Weight: 29 lbs.
Height: 13"
Major Width: 10" (model 287)

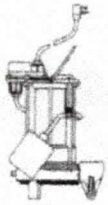
Minimum Sump Diameters:

Model 281, 283...14"
Model 287 VMF...10"

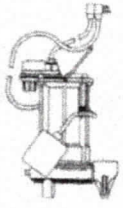
Factory switch settings	Model 281, 283	Model 287 VMF
Turn on level	13"	9.5"
Turn off level	7"	4.0"

The Model 283 features a fully adjustable wide-angle float. Differential adjustments can be made easily by tethering the float to the discharge pipe or other mounting point. Vertical float model 287 is not adjustable.

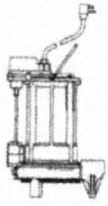
Model 280
Manual, no switch



Model 281
Wide angle float switch with quick-disconnect



Model 283
Wide angle float switch with series (piggy-back) plug



Model 287 VMF-Series
Vertical magnetic float for smaller pits – will operate in a 10" diameter sump

SSPMA Certified Member

C US Certified

Specifications are subject to change without notice.

Liberty Pumps • 7000 Apple Tree Avenue • Bergen, New York 14416 • Phone 800-543-2550 Fax (585) 494-1839
www.libertypumps.com

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Note 8

There is no location showing this on the plan, a location will be decided in coordination with the electrical company. A 22 KW generator with a 500 gallon LP tank will be installed. This generator will run selected items including:

These items may not all run at the same time and will be turned on in this order of priority

PLC controls
2 lift station pumps one for each lift station (VFD)
1 recirculation pump (VFD)
1 drip pump

This generator has an automatic start and a transfer switch and will test run once each week to maintain readiness. Each time the generator runs, a text is sent to utility employees so they know it is working.

[redacted]

16/20/22 kW

[redacted]

GENERAC

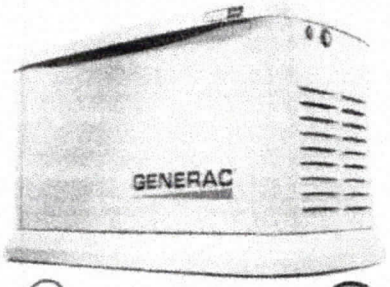
GUARDIAN® SERIES
Residential Standby Generators
Air-Cooled Gas Engine

INCLUDES:

- ☐ True Power™ Electrical Technology
- ☐ Two Line LCD Multilingual Digital Evolution™ Controller (English/Spanish/French/Portuguese)
- ☐ Two Transfer Switch Options Available: 100 Amp, 16 Circuit Switch or 200 Amp Service Rated Smart Switch. See Page 5 for Details
- ☐ Electronic Governor
- ☐ Standard Wi-Fi™ Remote Monitoring
- ☐ System Status & Maintenance Interval LED Indicators
- ☐ Sound Attenuated Enclosure
- ☐ Flexible Fuel Line Connector
- ☐ Direct-To-Dirt Composite Mounting Pad
- ☐ Natural Gas or LP Gas Operation
- ☐ 5 Year Limited Warranty
- ☐ Listed and Labeled by the Southwest Research Institute allowing installation as close as 18" (457 mm) to a structure.*

*Must be located away from doors, windows, and fresh air intakes and in accordance with local codes.
https://kassets.swri.org/library/DirectoryOfListedProducts/ConstructionIndustry/973_DoC_284_13284-01-01_Rev0.pdf

Standby Power Rating



c UL us LISTED QUIET TEST

Note: CUL certification only applies to unbundled units and units packaged with smaller circuit switches. Units packaged with the Smart Switch are UL certified in the USA only.

FEATURES

- ☐ INNOVATIVE ENGINE DESIGN & RIGOROUS TESTING are at the heart of Generac's success in providing the most reliable generators possible. Generac's G-Force engine lineup offers added peace of mind and reliability for when you need it the most. The G-Force series engines are purpose built and designed to handle the rigors of extended run times in high temperatures and extreme operating conditions.
- ☐ TRUE POWER™ ELECTRICAL TECHNOLOGY: Superior harmonics and pure wave form produce less than 5% Total Harmonic Distortion for utility quality power. This allows confident operation of sensitive electronic equipment and micro-chip based appliances such as variable speed HVAC systems.
- ☐ TEST CRITERIA:
  - PROTOTYPE TESTED
  - SYSTEM TORSIONAL TESTED
  - NEMA MG1-22 EVALUATION
  - MOTOR STARTING ABILITY
- ☐ MOBILE LINK™ REMOTE MONITORING: FREE with every Guardian Series Home standby generator. Allows you to monitor the status of your generator from anywhere in the world using a smartphone, tablet, or PC. Easily access information such as the current operating status and maintenance alerts. Connect your account to your authorized service dealer for fast, friendly and proactive service. With Mobile Link, you are taken care of before the next power outage.
- ☐ SOLID-STATE, FREQUENCY COMPENSATED VOLTAGE REGULATION: This state-of-the-art power monitoring regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine. Digital voltage regulation at +/-1%.
- ☐ SINGLE SOURCE SERVICE RESPONSE from Generac's extensive dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component.
- ☐ GENERAC TRANSFER SWITCHES: Long life and reliability are synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line includes its own transfer systems and controls for total system compatibility.

THE GENERAC PROMISE

GENERAC

16/20/22 kW

features and benefits

Engine	
☐ Generac G-Force design	Maximizes engine "breathing" for increased fuel efficiency. Plateau honed cylinder walls and plasma moly rings helps the engine run cooler, reducing oil consumption resulting in longer engine life.
☐ "Spiny-lok" cast iron cylinder walls	Rigid construction and added durability provide long engine life.
☐ Electronic ignition/spark advance	These features combine to assure smooth, quick starting every time.
☐ Full pressure lubrication system	Pressurized lubrication to all vital bearings means better performance, less maintenance and longer engine life. Now featuring up to a 2 year/200 hour oil change interval.
☐ Low oil pressure shutdown system	Shutdown protection prevents catastrophic engine damage due to low oil.
☐ High temperature shutdown	Prevents damage due to overheating.
Generator	
☐ Revolving field	Allows for a smaller, light weight unit that operates 25% more efficiently than a revolving armature generator.
☐ Skewed stator	Produces a smooth output waveform for compatibility with electronic equipment.
☐ Displaced phase excitation	Maximizes motor starting capability.
☐ Automatic voltage regulation	Regulates the output voltage to ± 1% prevents damaging voltage spikes.
☐ UL 2200 listed	For your safety.
Transfer Switch (if applicable)	
☐ Fully automatic	Transfers your vital electrical loads to the energized source of power.
☐ NEMA 3R	Can be installed inside or outside for maximum flexibility.
☐ Remote mounting	Mounts near your existing distribution panel for simple, low-cost installation.
Evolution™ Controller	
☐ Auto/Manual/Off illuminated buttons	Selects the operating mode and provides easy, at-a-glance status indication in any condition.
☐ Two-line LCD multilingual display	Provides homeowners easily visible logs of history, maintenance and events up to 50 occurrences.
☐ Sealed, raised buttons	Smooth, weather-resistant user interface for programming and operations.
☐ Utility voltage sensing	Constantly monitors utility voltage, setpoints 65% dropout, 80% pick-up, of standard voltage.
☐ Generator voltage sensing	Constantly monitors generator voltage to ensure the cleanest power delivered to the home.
☐ Utility interrupt delay	Prevents nuisance start-ups of the engine, adjustable 2-1500 seconds from the factory default setting of five (5) seconds by a qualified dealer.
☐ Engine warm-up	Ensures engine is ready to assume the load, setpoint approximately 5 seconds.
☐ Engine cool-down	Allows engine to cool prior to shutdown, setpoint approximately 1 minute.
☐ Programmable exercise	Operates engine to prevent oil seal drying and damage between power outages by running the generator for 5 minutes every other week. Also offers a selectable setting for weekly or monthly operation providing flexibility and potentially lower fuel costs to the owner.
☐ Smart battery charger	Delivers charge to the battery only when needed at varying rates depending on outdoor air temperature. Compatible with lead acid and AGM style batteries.
☐ Main line circuit breaker	Protects generator from overload.
☐ Electronic governor	Maintains constant 60 Hz frequency.
Unit	
☐ SAE weather protective enclosure	Sound attenuated enclosures ensure quiet operation and protection against mother nature, withstanding winds up to 150 mph. Hinged key locking roof panel for security. Lift-out front for easy access to all routine maintenance items. Electrostatically applied textured epoxy paint for added durability.
☐ Enclosed critical grade muffler	Quiet, critical grade muffler is mounted inside the unit to prevent injuries.
☐ Small, compact, attractive	Makes for an easy, eye appealing installation, as close as 18" (457 mm) away from a building.

