IN THE TENNESSEE REGULATORY AUTHORITY
AT NASHVILLE, TENNESSEE

IN RE:	)	
	)	
PETITION OF TENNESSEE	)	
WASTEWATER SYSTEMS, INC., FOR	)	DOCKET NO. 14-00136
APPROVAL OF CAPITAL	)	
IMPROVEMENT SURCHARGES AND	)	
FINANCING ARRANGEMENTS	)	

SUPPLEMENT RESPONSES TO DISCOVERY REQUESTS FROM THE CONSUMER ADVOCATE

Tennessee Wastewater Systems, Inc. ("TWSI") submits the following supplemental responses to certain Discovery Requests from the Consumer Advocate:

SUPPLEMENTAL RESPONSE 2:

TWSI has provided the HOA President with a copy of the Petition which describes TWSI's proposal to allocate costs on a square foot basis. TWSI has also given the HOA President a spread sheet showing how much the allocation would be for each lot based on the assumption that the total project cost is $330,000. A copy of the spread sheet is attached.

Sq Footage	Location		Projected Allocation
2808	000000TNSUV0001	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0002	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0003	2551 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0004	2251 UPPER MIDDLE CREEK ROAD	8,592.00
3360	000000TNSUV0005	2251 UPPER MIDDLE CREEK ROAD	10,282.00
1920	000000TNSUV0006	2251 UPPER MIDDLE CREEK ROAD	5,875.00
2808	000000TNSUV0007	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0008	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0009	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0010	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0011	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0012	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0015	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0016	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0017	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0018	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0019	2251 UPPER MIDDLE CREEK ROAD	8,592.00
3360	000000TNSUV0020	2251 UPPER MIDDLE CREEK ROAD	10,282.00
1920	000000TNSUV0021	2251 UPPER MIDDLE CREEK ROAD	5,875.00
2808	000000TNSUV0022	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0023	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0024	2251 UPPER MIDDLE CREEK ROAD	8,592.00
7116	000000TNSUV0025	2251 UPPER MIDDLE CREEK ROAD	21,775.00
2808	000000TNSUV0026	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0027	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0028	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0030	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0031	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0032	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0034	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2808	000000TNSUV0035	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2736	000000TNSUV0036	2251 UPPER MIDDLE CREEK ROAD	8,372.00
2808	000000TNSUV0037	2251 UPPER MIDDLE CREEK ROAD	8,592.00
2916	Avg Sq Footage		
2916	Empty lot 13		8,923.00
2916	Empty lot 14		8,923.00
2916	Empty Lot 29		8,923.00
2916	Empty Lot 33		8,923.00
		Total Projected Cost	330,137.00

SUPPLEMENTAL RESPONSES 11-14:

Attached are TWSI's engineering plans for Summit View which were filed at TDEC on or about April 9, 2015. These plans provide additional support for the cost estimate prepared by Roy Denney and previously provided.

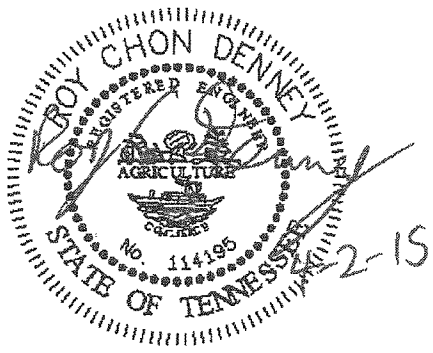
Adenus Solutions Group

849 Aviation Parkway
Smyrna, TN 37167

ENGINEERING REPORT

SUMMITT VIEW TF
DRIP FIELD - TREATMENT EXPANSION
FOR
SUMMITT VIEW RESORT
SEVIER COUNTY, TENNESSEE
SOP#: 06035

April 2, 2015



4-2-15

615.220.7200 www.adenus.com Fax: 615.220.7207

SUMMITT VIEW RESORT
TREATMENT FACILITY EXPANSION 2015
SEVIER COUNTY, TENNESSEE

Overview

Summitt View Resort has an existing Recirculating Sand Filter (RSF) treatment system with drip irrigation disposal (drip system). The existing RSF was designed for 0.008 MGD. Excessive guest capacity in the commercial rental units has caused the existing permitted flow to become inadequate for the needs of the resort during peak tourist dates. The purpose of this project is to construct a new RSF with an increased treatment capacity of ~0.01 MGD. The existing RSF (~0.008 MGD treatment capacity) will remain an integral part of this design. The drip system will be expanded to provide additional areas to dispose of the peak season flows. The expanded treatment system will use the existing drip system and an expanded drip system for disposal. The proposed sewerage system will have a new septic tank, an RSF, and a soils area for expanded drip disposal. A fence will added/installed for the existing drip soils, and the expanded drip soils.

Treatment Design Flow:	**= 17,500 GPD**
Rental Cabin Units	= 32 units
Original Design flow (GPD) per unit	= ~250 GPD
New Design flow (GPD) per unit	= ~550 GPD

This RSF will be designed @ 5.0 GPD/SF.

17,500 GPD / 5.0 GPD/SF	= 3,500 SF media area
Existing RSF:	
53 ft. X 30 ft.	= 1,590 SF media area
Expansion RSF:	
55 ft. X 30 ft.	= 1,925 SF media area

Total new designed treatment capacity:

1590 SF + 1925 SF	**= 3,515 SF media area total**

After leaving the proposed Rental Cabins, the effluent wastewater will be forced to the inlet riser of the New RSF. There will be storage chambers in the bottom of the RSF to serve as the recirculation chamber. The external recirculation chamber (1500 gallon wet well) will have submersible pumps that will force the effluent to the top of the RSF after it has traveled through the bottom of the RSF. The effluent will be distributed over the entire surface area of the RSF using the two pumps and a PVC distribution piping system.

During normal operation, the final discharge pumps will dispose of 20% of each recirculation cycle. The water will be pumped to the drip irrigation fields. The drip

irrigation fields will have automatic flushing capabilities, controlled by the HAWKOS panel. During periods of low, or no flows (when the water level in the recirculation side of the RSF falls below 8" in depth), the HAWKOS panel will turn "off" the final dose pumps and go into standby mode, until the water level in the recirculation side of the RSF returns (rises) to 8" in depth. All component locations, sizing, models, and configurations may be modified at the discretion of the engineer during construction of the system. Modifications will be noted on final As-built drawings, and will be provided to the Utility.