GENERAC

16/20/22 kW

features and benefits

Installation System

☐ 1 ft (305 mm) flexible fuel line connector	Absorbs any generator vibration when connected to rigid pipe
☐ Direct-to-dirt composite mounting pad	Compact lattice design prevents settling or sinking of the generator system
☐ Integral sediment trap	Prevents particles and moisture from entering the fuel regulator and engine, prolonging engine life

Remote Monitoring

☐ Ability to view generator status	Monitor your generator via your smartphone, tablet, or computer at any time via the Mobile Link application for complete peace of mind
☐ Ability to view generator Exercise/Run and Total Hours	Review the generator's complete protection profile for exercise hours and total hours
☐ Ability to view generator maintenance information	Provides maintenance information for your specific model generator when scheduled maintenance is due
☐ Monthly report with previous month's activity	Detailed monthly reports provide historical generator information
☐ Ability to view generator battery information	Built-in battery diagnostics displaying current state of the battery
☐ Weather information	Provides detailed local ambient weather conditions for generator location

GENERAC

16/20/22 kW

specifications

Generator

Model	G007035-1, G007036-1, G007037-1 (16 kW)	G007038-1, G007039-1 (20 kW)	G007042-2, G007043-2 (22 kW)
Rated Maximum Continuous Power Capacity (LP)	16,000 Watts*	20,000 Watts*	22,000 Watts*
Rated Maximum Continuous Power Capacity (NG)	16,000 Watts*	18,000 Watts*	19,500 Watts*
Rated Voltage	240	240	240
Rated Maximum Continuous Load Current - 240 Volts (LP/NG)	66.7 / 66.7	83.3 / 75.0	91.7 / 81.3
Total Harmonic Distortion	Less than 5%	Less than 5%	Less than 5%
Main Line Circuit Breaker	70 Amp	90 Amp	100 Amp
Phase	1	1	1
Number of Rotor Poles	2	2	2
Rated AC Frequency	60 Hz	60 Hz	60Hz
Power Factor	1.0	1.0	1.0
Battery Requirement (not included)	12 Volts, Group 26R 540 CCA Minimum or Group 35AGM 650 CCA Minimum		
Unit Weight (lbs/kg)	409 / 186	448 / 203	466 / 211
Dimensions (L x W x H) in/mm	48 x 25 x 29 / 1,218 x 638 x 732		
Sound output in dB(A) at 23 ft (7 m) with generator operating at normal load**	67	67	67
Sound output in dB(A) at 23 ft (7 m) with generator in Quiet-Test™ low-speed exercise mode**	55	55	57
Exercise duration	5 min	5 min	5 min

Engine

Type of Engine	GENERAC G-Force 1000 Series		
Number of Cylinders	2	2	2
Displacement	999 cc	999 cc	999 cc
Cylinder Block	Aluminum w/ Cast Iron Sleeve		
Valve Arrangement	Overhead Valve	Overhead Valve	Overhead Valve
Ignition System	Solid-state w/ Magneto	Solid-state w/ Magneto	Solid-state w/ Magneto
Governor System	Electronic	Electronic	Electronic
Compression Ratio	9.5:1	9.5:1	9.5:1
Starter	12 VDC	12 VDC	12 VDC
Oil Capacity Including Filter	Approx. 1.9 qt / 1.8 L	Approx. 1.9 qt / 1.8 L	Approx. 1.9 qt / 1.8 L
Operating rpm	3,600	3,600	3,600
Fuel Consumption			
Natural Gas ft³/hr (m³/hr)			
1/2 Load	218 (6.17)	204 (5.78)	228 (6.46)
Full Load	309 (8.75)	301 (8.52)	327 (9.26)
Liquid Propane ft³/hr (gal/hr) [l/hr]			
1/2 Load	74 (2.03) [7.70]	87 (2.37) [8.99]	92 (2.53) [9.57]
Full Load	107 (2.94) [11.11]	130 (3.56) [13.48]	142 (3.90) [14.77]

Note: **Fuel pipe must be sized for full load.** Required fuel pressure to generator fuel inlet at all load ranges - 3.5-7" water column (7-13 mm mercury) for natural gas, 10-12" water column (19-22 mm mercury) for LP gas. For BTU content, multiply ft³/hr x 2500 (LP) or ft³/hr x 1000 (NG). For Megajoule content, multiply m³/hr x 93.15 (LP) or m³/hr x 37.26 (NG).

Controls

Two-Line Plain Text Multilingual LCD Display	Simple user interface for ease of operation
Mode Buttons: Auto	Automatic Start on Utility failure. 7 day exerciser
Manual	Start with starter control, unit stays on. If utility fails, transfer to load takes place
Off	Stops unit. Power is removed. Control and charger still operate
Ready to Run/Maintenance Messages	Standard
Engine Run Hours Indication	Standard
Programmable start delay between 2-1500 seconds	Standard (programmable by dealer only)
Utility Voltage Loss/Return to Utility Adjustable (Brownout Setting)	From 140-171 V / 190-216 V
Future Set Capable Exerciser/Exercise Set Error Warning	Standard
Run/Alarm/Maintenance Logs	50 Events Each
Engine Start Sequence	Cyclic cranking: 16 sec on, 7 rest (90 sec maximum duration)
Starter Lock-out	Starter cannot re-engage until 5 sec after engine has stopped
Smart Battery Charger	Standard
Charger Fault/Missing AC Warning	Standard
Low Battery/Battery Problem Protection and Battery Condition Indication	Standard
Automatic Voltage Regulation with Over and Under Voltage Protection	Standard
Under-Frequency/Overload/Stepper Overcurrent Protection	Standard
Safety Fused/Fuse Problem Protection	Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown	Standard
Overcrank/Overspeed (@ 72 Hz)/rpm Sense Loss Shutdown	Standard
High Engine Temperature Shutdown	Standard
Internal Fault/Incorrect Wiring Protection	Standard
Common External Fault Capability	Standard
Field Upgradable Firmware	Standard

** Sound levels are taken from the front of the generator. Sound levels taken from other sides of the generator may be higher depending on installation parameters. Rating definitions - Standby: Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. [illegible] * Maximum wattage and current are subject to and limited by such factors as fuel Btu/megajoule content, ambient temperature, altitude, engine power and condition, etc. Maximum power decreases about 3.5 percent for each 1,000 feet (304.8 meters) above sea level; and also will decrease about 1 percent for each 6 °C (10 °F) above 16 °C (60 °F).

GENERAC

16/20/22 kW

switch options

Limited Circuits Switch Features

- ☐ 16 space, 24 circuit, breakers not included.
- ☐ Electrically operated, mechanically-held contacts for fast, positive connections.
- ☐ Rated for all classes of load, 100% equipment rated, both inductive and resistive.
- ☐ 2-pole, 250 VAC contactors.
- ☐ 30 milliscond transfer time.
- ☐ Dual coil design.
- ☐ Rated for both copper and aluminum conductors.
- ☐ Main contacts are silver plated or silver alloy to resist welding and sticking.
- ☐ NEMA/UL 3R aluminum outdoor enclosure allows for indoor or outdoor mounting flexibility.
- ☐ Multi listed for use with 1" standard, tandem, GFCI and AFCI breakers from Siemens, Murray, Eaton and Square D for the most flexible and cost effective install.

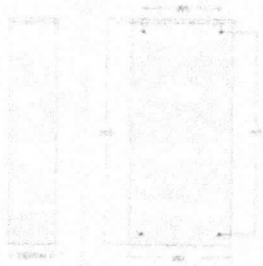
Model	G007036-1 (16kW)
No. of Poles	2
Current Rating (Amps)	100
Voltage Rating (VAC)	120 / 240, 1Ø
Utility Voltage Monitor (Fixed)*	
Pick-up	80%
Dropout	65%
Return to Utility*	approx. 15 sec
Exercises bi-weekly for 5 minutes*	Standard
UL Listed	Standard
Total Circuits Available	24
Tandem Breaker Capabilities	8 tandems
Circuit Breaker Protection	
Assembly IMPS Symmetrical Fault Current @ 250 Volts	10,000

*Function of Evolution Controller
Exercise can be set to weekly or monthly

Dimensions

	Height		Width		Depth
	H1	H2	W1	W2	
in	26.75	30.1	10.5	13.5	6.91
mm	679.4	764.3	266.7	343.0	175.4

Wire Ranges		
Conductor Lug	Neutral Lug	Ground Lug
1/0 - #14	2#6 - #14	2#6 - #14



Service Rated Smart Switch Features

- ☐ Includes Digital Power Management Technology standard (DPM).
- ☐ Intelligently manages up to four air conditioner loads with no additional hardware.
- ☐ Up to four more large (240 VAC) loads can be managed when used in conjunction with Smart Management Modules (SMMs).
- ☐ Electrically operated, mechanically-held contacts for fast, clean connections.
- ☐ Rated for all classes of load, 100% equipment rated, both inductive and resistive.
- ☐ 2-pole, 250 VAC contactors.
- ☐ Service equipment rated, dual coil design.
- ☐ Rated for both aluminum and copper conductors.
- ☐ Main contacts are silver plated or silver alloy to resist welding and sticking.
- ☐ NEMA/UL 3R aluminum outdoor enclosure allows for indoor or outdoor mounting flexibility.

Model	G007037-1 (16 kW)/G007039-1 (20 kW)/ G007043-2 (22 kW)
No. of Poles	2
Current Rating (Amps)	200
Voltage Rating (VAC)	120/240, 1Ø
Utility Voltage Monitor (Fixed)*	
Pick-up	80%
Dropout	65%
Return to Utility*	approx. 15 sec
Exercises bi-weekly for 5 minutes*	Standard
UL Listed	Standard
Enclosure Type	NEMA/UL 3R
Circuit Breaker Protection	22,000
Lug Range	250 MCM - #6

*Function of Evolution Controller
Exercise can be set to weekly or monthly

Dimensions

	200 Amps 120/240, 1ø Open Transition Service Rated				
	Height		Width		Depth
	H1	H2	W1	W2	
in	26.75	30.1	10.5	13.5	6.91
mm	679.4	764.3	266.7	343.0	175.4