NEW RSF Pump Sizing

The New RSF will be designed in 4-2400 GPD zones. Each zone will have 7 laterals spaced at 15" on center, with 1/8" diameter orifices spaced at 15" on center. Therefore:

Lateral length	52.5 feet
Lateral diameter	1.25 inches
Lateral spacing	15 inches
Orifice spacing	15 inches
Orifice diameter	1/8 inch
Minimum flow rate per Orifice	0.75 gpm
Number of Orifice per zone	294 orifices
Number of Laterals per zone	7 laterals
Total actual flow rate (accounting for losses in lateral)	**224.5 GPM**
Losses:	
Minimum residual head at last orifice	**15 feet**
Transport pipe diameter	4 inches
Transport pipe length (pump to zone inlet)	60 feet
Losses in Transport pipe	2.5 feet/100 feet
Total Head loss in Transport pipe	**1.5 feet**
Lateral Distribution header diameter	3 inches
Total head loss in Distribution header	**0.1 feet**
Head loss elevation (pump to zone)	**2.5 feet**
Head loss in laterals	**2.4 feet**
Total Head losses	**21.5 feet**

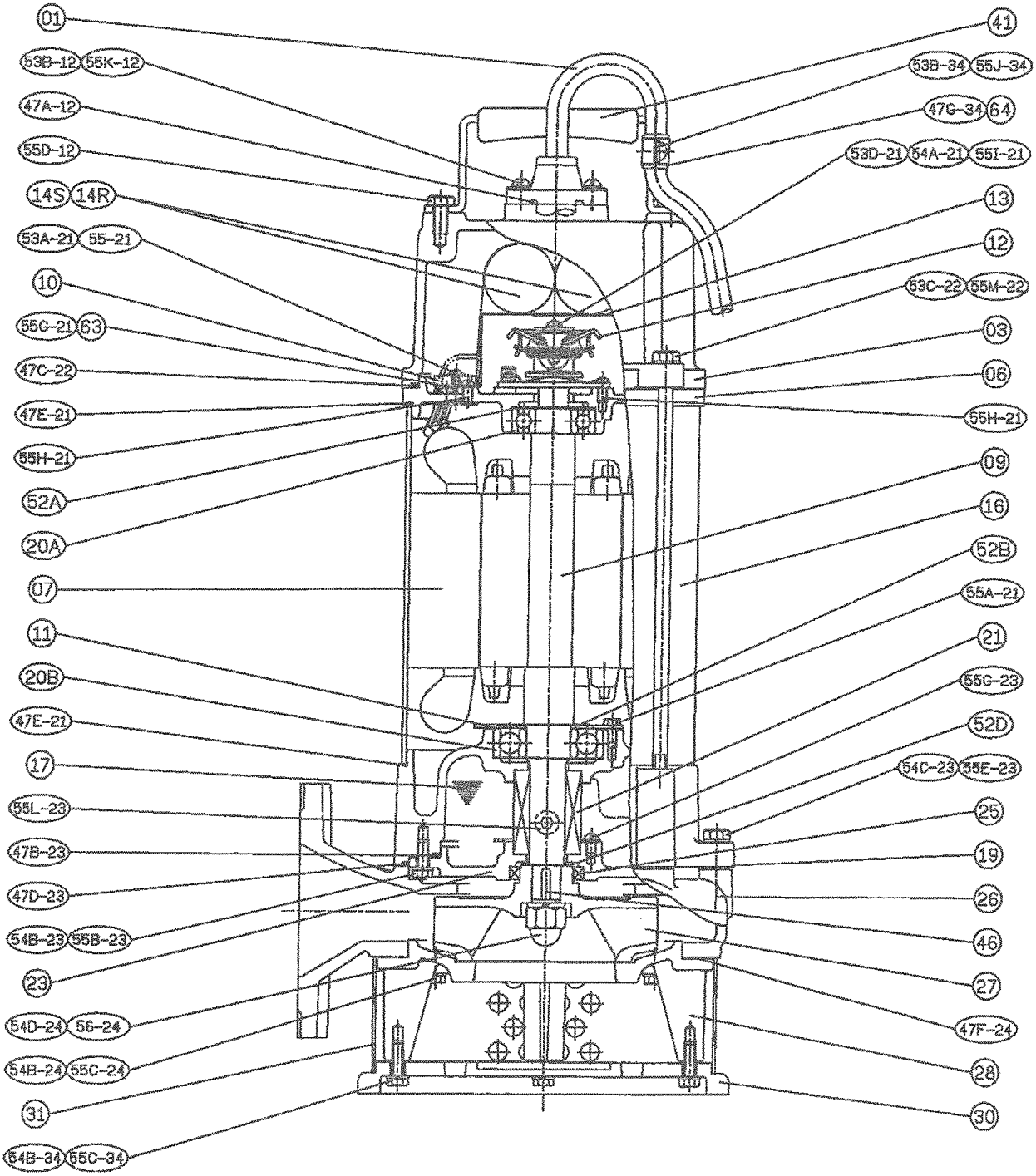
The recirculation pumps will be sized to produce:

224.5 GPM @ 21.5 feet of head

Use: HCP Model A-43, 4" Discharge, 3HP, 2 pumps total

HCP PUMP	SECTIONAL DRAWING	A4A00222010-00
		DATE:2012-12

MODEL: A-43 1Ø

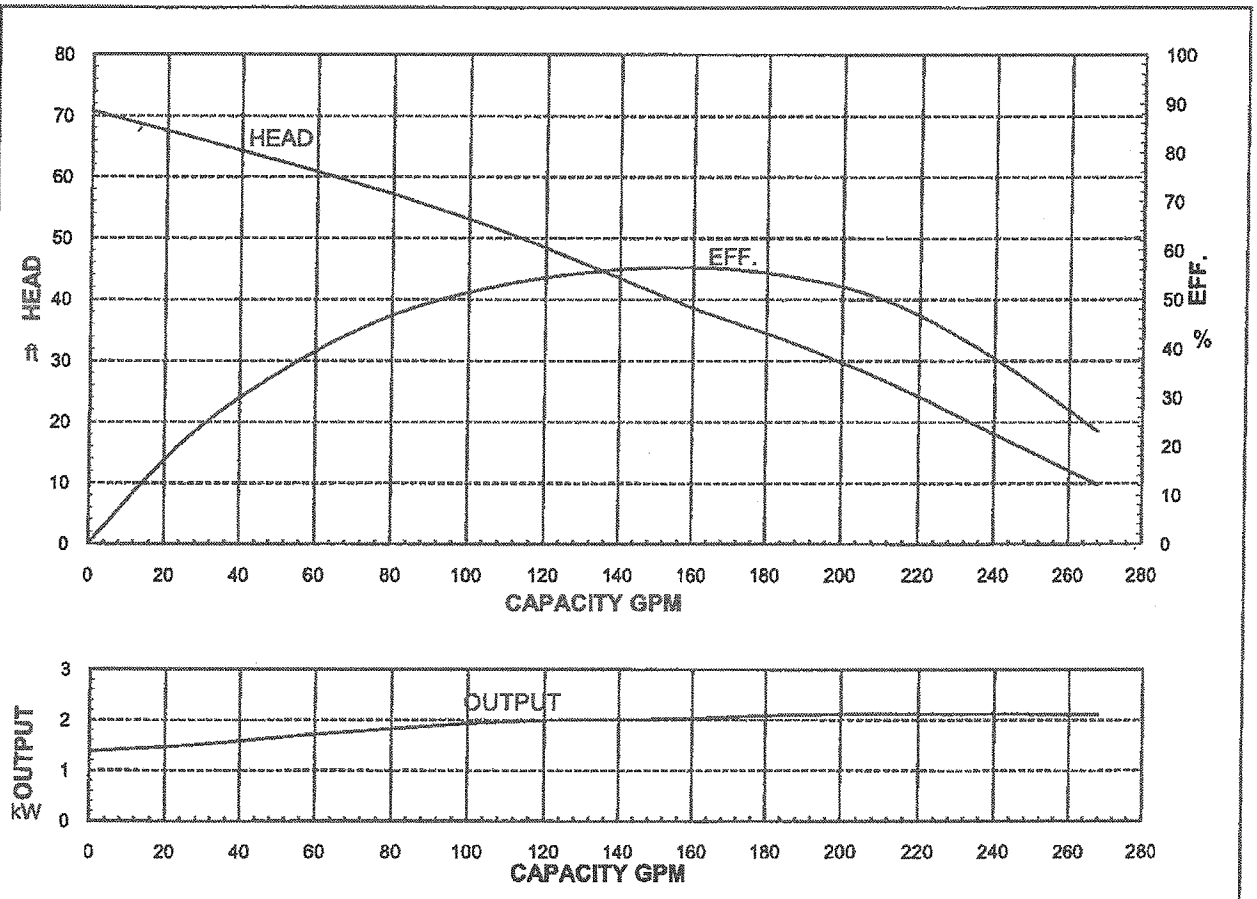


HCP PUMP

FILE NO PC-FT-E6-A431

PUMP PERFORMANCE CURVES

MODEL	A-43	DATE: 2011.1
	STANDATD SPECIFICATION	REFERENCED SPECIFICATION
FREQUENCY	60 Hz	
DISCHARGE	4 inch / 100 mm	
OUTPUT	3 HP / 2.2 kW	HP kW
HEAD	32 ft	
CAPACITY	185 GPM	
PHASE/VOLTAGE	1 ϕ 220 V 230 V 240 V V V	ϕ V
RATED CURRENT	14.4 A 14.0 A 13.8 A A A	A
POLE / R.P.M.	2 P / 3450 R.P.M.	
START METHOD	DIRECT	
INSULATION CLASS	B	
REMARK		



HCP PUMP MANUFACTURER CO.,LTD.

SIGNATURE :

NEW Drip Irrigation Disposal soils

Hydraulic Loading: The proposed drip fields will be predominantly installed in deep, well drained to moderately well drained soils. These soils are typically Silt loam to Silty clay loam in the upper 20 to 30" of depth. The design loading rate will be 0.25 gal/sf/day.

TDEC approved soils area	= 37,698 SF
Design loading rate	= 0.25 gal/sf/day (gpd/sf)
Design daily capacity for disposal	= 7,539 GPD (approx.)

Drip emitter piping will be used for drip disposal. Netafim Bioline 0.61 (1/2") pipe, with 2 foot orifice spacing of emitters, will be plowed-in-place on approximately 5 foot pipe centers. Actual installation will be dictated by existing grade, and at the direction of the design engineer. Actual installed LF of piping should be expected to range from a minimum of 6,000 LF of pipe, to a maximum of 7,500 LF of pipe.

Bioline Drip Emitter Piping Calculations

General Design

Drip system will be constructed using Netafim Bioline .570 I.D tubing, with 0.61GPH emitters. All design calculations are based on the Netafim design literature. Normal dosing pressure will be minimum of 25 PSI (58 ft of head) and a maximum of 60 PSI (110 ft of head). If possible, design will stay in this range without pressure reducers and multiple pumps. The proposed pumps are **two STEP30-10221 (1 HP, single phase pump, 220V)**.

Bioline piping requires 1.6 GPM per distal end to properly flush the emitters. This system will be built in cells of 4000 LF of dripper line (maximum), per cell. The installed number of total cells is expected to be 2 zones, but will be dictated by the existing site contours, and at the direction of the engineer. The maximum number of distal ends in any cell shall be 15 lines.

Therefore:

15 distal ends * 1.6 GPM/distal end = 24 GPM minimum to achieve flushing.

Use: 24 GPM

Using a 24" spacing with the Bioline 0.61, the head loss in laterals up to 400 LF in length is approximately 7 ft. This number is to be called Δ P. (From manufacturer's info.)

Therefore:

Δ P = 7 (From Netafim)

Using ΔP = 7, the minimum inlet pressure required for proper flushing is 37 PSI (30 PSI for drip flush, 7 PSI for flush solenoid).

The return lines are generally an uphill hydraulic grade. The flush solenoid valve will be in the control building above the system.

37 PSI * 2.3 = 85 feet of head (approx.) at lateral entrance (top of drip field)

Size pumps for normal operation:
Regular Min dosing flow: (per cell) 4000 LF / 2' centers = 2000 emitters
2000 emitters * 0.61 gph = 1220 gph
1220 gph / 60 min / hour = 20.33 gpm Use: 21 gpm
Head Losses:
Flow – 21 GPM
Transport Pipe: 1010 lf @ 0.673 ft/100 = 6.8 ft (2" Pipe)

H_L for Disc. Filter @ 21 gpm = 2 ft
Misc. for Bends Etc: 5 ft
Minimum Pump Requirements:
21 GPM @ 69 ft. min. normal operating pressure + friction losses in transport pipe (6.8 ft.) + elevation head (5 ft.) + Arkal filter (2 ft.) + misc. (5 ft.) = 87.8 TDH (Top Lateral)
AT 21 GPM pump STEP30-10221 generates- 150 ft of head. **OK**

Size Pumps for Flushing-Dosing Requirements:
Normal Dosing + Flushing Flow: 26 GPM + 24 GPM (Flushing) = 50 GPM
Head Losses:
Transport Pipe: 2700 lf @ 0.5 ft/100 = 13.6 ft (3")
H_L for Disc. Filter @ 50 GPM = 3 ft
Misc. for Bends Etc: 5 ft
Flushing Solenoid: 16 ft
TDH = 69 ft (static) + 35 (elev.) + 3 (Arkal) + 13.6 (friction) + 16 (fl solenoid) + 5 misc. = 141.6 ft.

Total head required for flushing: 69 ft. (static at inlet manifold) + 72.6 = 141.6 ft
Size pumps for min: 50 GPM @ 141.6 ft. head

Use both pumps for Dosing-Flushing cycle:
Therefore, in order to adequately dose and flush the Bioline tubing, each pump must produce:
26 GPM @ 141.6 TDH (use two pumps at the same time to get 50 GPM)

STEP30-10221 will produce 150 ft of head under these conditions

Check Pressure at Header Pipe (top of Drip Field):
Actual head = 150 – 35 (elev.) – 2 (Arkal) – 4.1 (friction) - 5 misc. = 103.9 ft = 45.2 PSI - **OK**

Check Pressure at Header Pipe (bottom Drip Field):
Actual head = 150 ft + 35 (- elev.) – 2 (Arkal) – 4.1 (friction) - 5 misc. = 173.9 ft = 75.61 PSI – **Too HIGH. Use Pressure reducing valve (PRV) to reach 50 PSI.**

Check for pressure overload if flush valve is inoperable:
Flow for two pumps will be 26 GPM normal dose + 24 GPM flushing = 50 GPM

Each pump will deliver 25 GPM @ 154 TDH

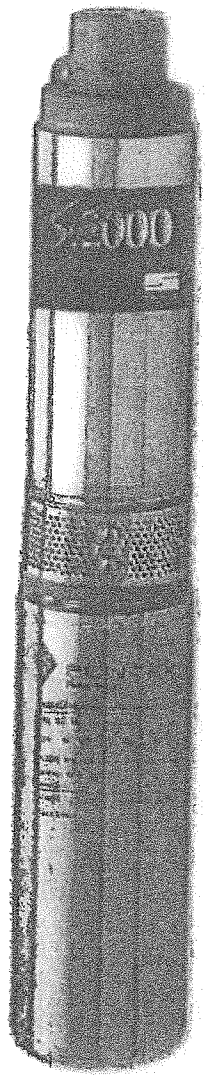
Pressure at bottom of Drip field:
154 + 35 (- elevation) – 3 Arkal - 5 (Misc) – 13.6 (friction) = 167.4 TDH = 72.78 PSI
Pressure is **Too High. HAWKOS will close Flushing By-pass solenoid, cancel flushing cycle, and send maintenance alert.**

Final Discharge Pumps:

Two (2) STEP30-10221 (1 HP, single phase, 220V) pumps.