GENERAC

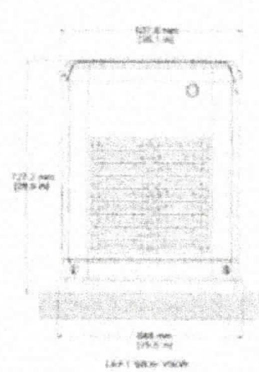
16/20/22 kW

available accessories

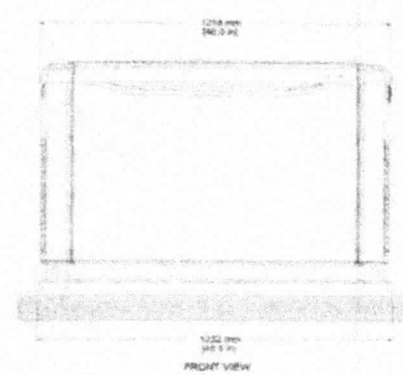
Model #	Product	Description
G007005-0	Wi-Fi LP Fuel Level Monitor	The Wi-Fi enabled LP fuel level monitor provides constant monitoring of the connected LP fuel tank. Monitoring the LP tank's fuel level is an important step in making sure your generator is ready to run during an unexpected power failure. Status alerts are available through a free application to notify when your LP tank is in need of a refill.
G005819-0	26R Wet Cell Battery	Every standby generator requires a battery to start the system. Generac offers the recommended 26R wet cell battery for use with all air-cooled standby product (excluding PowerPact®).
G007101-0	Battery Pad Warmer	The pad warmer rests under the battery. Recommended for use if the temperature regularly falls below 0 °F (-18 °C). (Not necessary for use with AGM-style batteries)
G007102-0	Oil Warmer	Oil warmer slips directly over the oil filter. Recommended for use if the temperature regularly falls below 0 °F (-18 °C).
G007103-1	Breather Warmer	The breather warmer is for use in extreme cold weather applications. For use with Evolution controllers only in climates where heavy icing occurs.
G005621-0	Auxiliary Transfer Switch Contact Kit	The auxiliary transfer switch contact kit allows the transfer switch to lock out a single large electrical load you may not need. Not compatible with 50 amp pre-wired switches.
G007027-0 - Bisque	Fascia Base Wrap Kit (Standard on 22 kW)	The fascia base wrap snaps together around the bottom of the new air cooled generators. This offers a sleek, contoured appearance as well as offering protection from rodents and insects by covering the lifting holes located in the base.
G005703-0 - Bisque	Paint Kit	If the generator enclosure is scratched or damaged, it is important to touch up the paint to protect from future corrosion. The paint kit includes the necessary paint to properly maintain or touch up a generator enclosure.
G006485-0	Scheduled Maintenance Kit	Generac's scheduled maintenance kits provide all the hardware necessary to perform complete routine maintenance on a Generac automatic standby generator.
G006873-0	Smart Management Module (50 Amps)	Smart Management Modules are used in conjunction with the Automatic Transfer Switch to increase its power management capabilities. It provides additional power management flexibility not found in any other power management system.

dimensions & UPCs

Dimensions shown are approximate. Refer to installation manual for exact dimensions. DO NOT USE THESE DIMENSIONS FOR INSTALLATION PURPOSES.



LEFT SIDE VIEW



FRONT VIEW

Model	UPC
G007035-1	696471074161
G007036-1	696471074154
G007037-1	696471074178
G007038-1	696471074185
G007039-1	696471074192
G007042-2	696471074208
G007043-2	696471074215

GENERAC

Generac Power Systems, Inc. • S45 W29290 HWY. 59, Waukesha, WI 53189 • generac.com


Untitled Map
Write a description for your map.
Legend
ury County
Will Brown Rd
Ollie Chunn Rd
SITE
Robe Robertson Rd
431
Google Earth
© 2018 Google
N
1000 ft

CONTRACT AGREEMENT

THIS AGREEMENT made as of the eighth day of August in the year of 2018.

Between Parties:
Cole Investments, LLC ("Owner")
1725 South Rutherford Blvd
Murfreesboro, TN 37130

and

Advanced Septic, Inc. ("Contractor")
3350 Galts Road
Acworth, Georgia 30102

and

Aqua Green Utility Inc. ("Utility")
3350 Galts Road
Acworth Georgia 30102

For the following Project:

Flat Creek Development Project ("Project")

1. Scope of Work ("Work")

This Scope of Work ("Work") will include design drawings submitted to Contractor's engineering firm for final approval to standards necessary for the State of Tennessee to allow permitting of the sewage disposal system. The Utility will apply for and acquire a necessity and convenience permit. The Contractor will build a sewage treatment system with a capacity sufficient to be used in connection with 108 home sites and up to 15 commercial lots and otherwise compatible of meeting the Tennessee Department of Environment and Conservation (TDEC) requirements and standards necessary for the disposal of wastewater for the Project that will consist of a treatment plant capable of 36,000 gallons per day. This plant and system will not provide sewage service for industrial waste. The sewage treatment plant will be located near the intersection of Will Brown Rd and Franklin Pike in Maury County Tennessee, As used herein, the term "Work" shall mean all of the construction which the contractor is required to perform under this Agreement and all documents in connection herewith, and shall include all labor, tools, construction means, construction equipment, materials, supplies, facilities, services, water, utilities, transportation and everything necessary or proper to do fully and complete the construction, whether temporary or permanent

Aqua Green Utility Inc. will be a permanent Utility and provide maintenance to this system once the system is online. The Utility will apply for a Certificate of Convenience & Necessity (CCN)

CONFIDENTIAL

and permits which will include posting the necessary financial surety for permanent operation with the Tennessee Public Utility Commission (TPUC). Once a State Operating Permit (SOP) has been acquired and all monies have been paid for the sewage system, the Utility will assume operation and responsibility with ownership of all components of the system and drip field property starting where the sewer line enters the septic tank at each property. The Owner agrees to transfer ownership of all land and easements used solely for access to the plant and the land where the plant is located for drip disposal fields and for all wastewater facilities, to the Utility. This shall take place once permits have been acquired and before work on facilities begins. If the contractor is unable to complete the construction of the facilities for any reason other than nonpayment, the land ownership and easements will be transferred back to the Owner. The Utility will bill the final customers monthly for this service at a rate set and approved by the TPUC. The Utility will request that TPUC approve the $5.75 per 1000 gallons, $90.00 minimum charge per month tariff amount for the commercial properties. The Utility will request that TPUC approve $44.53 per month tariff amount for the residential properties with completed homes and $120.00 per year for lots that are sold, but no home is built on them. The Utility will be responsible for all future costs including electricity, internet telemetry, sludge removal, septic tank pumping, parts replacements and certified operator visits.

The developer understands that a maximum sewage treatment capability exists due to restrictions of a TDEC 36,000 gallons per day permit limit. That being 300 gallons per day for each of the 108 home lots and 240 gallons per day for each of the 15 commercial lots. If additional flow is required and capability can be increased, there will be additional cost. Flows in excess of these limits will be cause for the utility to cease service to that customer. Customers who do not follow utility rules are subject to disconnection of service.

All approvals from TDEC, TPUC and the local county must be acquired for this contract to be completed.

Contractor shall comply with any and all applicable federal, state and local laws, rules, regulations, statues, codes, orders and ordinances relating to the performance and completion of the Work and all activities and obligations of Contractor under this Agreement.

The design criteria for the system effluent concentration shall meet the values set by TDEC.

The wastewater treatment plant will include complete automation of operation PLC controlled. This will be equipped to text and email the Utility's' technicians in case of a problem for quick reliable service.

All plant components will be solely owned by the Utility and will be the Utility's responsibility.

A secure control building to house electrical components and PLC controls is included.

All electrical and other equipment needed for main plant operation is included.

All associated plant and drip field engineering cost are included.

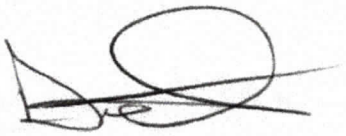
AquaGreen
Utility Inc.

To: Whom it may concern

The drawing format is something we are working with George Garden on. He has received a digital format. If for any reasons you need additional information, please let me know.

Below is our contact information.

Thank you for your time and consideration.



Dart Kendall
President Aqua Green Utility
865-908-0432
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State Operating Permit
Engineering Report

Flatt Creek Subdivision

Prepared For:
Aqua Green Utility Inc.

Prepared By:

FES Consulting
Bob Faulhaber - P.E.
October 1, 2018

Project Description

The project is a new, 123 lot subdivision in Maury County, TN. The property will include 108 residential lots and 15 small commercial lots. The property does not have access to public sewer.

Wastewater System Description

A decentralized wastewater system consisting of primary treatment in the form of a septic tanks at each lot and a combination of gravity flow sewer lines and pressure lines to transport the effluent to a secondary treatment system in the form of a fixed film trickle filter and drip dispersal. A description of each component and the conveyance method for the effluent between the components is included below. Further detail is provided on the attached drawings as well.

1. **Septic Tanks** – Each lot will have a 1,000 gallon water tight concrete septic tank. Waste water from each house (or commercial building) will flow by gravity to the septic tank via a PVC sanitary sewer pipe. Effluent from this tank will either flow by gravity or by pressure line, dependent on location, to secondary treatment (trickle filter). The gravity flow will be via a 4" PVC line to a drop Tee with a cleanout connecting to a common PVC line. Lots that are serviced by a pressure line will include a separate single compartment dosing tank after the septic tank with pumps to pump the effluent.

2. **Effluent Lines** – Effluent lines will be installed by others, but will be required by the utility to be Schedule 40 glued PVC. Effluent will be delivered to plant via two types of sewer lines, gravity or pressure. The gravity line will convey effluent directly to a pumping chamber that is located within the main dosing tank (see further description below) and pressure lines will convey effluent from two lift stations located in the subdivision directly to the trickle filter. The pressure lines will be powered by the suction side of two duplexed centrifuge pumps with Variable Frequency Drives (VFD). Additional descriptions are provided in the notes attached to the drawings.