STA-RITE

4" submersible pumps – 10, 15, 20, 30, and 50 gpm



POWERED BY PENTEK Pentair Water

C US NSF/ANSI 61 Drinking Water

Precision-engineered, high-quality, rugged Signature 2000® Stainless Steel Series Pumps deliver efficient, dependable performance even in rough, aggressive water. Heads to 1,950 feet and capacities to 65 GPM. Built to deliver long-term, trouble-free service. Floating impeller design resists sand and reduces sand locking. These pumps feature the patented SignaSeal™ staging system.

APPLICATIONS

- **Water systems...** for residential, industrial, commercial, multiple housing and farm use.

SPECIFICATIONS

Shell – Stainless steel
Diameter – 3-7/8"
Discharge – Stainless steel
Discharge Bearing – Nylatron®
Intermediate Bearing – (On larger units) Polycarbonate, nitrile rubber and stainless steel
Impellers – Acetal
Diffusers – Polycarbonate
Suction Caps – Polycarbonate with stainless steel insert
Thrust Pads – Proprietary spec.
Shaft and Coupling – Stainless steel
Intake – Stainless steel
Intake Screen – Polypropylene
Cable Guard – Stainless steel
Check Valve – Acetal†
Agency Listings – CSA

Signature 2000

STAINLESS STEEL

FEATURES

Patented Staging System – Our proven SignaSeal™ staging system incorporates a harder-than-sand ceramic wear surface that when incorporated with our floating impeller design, greatly reduces problems with abrasives, sand lock-up and running dry.
Discharge – Corrosion-resistant 300 grade stainless steel for durability in aggressive water. Large octagon wrench area for ease of installation.
Discharge Bearing – Exclusive self-lubricating Nylatron® bearing resists wear from sand.
Intake – Corrosion-resistant 300 grade stainless steel for durability in aggressive water.
Shaft – Positive drive from 7/16" hexagonal heavy-duty 300 grade stainless steel.
Coupling – Stainless steel press fit to pump shaft. Couples to all standard NEMA motors.
Shell – Highest grade, heavy-walled corrosion-resistant stainless steel. Threaded for easy servicing.
Hardware – All screws, washers and nuts are corrosion-resistant 300 grade stainless steel.
Check Valve† – Durable internal spring-loaded check valve.
Cable Guard – Corrosion-resistant stainless steel guard protects motor leads. Tapered ends prevent pump from catching on well.
Intake Screen – Corrosion-proof.
PENTEK® XE Motor – 2 and 3 wire NEMA standard all stainless construction water-filled motors.

†Except where noted.

STA-RITE

4" submersible pumps – 10, 15, 20, 30, and 50 gpm

ORDERING INFORMATION

GPM	Motor Type	HP	Stgs.	PH	Volt	Assembled Pump Catalog Number	Assembled Pump Length Inches*	Assembled Pump Weight Pounds*	Pump End Catalog Number	Pump End Length Inches*	Pump End Weight Pounds*	Motor Catalog Number	Motor Weight Pounds*	Control Box Catalog Number	Control Box Weight Pounds*
20**	2 Wire	3/4	5	1	230	S20P4HS07221	23-3/4	30	L20P4DH	12-1/2	8-1/2	P42B0007A2	23		
		1	7	1	230	S20P4HS10221	27-1/4	34	L20P4EH	14-3/4	9-3/4	P42B0010A2	25		
		1-1/2	9	1	230	S20P4HS15221	32	39	L20P4FH	16-3/4	10-3/4	P42B0015A2	29		
	3 Wire	3/4	5	1	230	S20P4HS07231	23-3/4	30	L20P4DH	12-1/2	8-1/2	P43B0007A2	23	SMC-CR0721	5
		1	7	1	230	S20P4HS10231	27-1/4	34	L20P4EH	14-3/4	9-3/4	P43B0010A2	25	SMC-CR1021	5
		1-1/2	9	1	230	S20P4HS15231	30-1/2	39	L20P4FH	16-3/4	10-3/4	P43B0015A2	29	SMC-CR1521	7
		1-1/2	9	3	230				L20P4FH	16-3/4	10-3/4	P43B0015A3	23		
		1-1/2	9	3	460				L20P4FH	16-3/4	10-3/4				
		2	12	1	230				L20P4GH	20-1/4	12-1/2	P43B0020A2	31	SMC-CR2021	7
		2	12	3	230				L20P4GH	20-1/4	12-1/2	P43B0030A3	32		
		2	12	3	460				L20P4GH	20-1/4	12-1/2				
		3	17	1	230				L20P4HH	25-3/4	15	P43B0030A2	40	SMC-CR3021	7
		3	17	3	230				L20P4HH	25-3/4	15	P43B0030A3	32		
		3	17	3	460				L20P4HH	25-3/4	15				
		5	28	1	230				L20P4JH	38	21	P43B0050A2	70	SMC-CR5021	8
		5	28	3	230				L20P4JH	38	21	P43B0050A3	55		
		5	28	3	460				L20P4JH	38	21				
		7-1/2	40	3	230				L20P4KH	53-3/4	30	P43B0075A3	70		
		7-1/2	40	3	460				L20P4KH	53-3/4	30				
		10	54	3	460				L20P4LH	71	41				
30***	2 Wire	1	5	1	230	S30P4HS10221	26-1/2	35	L30P4EH	14	9-3/4	P42B0010A2	25		
		1-1/2	6	1	230	S30P4HS15221	30-1/2	39	L30P4FH	15-1/4	10-3/4	P42B0015A2	29		
	3 Wire	1	5	1	230	S30P4HS10231	26-1/2	35	L30P4EH	14	10	P43B0010A2	25	SMC-CR1021	5
		1-1/2	6	1	230	S30P4HS15231	29	39	L30P4FH	15-1/4	11	P43B0015A2	29	SMC-CR-1521	7
		1-1/2	6	3	230				L30P4FH	15-1/4	11	P43B0015A3	23		
		1-1/2	6	3	460				L30P4FH	15-1/4	11				
		2	8	1	230				L30P4GH	18-1/4	12	P43B0020A2	31	SMC-CR2021	7
		2	8	3	230				L30P4GH	18-1/4	12	P43B0020A3	23		
		2	8	3	460				L30P4GH	18-1/4	12				
		3	12	1	230				L30P4HH	24	15	P43B0020A2	40	SMC-CR3021	7
		3	12	3	230				L30P4HH	24	15	P43B0030A3	32		
		3	12	3	460				L30P4HH	24	15				
		5	20	1	230				L30P4JH	35-3/4	20	P43B0050A2	70	SMC-CR5021	8
		5	20	3	230				L30P4JH	35-3/4	20	P43B0050A3	55		
		7-1/2	28	3	230				L30P4KH	50	27	P43B0075A3	70		
		7-1/2	28	3	460				L30P4KH	50	27				
		10	38	3	460				L30P4LH	65-1/2	35				

* Length and Weight are approximate.