3. **Dosing Tank** – The dosing tank will receive effluent from two locations; untreated effluent by gravity directly from septic tanks at the lots, and treated effluent from the trickle filter. The untreated effluent from the lots will enter into a pumping chamber (upright 24" concrete pipe) within the dosing tank, where it will be pumped by recirculation pumps to the trickle filter (by way of the lift pump control room). A ball valve will be located within the pumping chamber that will allow treated effluent (from the trickle filter) in the main chamber of the dosing tank to enter the pumping chamber for recirculation if the water level in the chamber drops below the ball valve. This will allow for recirculation through the trickle filter when the inflow of untreated effluent is low to maintain the wetting rate for the filter or when the operator determines that recirculation is needed for treatment. Treated effluent from the trickle filter will enter into the dosing tank by way of a 10" gravity line. From the dosing tank, effluent will be pumped to one of two locations, the drip fields or back to the trickle filter for recirculation (See below for descriptions). The priority and timing of this routing will be controlled by a PLC system that can be adjusted based on waste water flows, effluent quality and environmental conditions. The typical priority and descriptions of the pumping locations is provided below.

a. **Recirculate/circulate to the trickle filter** – Three pumps will be provided for recirculation in the pumping chamber, a duplex system of pumps and a solar pump. Treated effluent from the trickle filter will enter this pumping chamber for recirculation whenever the water level in the main tank exceeds the level in the pumping chamber. This will occur when the flow of effluent entering from the gravity lines is low and is exceeded by the pumping rate of the recirculation pumps or when the drip pumps are off or at a low flow condition. When effluent flow rates are high, from either or both gravity and pressure, the solar pump can provide additional pressure and flow through the standard nozzles or the high rate nozzles. Recirculation pumps will be on adjustable PLC controlled timers and also set to come on with the drip pumps to assure adequate recirculation rates.

b. **Drip Field** – Two Myers pumps are located within the main chamber of the dosing tank to pump to the drip field. When pumping to the drip fields the effluent line will split into three lines that are connected to three disk filters. These disk filters each have solenoid valves before them and a check valve. The filters block anything larger than about 130 micron. This is the size needed to protect the drip irrigation tubing. These filters automatically back flush, but should be checked once a year. There are solenoid valves connected to the bottom of the disk filters that are normally closed and used to back flush the filters either through the alternate pump screen or back to the sewer recirculation line. Next, the pipes tie together before passing through the flow meter. After the flow meter there is a normally open solenoid valve that is used during back flushing of the filters. Once the effluent leaves the control room it is pumped to the drip irrigation field. Treated effluent from the dosing tank will be pumped to a multi-zone drip field for final effluent treatment and application. A description of the details of the drip field is provided below.

c. Sludge will be pumped back to the 1000 gallon sludge storage tank by PLC controlled timer. Sludge will be removed by a septic tank pump truck and disposed of at an approved municipal plant.

4. **Secondary treatment -** The proposed secondary treatment system is an attached growth (fixed film), trickling filter. The trickle filter will utilize manufactured media. The media will be placed in a poured in place concrete chamber approximately 9' deep to form the attached growth (fixed film) treatment unit. The system will include a 1,080 CFM fan. Anticipated BOD loading of 36 pounds requires approximately 100 CFM. Following treatment the effluent will gravity flow through a 10" PVC line to the dosing tank.

5. **Drip Field** – The drip irrigation field is divided into zones and each zone has a solenoid valve to allow the effluent to enter the zone. The PLC has a timer set for each zone to control flow. Once in the soil, the microbes in the soil and plant uptake complete the treatment process. Each zone has air vacuum breaker vents at the high points of the zone, so when effluent drains at the end of a pump cycle the soil and debris will not be drawn into the drip tube emitters. Each zone is connected to a return line through a one way check valve that goes back to a valve box located outside the large valve. In the large valve box there is a normally closed solenoid valve in the return pipe connected to the lower sewer inlet line. Once the system has stopped pumping the valve opens and the

remaining effluent is returned to the sewer inlet line.

The drip field will utilize 0.61 GPH Netafim drip tubing installed in the mapped Sykes-Armour, Holston-Swafford and Holston-Swafford-Armour soils. Drip tubing will be installed at a depth of 10". The drip tubing will follow the ground contours to keep each line of drip tubing level and will be installed at 2' – 5' centers. The target spacing for the drip tubing will be 3' on center, but may be adjusted slightly to account for change in contour and slope (keeping the tubing level will take precedent over maintaining strict 3' spacing). Drip tube pacing will not exceed 5' (as required by Chapter 17 of the design guide) nor be less than 2 ft on center. Twelve zones will be set up for the drip fields, for a total of approximately 152,000 sf of soil.

Wastewater Flow

The wastewater flow rate is based on the TDEC standard 300 gpd/lot for residential use and 240 gpd/lot for office (commercial) use. When built out the subdivision will include 108 residential lots and 15 commercial lots for a total of 36,000 GPD.

Daily Flow - 36,000 GPD

Secondary Treatment System Design

Secondary treatment will be achieved through the use of a trickling filter. The trickling filter will utilize synthetic cross flow media. The media will be placed to a depth of 7' with a surface area of approximately 496 ft^2 and a volume of approximately 3,472 ft^3. The synthetic media will provide approximately 48 ft^2/ft^3 of filter surface area (compared to 15 ft^2/ft^3 for rock media) for a total effective treatment area of approximately 166,650 ft^2. The minimum hydraulic loading rate will be 73 GPD/ ft^2. **This places the system well within standard operating loading rates for industry standard low to standard rate trickling filters for municipal applications.** Data for the trickling filter is provided below.

Influent flow rate (max)	-	**36,000 GPD**
Influent BOD_5	-	**120 mg/L**
Filter Bed Area	-	**496 ft^2**
Specific Area of filter media	-	**48 ft^2/ft^3**
Filter volume	-	**3,472 ft^3**
Hydraulic Loading Rate*	-	**73 GPD/ft^2**
Organic Loading Rate**	-	**10 lb BOD_5/1000 ft^3-day**
Wetting Rate	-	**0.1 GPM/ft^2**

*based on no recirculation and filter bed surface area
**based on filter volume and 120 mg/l BOD (0.001 lb/g)

Energy Saving Features

The trickle filter process, especially when combined with media blocks instead of gravel, is a very efficient way to treat effluent. The chosen recirculating pumps are the high efficiency models available from the manufacturer for the intended purpose. Adjustable treatment nozzles allow reduced treatment volumes until all of the homes in the subdivision are built out. Finally, the chosen wobbler nozzles are capable of operating with very low pressures reducing the required pump energy for the spray nozzles. In addition, a solar pump is provided for recirculation. The solar pump is in addition to standard recirculation pumps so will provide more efficient operation when possible, but the system does not depend on this pump for operation.

Soils

The Sykes-Armour, Holston-Swafford and Holston-Swafford-Armour soil series is the soil series that will be used for drip dispersion.

Wastewater Soil Loading

Hydraulic Loading Rate

The design hydraulic loading rate for the soil is 0.25 GPD/SF

Nitrate Loading Rate

The Nitrate Loading Rate was calculated using Equation 17-2 from TDEC's *Design Guidelines for Wastewater Dispersal Using Drip Irrigation*. The precipitation, potential evapotranspiration, nitrogen fraction removed by denitrification/volatilization, and the maximum nitrate concentration in the leachate are all taken from chapter 16 of the TDEC regulations. The Annual Uptake Rate for Crops is based on Hardwood trees, which will be planted in the drip field. A Spreadsheet with Nitrate Loading Calculations is attached to this report.

Lwn = 0.24 GPD/SF (see attached spreadsheet)

Design/Controlling Loading Rate

The design loading rate and required soil area is shown below

Soil Type	Controlling Loading Rate	Design Flow Rate	Required Soil Area
Sykes-Armour, Holston-Swafford and Holston-Swafford-Armour	0.24 GPD/SF	36,000 GPD	150,000 SF

Wastewater Application Rates Based on Nitrate Concentration

Master

Nitrate Loading Rate = Lwn = (Cp)(Pr - PET) + U (4.424) / [(1-f)(Cn) - Cp] -- Eqn. 16-5

Lwn =		Calculated Allowable Nitrate Loading Rate
Pr =		Table A-3 of Chapter 16 - 5-year return monthly precipitation (in/month)
PET =		Table A-2 of Chapter 16 - Potential Evapotranspiration (in/month)
N-	**Uptake**	Table A-5 of Chapter 16 - Monthly Nitorgen Uptake Rate by Vegetation (lbs/acre/month)
f =		Applied Nitrogen Fraction Removed by Denitrification / Volatilization (%)
Cp =	10	Maximum Nitrate Concentration in Leachate (mg/L)
Cn =	23	Nitrogen Concentration in Applied Wastewater (mg/L)
	4.424	Conversion Factor
U =	250	Annual Nitrogen Uptake Rate for Crop, Variable (lbs/acre/yr)

MONTH	Pr in/mo	PET in/mo	N Uptake %/mo	N Uptake lb/ac/mo	f (Denitrif) %/mo	Lwn in/mo	Lwn in/wk	Lwn in/day	Lwn GPD/SF	Lwh GPD/SF
JAN	7.62	0.10	1%	3	25%	11.90	2.69	0.38	0.24	
FEB	6.72	0.27	2%	5	25%	11.95	2.99	0.43	0.27	
MAR	8.85	0.97	4%	10	27%	18.12	4.09	0.58	0.36	
APR	6.59	2.30	8%	20	29%	20.76	4.84	0.69	0.43	
MAY	6.13	3.59	12%	30	31%	26.94	6.08	0.87	0.54	
JUN	5.52	4.90	15%	38	33%	31.81	7.42	1.06	0.66	
JUL	6.85	5.44	17%	43	35%	40.83	9.22	1.32	0.82	
AUG	4.73	5.00	15%	38	35%	32.97	7.44	1.06	0.66	
SEP	5.54	3.79	12%	30	34%	29.00	6.77	0.97	0.60	
OCT	4.47	1.98	8%	20	32%	20.10	4.54	0.65	0.40	
NOV	6.11	0.82	4%	10	29%	15.35	3.58	0.51	0.32	
DEC	7.55	0.27	2%	5	26%	13.52	3.05	0.44	0.27	
TOTALS	**76.68**	**29.43**	**100%**	**250**		**273.24**			0.24	