** For 10 GPM, 15 GPM, and 20 GPM, discharge is 1-1/4" NPT.

*** For 30 GPM and 50 GPM discharge is 2" NPT.

NOTE: On 2 HP and larger – Pump, Motor, Control Box or Magnetic Starter must be ordered separately.

†Check Valve not included on 5 HP, 7-1/2 HP and 10 HP models. Check valve not included on 50 GPM models.

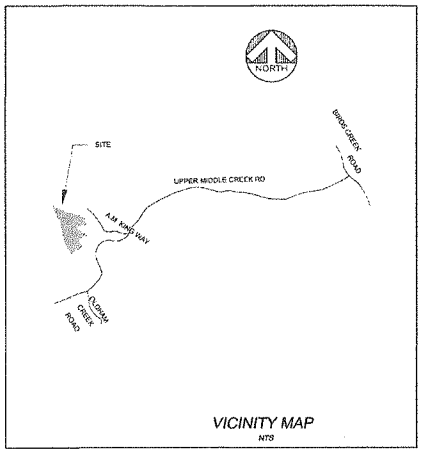
TrimLine™ version maximum outside diameter 3-3/4". Standard version maximum outside diameter on all models is 3-7/8".

SUMMITT VIEW TF
DRIP FIELD - TREATMENT EXPANSION
SEVIER COUNTY, TN

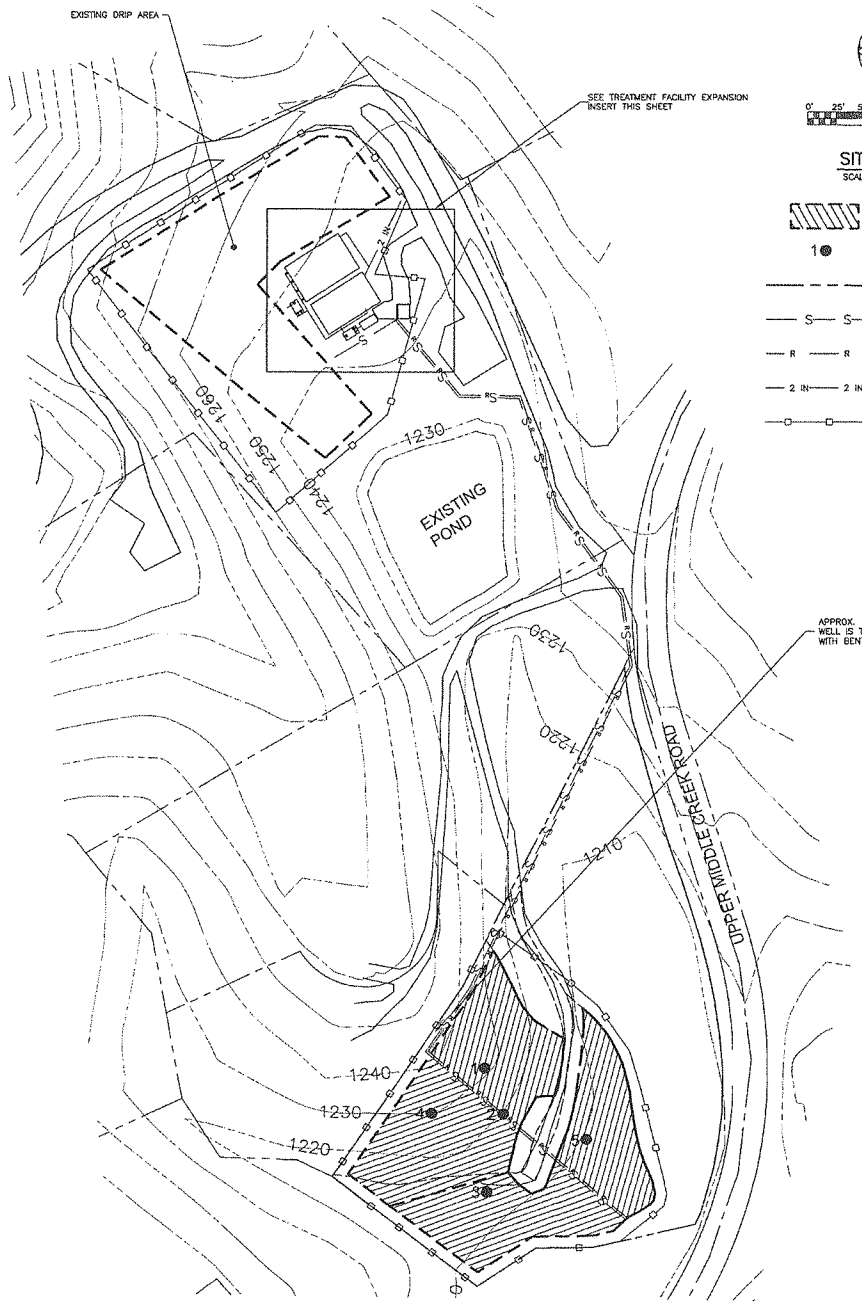
SOP # - 06035

CONTENTS:

APRIL 2, 2015



ADENUS SOLUTIONS GROUP 849 AVIATION PARKWAY SMYRNA, TN 37167



NORTH

0' 25' 50' 100' 150'

SITE LAYOUT

SCALE: 1" = 50'

APPROXIMATE ORIENTATION OF DRIP LINES

SOIL PIT – PROFILED (APPROX. LOCATION)

NEW SOIL AREA PROPERTY BOUNDARY

S — S DRIP FIELD SUPPLY

R — R DRIP FIELD RETURN (FLUSH)

2 IN — 2 IN INLET FM FROM CABINS

FENCE (APPROX. LOCATION)

Tennessee811
Know what's below.
Call before you dig.

IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND POSSIBLY INCOMPLETE. THEREFORE CERTIFICATION TO THE LOCATION OF ALL UNDERGROUND UTILITIES IS WITHHELD.

NOTES:

1. LOCATION OF EXISTING STRUCTURES AND PROPERTY LINES WERE TAKEN FROM SEVIER COUNTY GIS MAPS, AERIAL MAPS, AND PARTIAL SURVEYS FOR SOIL MAPPING. CONTRACTOR SHALL VERIFY ACTUAL LOCATIONS IN THE FIELD.