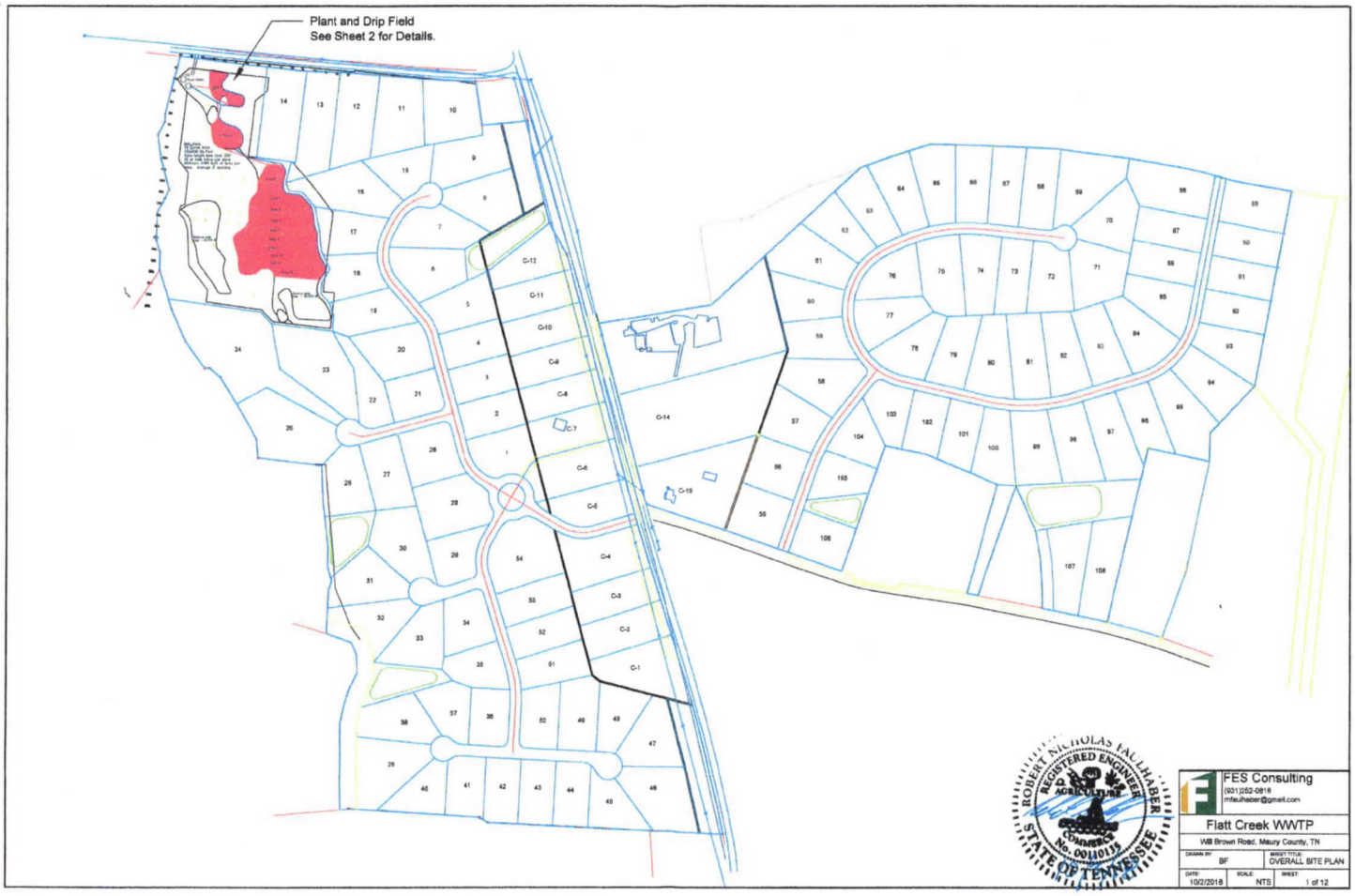
Project	Flatt Creek Subdivision

Fluid Properties	
Specific Gravity	1
Density	62.4
g	32.2

									Fittings								
Description	Pipe Size	Area	C	Static Head	Pipe Length (ft)	Flow (gpm)	Velocity (ft/s)	Friction Loss	90 ell	tee	Gate valve	coupling	Eq. length	Minor Loss	TDH (ft)	Head Loss	
Dosing to control	2	0.02	150	10	50	70	7.32	4.60	0	0	0	2	26	2.58	17	7.45	psi
Control to sprayers	3	0.05	150	5	50	70	3.25	0.64	1	0	0	2	46	0.94	7	2.86	psi
Sprayers															14		
														TOTAL	37.7592(		

Description	Pipe Size	Area	C	Static Head	Pipe Length (ft)	Flow (gpm)	Velocity (ft/s)	Friction Loss	90 ell	tee	Gate valve	coupling	Eq. length	Minor Loss	TDH (ft)	Head Loss
Lift station to control	4	0.09	150	15	5000	40	1.05	5.59	0	0	0	20	280	0.70	21	9.24
														TOTAL	21	

SEE COMPONENT SHEETS FOR DRIP ZONE HEAD LOSS CALULATIONS AND DRIP PUMP CALCS



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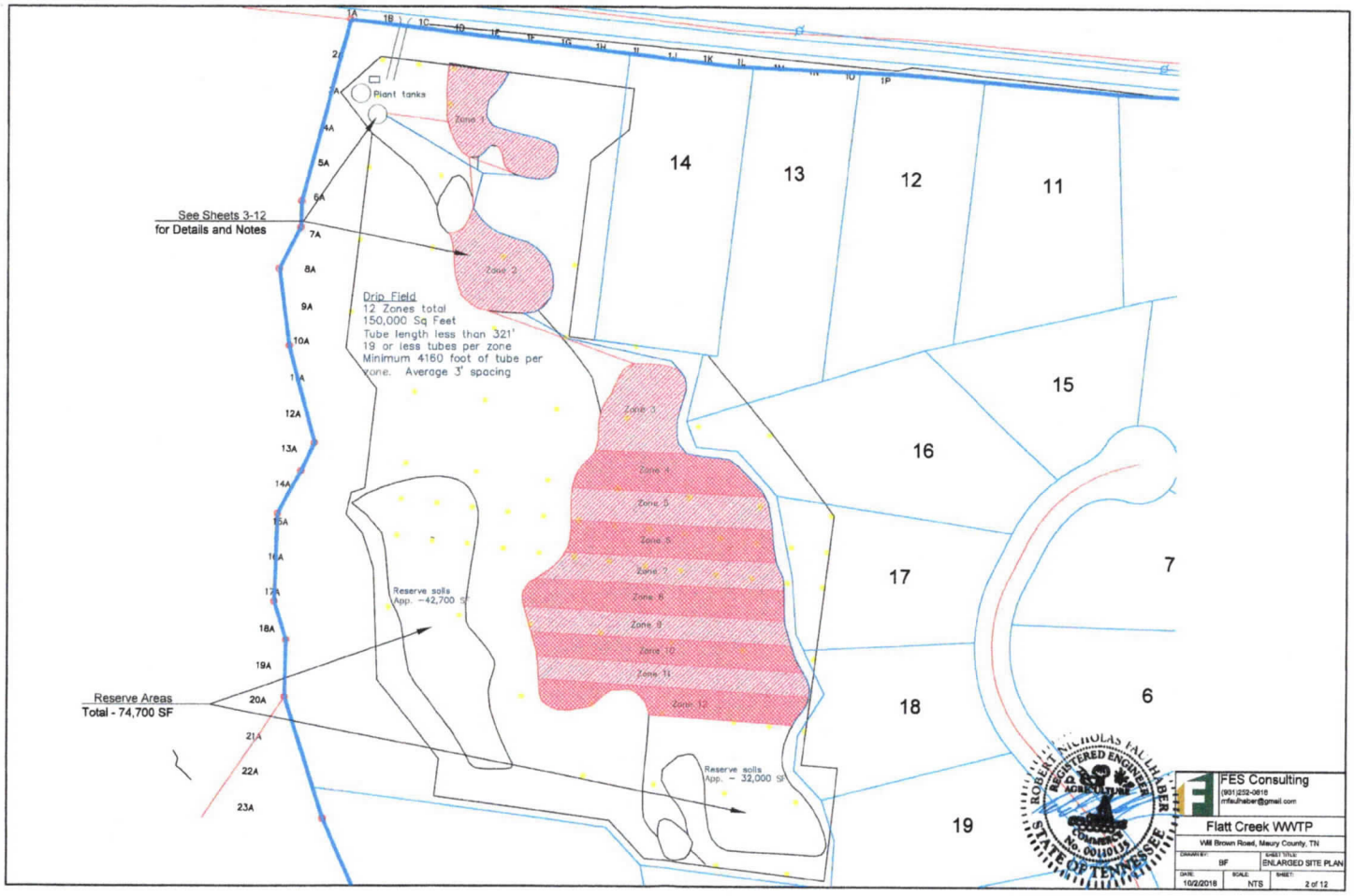
Flatt Creek WWTP
WB Brown Road, Maury County, TN

DRAWN BY:	SHEET TITLE:
BF	OVERALL SITE PLAN
DATE: 10/2/2018	SCALE: NTS
	SHEET: 1 of 12


Plant tanks
See Sheets 3-12
for Details and Notes
Drip Field
12 Zones total
150,000 Sq Feet
Tube length less than 321'
19 or less tubes per zone
Minimum 4160 foot of tube per zone. Average 3' spacing
Reserve soils
App. -42,700 SF
Reserve soils
App. - 32,000 SF
Reserve Areas
Total - 74,700 SF
Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
Zone 7
Zone 8
Zone 9
Zone 10
Zone 11
Zone 12
11
12
13
14
15
16
17
18
19
6
7
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Will Brown Road, Maury County, TN
DRAWN BY: BF
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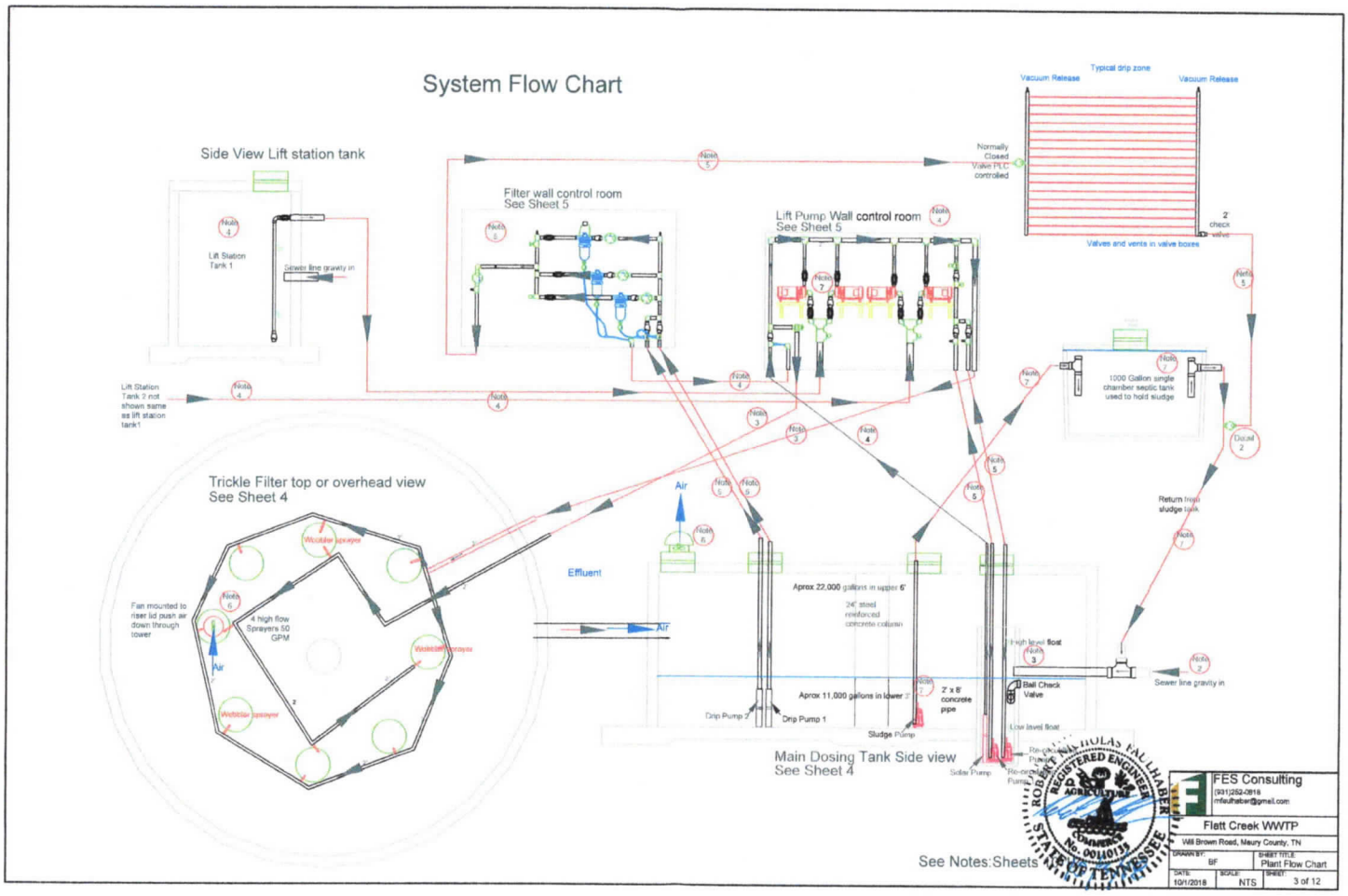
DATE: 10/2/2018
SCALE: NTS
SHEET: 2 of 12


System Flow Chart
Side View Lift station tank
Lift Station Tank 1
Sewer line gravity in
Filter wall control room
See Sheet 5
Lift Pump Wall control room
See Sheet 5
Typical drip zone
Vacuum Release
Vacuum Release
Normally Closed Valve PLC controlled
2" check valve
Valves and vents in valve boxes
1000 Gallon single chamber septic tank used to hold sludge
Lift Station Tank 2 not shown same as lift station tank1
Trickle Filter top or overhead view
See Sheet 4
Air
Effluent
Fan mounted to riser lid push air down through tower
4 high flow Sprayers 50 GPM
Webbilar sprayer
Aprox 22,000 gallons in upper 6'
24" steel reinforced concrete column
Aprox 11,000 gallons in lower 2'
2' x 8' concrete pipe
Drip Pump 2
Drip Pump 1
Sludge Pump
Solar Pump
High level float
Ball Check Valve
Low level float
Sewer line gravity in
Return from sludge tank
Main Dosing Tank Side view
See Sheet 4
See Notes:Sheets
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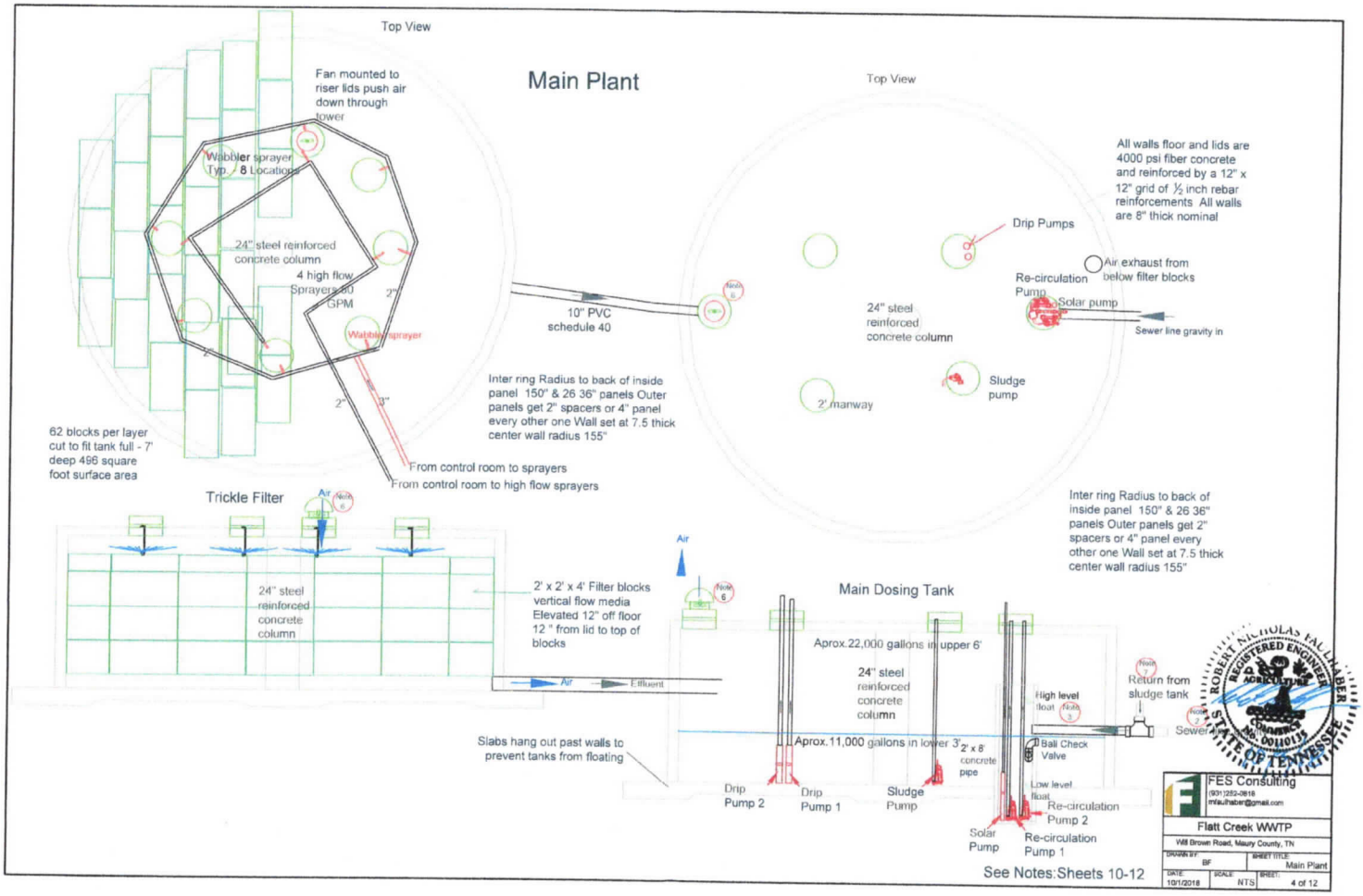
Flatt Creek WWTP
Will Brown Road, Maury County, TN
DRAWN BY: BF
SHEET TITLE: Plant Flow Chart
DATE: 10/1/2018
SCALE: NTS
SHEET: 3 of 12


Main Plant
Top View
Fan mounted to riser lids push air down through tower
Wabbler sprayer Typ. 8 Locations
24" steel reinforced concrete column
4 high flow Sprayers 30 GPM
2"
3"
Wabbler sprayer
From control room to sprayers
From control room to high flow sprayers
62 blocks per layer cut to fit tank full - 7' deep 496 square foot surface area
10" PVC schedule 40
Inter ring Radius to back of inside panel 150" & 26 36" panels Outer panels get 2" spacers or 4" panel every other one Wall set at 7.5 thick center wall radius 155"
Top View
All walls floor and lids are 4000 psi fiber concrete and reinforced by a 12" x 12" grid of ½ inch rebar reinforcements All walls are 8" thick nominal
Drip Pumps
Air exhaust from below filter blocks
Re-circulation Pump
Solar pump
Sewer line gravity in
24" steel reinforced concrete column
Sludge pump
2' manway
Inter ring Radius to back of inside panel 150" & 26 36" panels Outer panels get 2" spacers or 4" panel every other one Wall set at 7.5 thick center wall radius 155"
Trickle Filter
Air
24" steel reinforced concrete column
2' x 2' x 4' Filter blocks vertical flow media Elevated 12" off floor 12 " from lid to top of blocks
Air
Effluent
Main Dosing Tank
Aprox.22,000 gallons in upper 6'
24" steel reinforced concrete column
Aprox.11,000 gallons in lower 3'
2' x 8' concrete pipe
High level float
Return from sludge tank
Sewer
Ball Check Valve
Low level float
Slabs hang out past walls to prevent tanks from floating
Drip Pump 2
Drip Pump 1
Sludge Pump
Solar Pump
Re-circulation Pump 2
Re-circulation Pump 1
See Notes:Sheets 10-12
ROBERT NICHOLAS FALLAHEE
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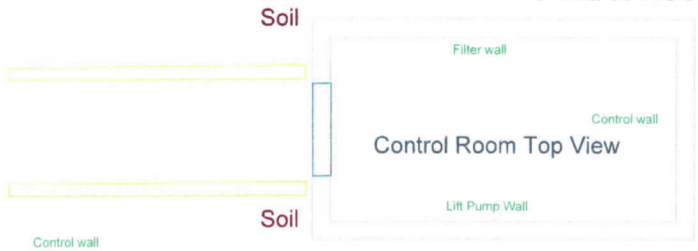
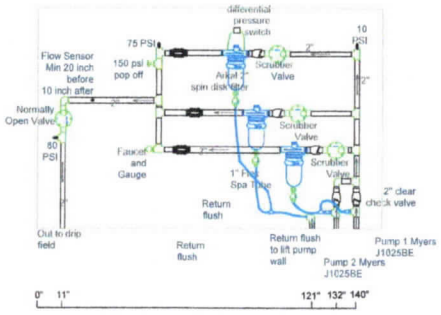
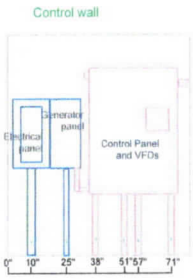
mfallahee@gmail.com
Flatt Creek WWTP
Will Brown Road, Maury County, TN
DRAWN BY: BF
SHEET TITLE: Main Plant
DATE: 10/1/2018
SCALE: NTS
SHEET: 4 of 12