2. ALL SEWAGE SYSTEM STRUCTURES SHOWN ON THESE PLANS ARE NEW OR PROPOSED UNLESS OTHERWISE NOTED.

3. ACCESS TO THE TREATMENT FACILITY WILL BE RESTRICTED BY A FENCE WITH SIGNS POSTED IDENTIFYING USE.

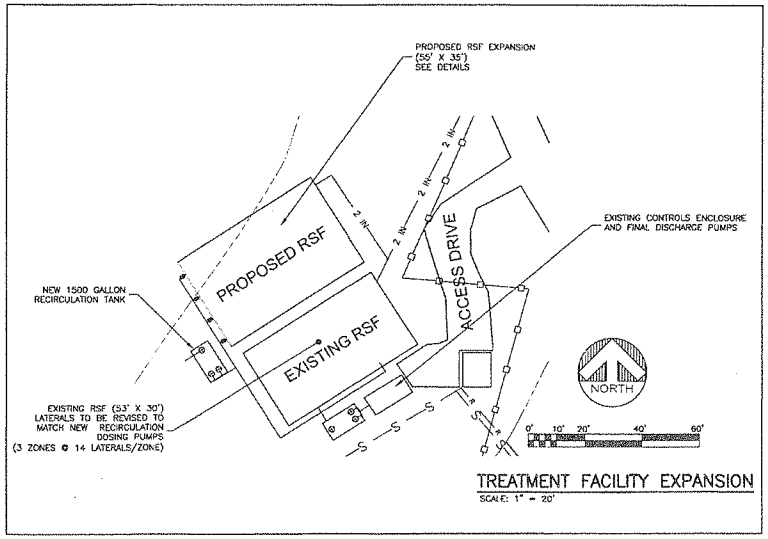
4. TENNESSEE WASTEWATER SYSTEMS, INC. SHALL OWN, OPERATE, AND MAINTAIN THE WASTEWATER TREATMENT AND DISPERSAL SYSTEMS, AND SHALL OWN THE PROPERTY, OR HAVE AN EASEMENT FOR ALL REQUIRED LAND TO OPERATE AND MAINTAIN SAID SYSTEMS.

5. SOIL INFORMATION TAKEN FROM SOIL MAP PREPARED BY MR. KEVIN DAMS, DATED 10-30-2014.

6. CONTRACTOR WILL CONSTRUCT THE ENTIRE TREATMENT EXPANSION, AND NEW DRIP DISPERSAL SYSTEM EXPANSION BEGINNING AT THE CONNECTION TO THE EXISTING FORCE MAIN ENTERING THE EXISTING RSF.

7. CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCING ANY EXCAVATION WORK. ANY DAMAGED UTILITIES SHALL BE REPAIRED IMMEDIATELY TO ITS ORIGINAL OR BETTER CONDITION BY THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.

8. THE LOCATION OF TREATMENT AND DISPOSAL EXPANSION SYSTEM COMPONENTS AS SHOWN ARE GENERAL IN NATURE. MINOR FIELD ADJUSTMENTS MAY BE NECESSARY. THE CONTRACTOR MAY REQUEST TO MODIFY THE LOCATION OF THE COMPONENTS THROUGH THE UTILITY, AND THE DESIGN ENGINEER.



TREATMENT FACILITY EXPANSION

SCALE: 1" = 20'

SUMMITT VIEW RESORT TF EXPANSION

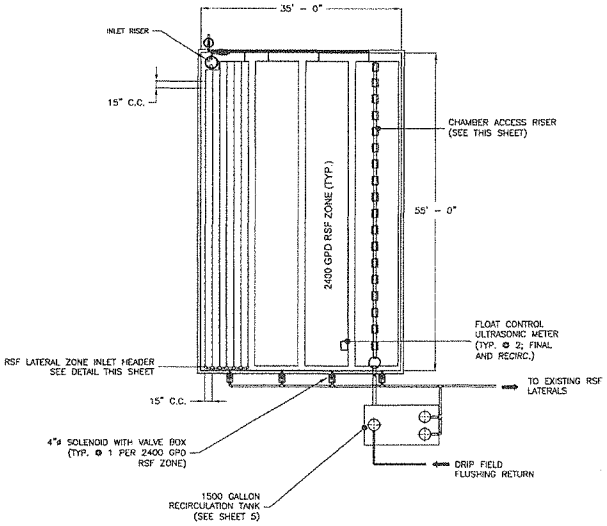
FOR

SUMMITT VIEW RESORT

LOCATED OFF UPPER MIDDLE CREEK ROAD

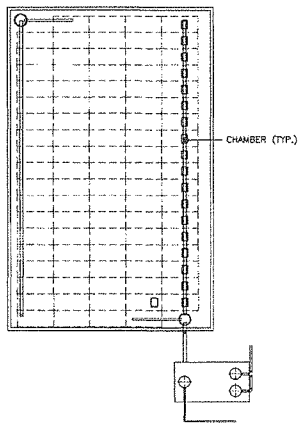
SEVIER COUNTY, TENNESSEE

Checked by: RCD	Drawn by: BKT	Date: 4-2-2015
Scale: AS NOTED	PLANS PREPARED BY: Adenus SOLUTIONS GROUP®	
Filename: SUMMIT VIEW EXPANSION		
SHEET 2 OF 6		



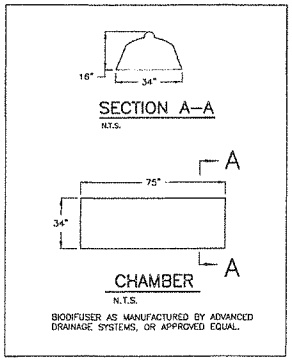
RECIRCULATING SAND FILTER – PLAN

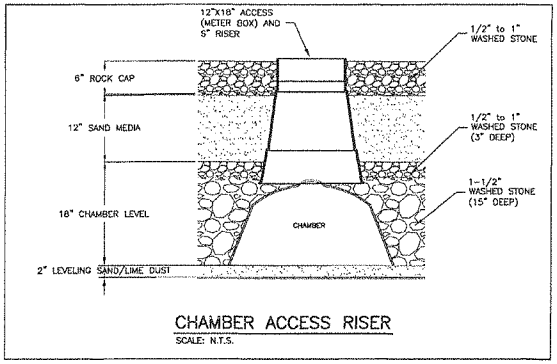
SCALE: 1" = 10'



RECIRCULATING SAND FILTER CHAMBER LEVEL – PLAN

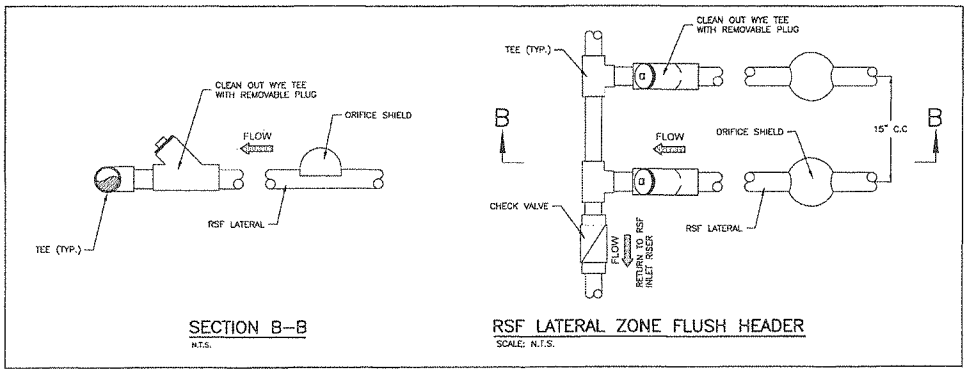
SCALE: 1" = 10'