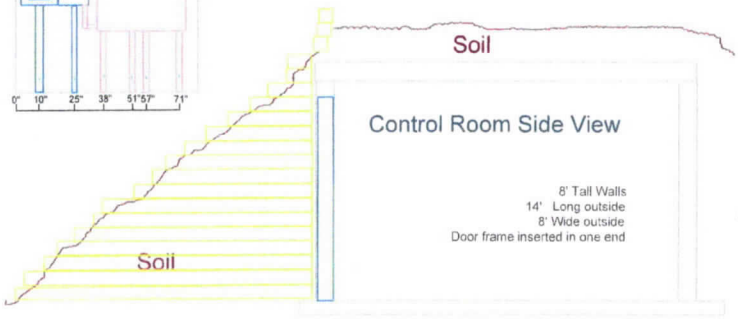
Control Room



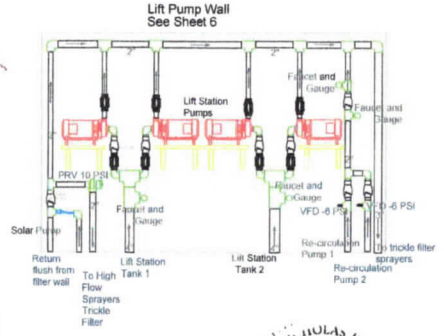
Filter Wall
See Sheet 7







Lift Pump Wall
See Sheet 6



See Notes Sheet 4

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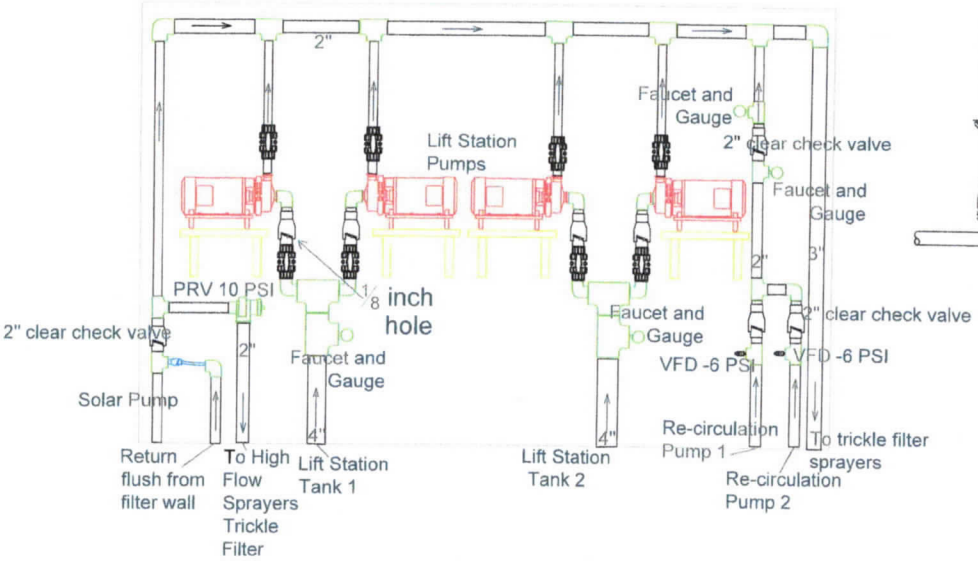
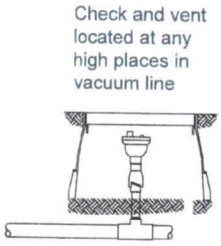
DATE: 10/1/2018	SCALE: NTS
	SHEET: 5 of 12

Lift Pump Wall





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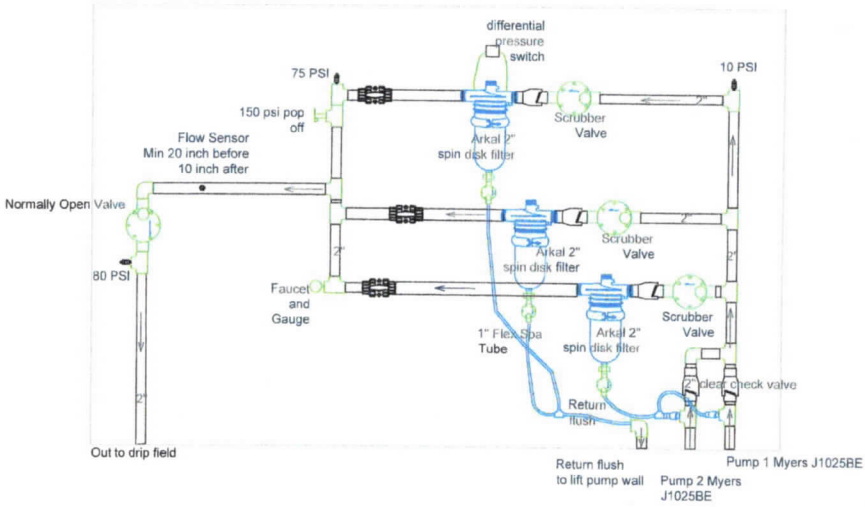
Filter wall



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DATE: 10/1/2018	SCALE: NTS
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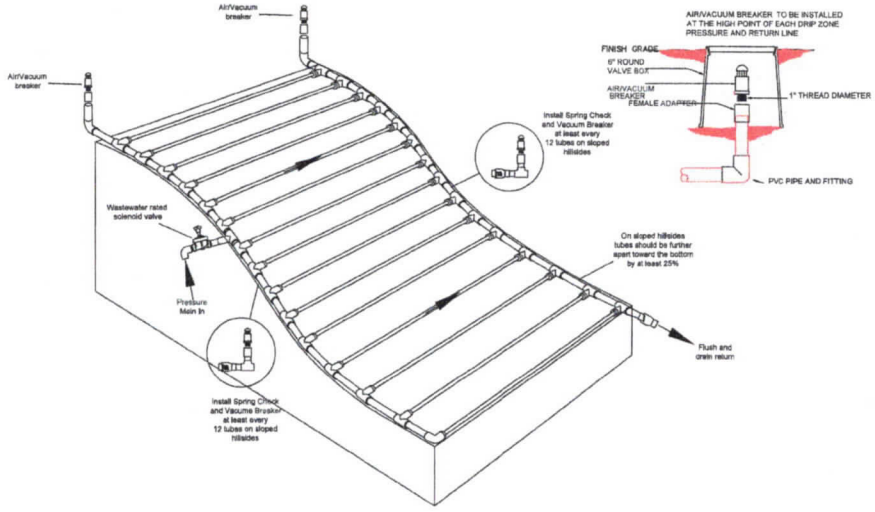

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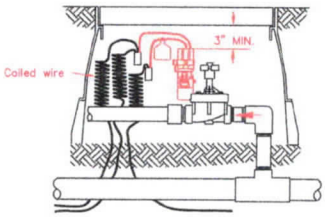
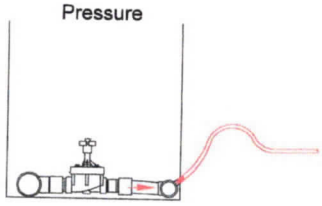
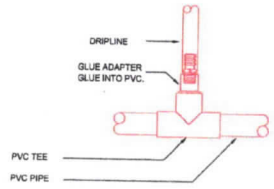
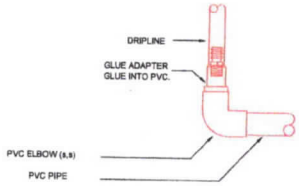
Solenoid valve



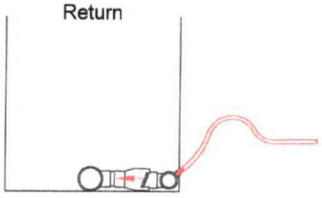
Pressure



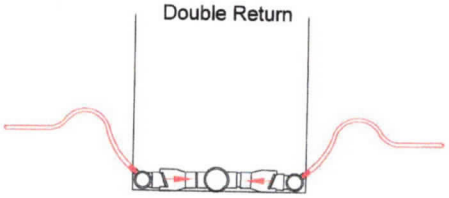


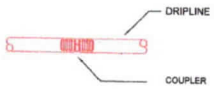


Return



Double Return





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Note 1
Each home or commercial site will be required to have a separate septic tank which follow utility requirements , there will be a combination of 2 possible types of tanks at any location, STEG or STEP.

The STEG tanks will be 1 piece concrete septic tank with 2 compartments. If necessary, a plastic tank may also be accepted. Each tank will have a sewer popper device that allows sewage to escape in case of a line failure, protecting the home from flooding. Use of 4 inch schedule 40 PVC pipe will be required. Each septic tank will have 2 Polylok risers to the surface. This allows easy access for the utility to service these tanks and prevents the homeowner from later building a structure over the tank by accident. The utility assumes all regular and emergency maintenance of these tanks. Each tank will have a septic tank filter restricting solids passage to 1/8 inch, protecting all downstream components. These tanks also serve as grease traps to protect treatment processes. Each tap will have a clean out access point where it enters the main line. This allows line location, quick access and the ability to isolate customers disposing of anything other than domestic sewage.