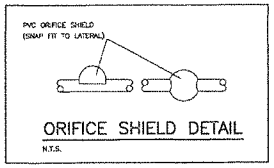


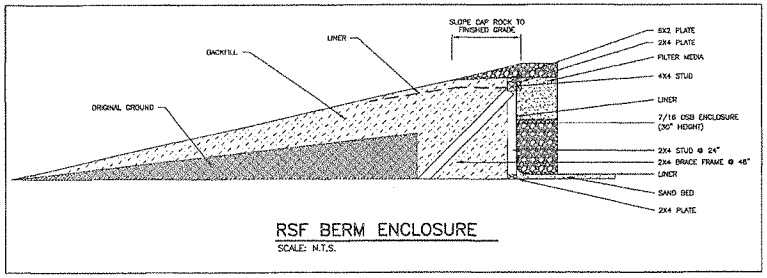


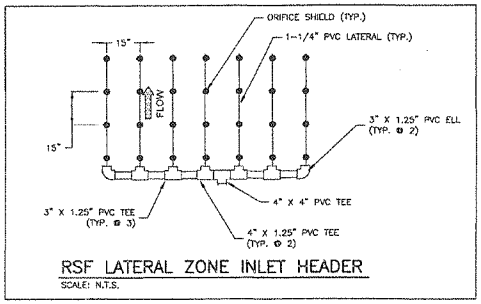
CHAMBER ACCESS RISER

SCALE: N.T.S.





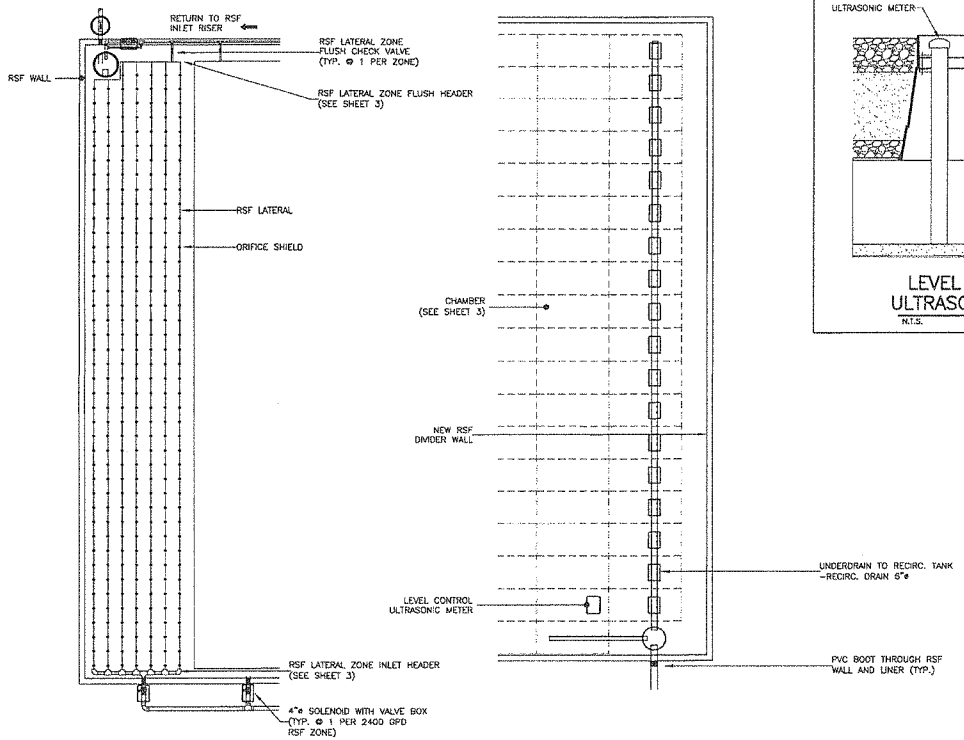




SUMMITT VIEW RESORT TF EXPANSION
FOR
SUMMITT VIEW RESORT

LOCATED OFF UPPER MIDDLE CREEK ROAD
SEVIER COUNTY, TENNESSEE

Checked by: RCD	Drawn by: BKT	Date: 4-2-2015
Scale: AS NOTED	PLANS PREPARED BY: Adenus SOLUTIONS GROUP®	
Filename: SUMMIT VIEW EXPANSION		
SHEET 3 OF 6		



2400 GPD RSF ZONE(55) – PLAN

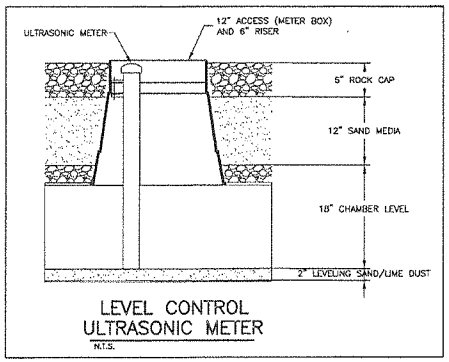
SCALE: N.T.S.

2400 GPD RSF ZONE(55) – CHAMBERS

SCALE: N.T.S.

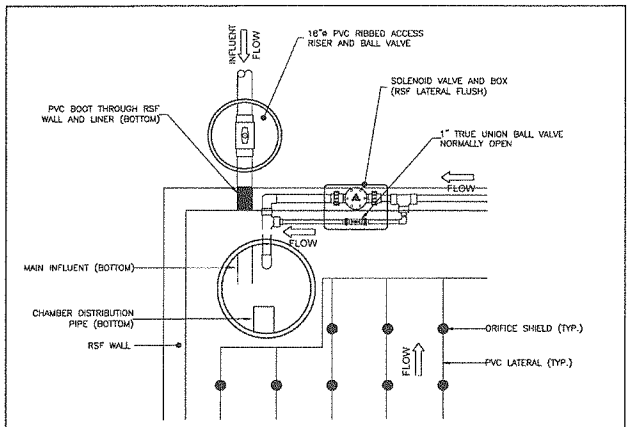
STANDARD 5000 GPD RSF TREATMENT ZONE – 55 FT. RSF:

NUMBER OF LATERALS:	7
LATERAL DIAMETER:	1-1/4"
NUMBER OF ORIFICE/LATERAL (/ZONE):	42 (294)
4"ø SOLENOID VALVE	1



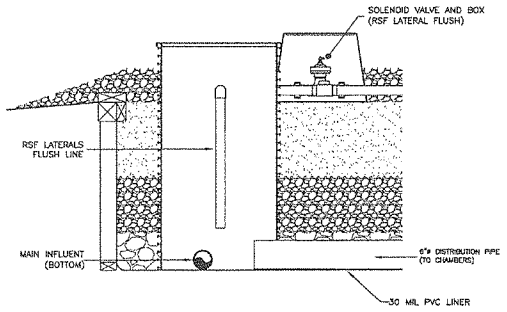
LEVEL CONTROL ULTRASONIC METER

N.T.S.