The STEP system will be used if a gravity flow from the septic tank is not practical. These systems contain all the features of the STEG tank, but with the addition of a 1 piece single chamber septic dosing tank with one Polylok riser to the surface. These tanks must also follow utility requirements which include: two pumps (Little Giant WE10G05P4-21) with 3 floats in each dosing tank with a small PLC control panel. The PLC at each home alternates the pumps. If after 5 hours of pumping the level in the tank has not fallen, the pump is considered bad and the second pump is turned on. A Yellow light is illuminated flashing a code that the pump is bad. A buzzer goes off asking the homeowner to call the utility for service. If the second pump does not lower the water level in the dosing tank, a second buzzer and red light lets the homeowner know that Immediate service is required.

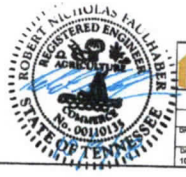
Note 2
The piping system that brings the sewage to the main plant will be installed by others, but it is required that a utility representative must inspect all components and installations. Schedule 40 PVC pipe with glued connections is required for all system components. All piping is to be bedded on gravel with a multi wire for future locating attached. This wire will also be used by the PLC to monitor lift station effluent levels and send alarms if needed. As each pipe is buried a warning sewer line buried tape is to be install just above the sewer line. Each tap location must have a clean out port for inspection and service.

Note 3
As sewage enters the plant from the STEG gravity lines it will first flow into a 24 inch cement upright pipe that serves as a pump chamber. The pipe will have a 4 inch ball check valve below normal water level in the main tank allowing main tank effluent to enter the pipe whenever sewage flow is less than pump requirements.

The two alternating recirculation pumps will be located here. The pumps will be Goulds WE1032H Pump with CV-2001_H1 Variable Frequency Drive (VFDd. The two recirculation pumps flow through 2" PVC schedule 40 pipe to the control room lift pump wall. If the high level float in the main dosing tank goes up, then the VFD will be turned on to full flow. If the low level float in the main dosing tank goes down, then the VFD will be turned off. If the floats are in the normal position, then the flow rate of the recirculation pumps will be controlled with a 4-20 pressure transducer just inside the control room. (See Lift Pump Wall) The transducers are set to 6 psi then out to the trickle filter sprayers. If the solar or either lift station pumps are flowing at a higher pressure, then the VFD will turn the active recirculation pump to idle. This feature is to conserve electrical energy.

The recirculation rate will be set by two methods :actively by the PLC control of time on and time off and passively by the size of wobbler spray nozzle and number of nozzles that are active. These settings are controlled by the operator to maximize efficiency and maintain effluent quality as the homes are built in the subdivision.

If flow to the trickle filter sprayers is greater than the nozzle and pump timer setting, a adjustable PRV (Pressure Relief Valve) will trip at 10 psi. This will allow flow to the high flow sprayers. These sprayers have large openings and are set to flow approximately 50 gallons per minute.



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Note 4

Lift stations in the subdivision operate on the vacuum side of two GT103 centrifugal pumps. These pumps will be equipped with a CV-2001_H1 Variable Frequency Drive (VFD) . Using the VFD will help soft start pumps when on generator back up. Those STEG systems tanks that cannot flow via gravity to the main plant and will flow to lift stations located in low areas. Each of these tanks will have a pipe that runs back to the main plant and be connected to two pairs of alternating pumps on the control room lift pump wall. There will be a check valve located in each tank to maintain prime. There also will be check valves in the control room. Each control room pump check valve will have a 1/8 inch hole that allows a small flow back to maintain prime. Each pipe from the lift station tanks will be equipped with a vent check valve to release air pressure and hold vacuum at any high points. If the pipe from the lift stations to the control room develops any air pockets this will purge the air from the pipe using the high pressure from the other pumps.

Not more than 50 homes or a total of 15,000 gallons per day will enter a lift station. With a 4 peaking factor of 60,000 gallons per day would be 41.6 gallons per minute flow. If a high level is detected with a float switch that will be in the lift station tank, both pumps would be activated. Additionally the PLC controls would send an alarm via text letting utility workers know there is a high flow situation. A low level float in the pump station will turn he pumps off when the effluent level is low.

Easements will be set aside to access lift station tank and electrical power available. If for any reason these lifts cannot be meet traditional powered lift pumps and backup generators will be installed and designed by others.

A solar pump will be added to this project to help increase efficiency and save energy cost. The addition of solar pumping is in addition to and not directly needed for plant operation. The pump is located in the main tank with the recirculation pumps (see note 3). A Grundfos 60 SQF-3 pump will be used, and max flow rate with full solar is expected to be 70 GPM. When solar power is available the pump will activate and pump through the 2 inch schedule 40 pipe from the main tank to the control room.

It is important to note that this pump has enough pressure to close off the recirculation pumps when set to 6 PSI or 13.8 foot of head, but not enough to stop flow from the lift pumps or recirculation pumps when they are at full power mode. This set up should maximize solar output without compromising regular pumping needs.

If flow to the trickle filter sprayers is greater than the nozzle and pump timer setting, an adjustable PRV (Pressure Relief Valve) will trip at 10 psi. This will allow flow to the high flow sprayers in the trickle filter. These sprayers have large openings and are set to flow about 50 gallons per minute.
The Return flush from filter wall pipe receives the back wash from the disk filters on the filter wall in the control room. The backwash will flow backwards to the solar pump and back wash the pump intake screen keeping it from clogging.

The solar panels will be ground based and set in two arrays, one facing South, South East and the other facing South, South West. This should maximize the daily sun output as simply as possible. Each array will use Mono Silicate type panels totaling more than 1400 watts for each array.

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Note 5
This wall in the control room is dedicated to the drip field filtering and pumping. There are two alternating PLC controlled pumps located in the main dosing tank (Myers J1025 BE-01). These pumps feed through 2 inch schedule 40 PVC pipe approximately 50 foot long. The flow to the drip field at normal rate will be 21.2 gallons per minute. There are 2083 emitters per zone at .61 gallons per hour for each emitter. During back flush, 27.6 GPM is needed. The PLC controls automatically brings both pumps online during back flush providing extra flushing. Our flow calculations are set to 27.6 gallons per minute.

As the effluent enters the filter wall, it passes two check valves then flows to the scrubber valves (Rain Bird BESBR 2"). These valves open when the PLC starts pumping to the drip field. There are 3 total filter lines to the drip field. If one of these lines stops up, the PLC will send an alert to utility personnel as determined by the pressure switches. The two remaining lines will provide ample flow to continue operations. Next, the effluent passes through the Arkal 130 micron 2 " disk filters. By closing and opening the solenoid valves, the PLC can back flush each disk filter to keep the filters clean and flowing. The disk filters are cleaned at the beginning of each pump cycle or any time the differential pressure switch activates showing clogging back pressure. The filters are back flushed with effluent filtered by the other two filters. During back flushing operations, the Normally Open solenoid valve is closed to maximize flush pressure. Effluent used for flushing is then sent to the non pumping drip pump or the solar pump to clear their intake screens. The solenoid valve before one filter is closed and the solenoid valve below the filter is opened for 20 seconds. Then the PLC moves on to the next filter line and so on.

After the filters, there is a flow meter in line that allows the PLC to keep track of how much effluent is pumped out to the drip field. There is a final PSI switch before the effluent goes out to the drip field that tells the PLC if a solenoid did not open at one of the zones when it was turned on. During the first 4 minutes of pumping, there is a solenoid valve that opens that flushes the drip tubing at 2 ft per second keeping it clean inside.

Note 6
Air supply will be provided by a down draft fan located on the trickle filter riser. A standard roof vent type fan will be used. The fan will be removed from its' housing then replaced in the down draft direction. The fan motor will be direct wired to a breaker in the control room and run at all times. A sensor will be installed to the PLC and an alarm will be sent to utility workers if the fan fails. If the #1 fan fails, a second fan set to exhaust and located on the main dosing tank will be switched on by the PLC. The 2nd fan, when idle, will serve as the exhaust for the air from the trickle filter. The air flow will travel down through the trickle filter through a 10 inch pipe from the trickle filter to the main dosing tank, then out the backup fan unit. This will give air to the trickle filter and stop gases from building up in the main dosing tank.
Each fan unit will be rated at 1080 CFM which is far in excess of what is required. The extra air flow should help make the process even more efficient.

Note 7
To maintain sludge removal without needing to stop plant treatment operations a sludge, removal pump will be located in the main dosing tank. The designed pumping rate is 45 GPM for 1 minute intervals. With several hours between pumping, this will give the sludge time to settle out in the sludge tank. A 2 inch schedule 40 PVC pipe approximately 100 foot long will go from the sludge pump to the sludge tank. A Liberty Model 281 pump has been selected and is an energy saving model. The Liberty 281 is also a normally stocked item for the utility. A tee will be located at the exit end of the septic tank and a schedule 40 4 inch PVC pipe. Which will flow by gravity back to the sewer line as it enters the main dosing tank.
The sludge tank will be a 1000 gallon single chamber septic tank. The tank will have a Polyloc riser located in the center of the lid. This lid will allow a septic tank pumper to be allowed to remove the sludge at a convenient location. Once removed the sludge will be transported to a proper disposal facility such as a municipal treatment plant.

Note 8
The location for the generator is not shown on the plan, a location will be decided in coordination with the electrical company. A 22 KW generator with a 500 gallon LP tank will be installed. This generator will run selected items including: (These items may not all run at the same time and will be turned on in this order of priority)

PLC controls
2 lift station pumps one for each lift station (VFD)
1 recirculation pump (VFD)
1 drip pump

This generator has an automatic start and a transfer switch and will test run once each week to maintain readiness. Each time the generator runs, a text is sent to utility employees so they know it is working.

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