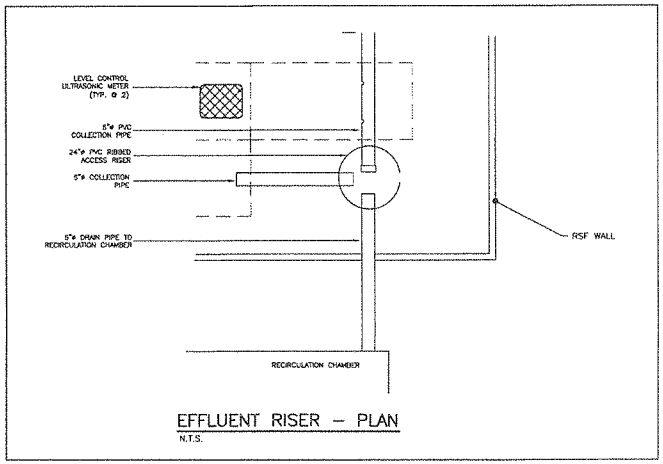
INLET RISER – PLAN

SCALE: N.T.S.



INLET RISER

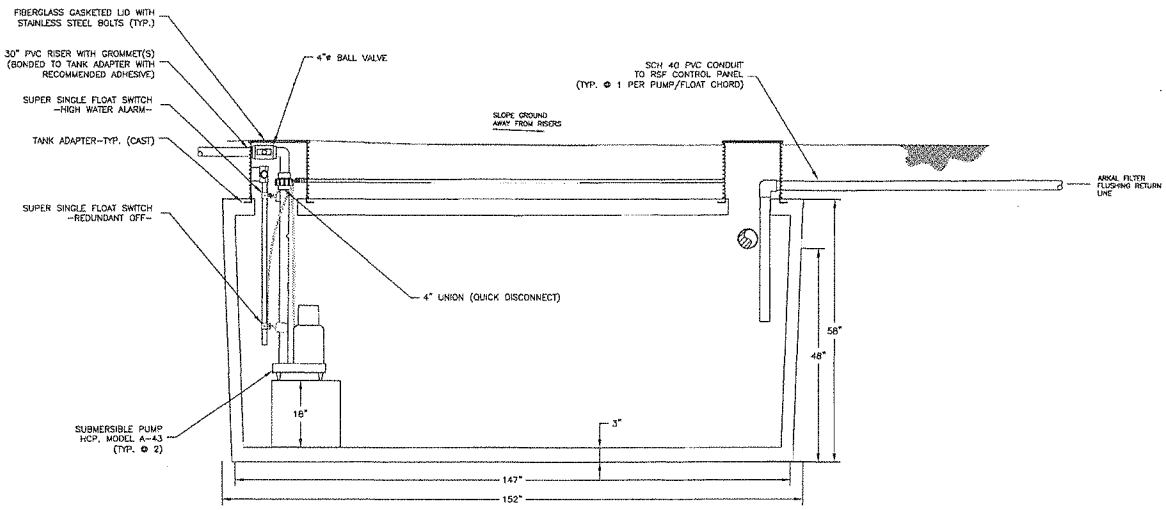
N.T.S.



EFFLUENT RISER – PLAN

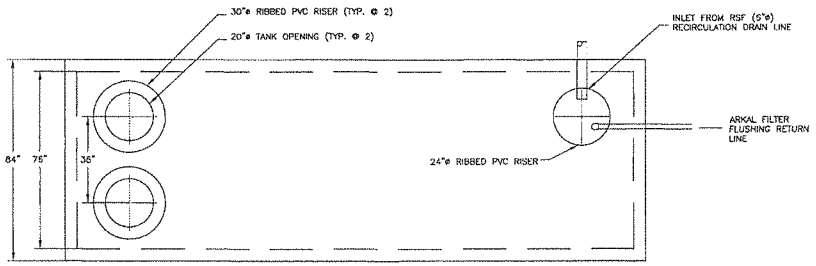
N.T.S.

SUMMITT VIEW RESORT TF EXPANSION FOR SUMMITT VIEW RESORT		
LOCATED OFF UPPER MIDDLE CREEK ROAD SEVIER COUNTY, TENNESSEE		
Checked by: RCD	Drawn by: BKT	Date: 4-2-2015
Scale: AS NOTED	PLANS PREPARED BY: Adenus SOLUTIONS GROUP®	
Filename: SUMMIT VIEW EXPANSION		
SHEET 4 OF 6		



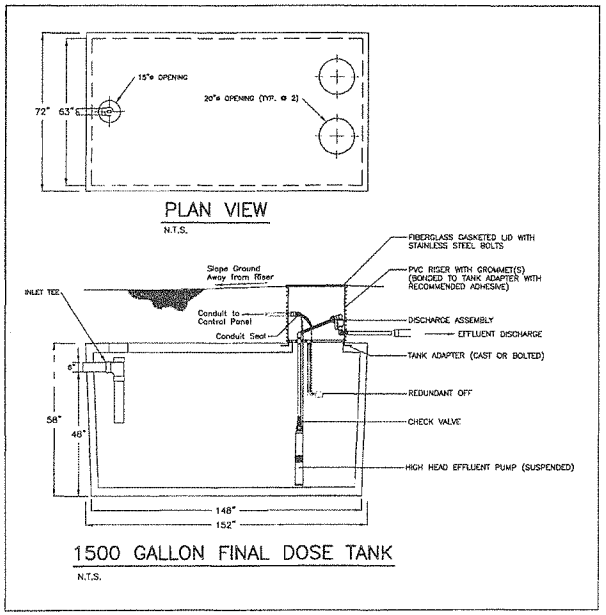
1,500 GALLON RECIRCULATION CHAMBER

N.T.S.



1,500 GALLON RECIRCULATION CHAMBER – PLAN

N.T.S.



1500 GALLON FINAL DOSE TANK

N.T.S.

SUMMITT VIEW RESORT TF EXPANSION FOR SUMMITT VIEW RESORT		
LOCATED OFF UPPER MIDDLE CREEK ROAD SEVIER COUNTY, TENNESSEE		
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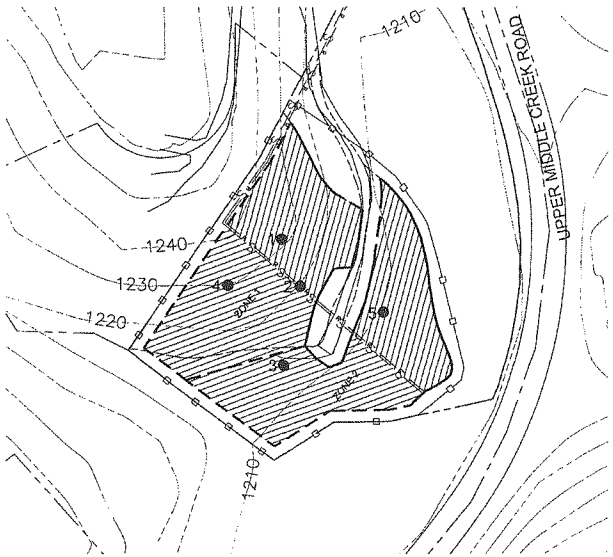
Filename: SUMMIT VIEW EXPANSION		
SHEET 5 OF 6		

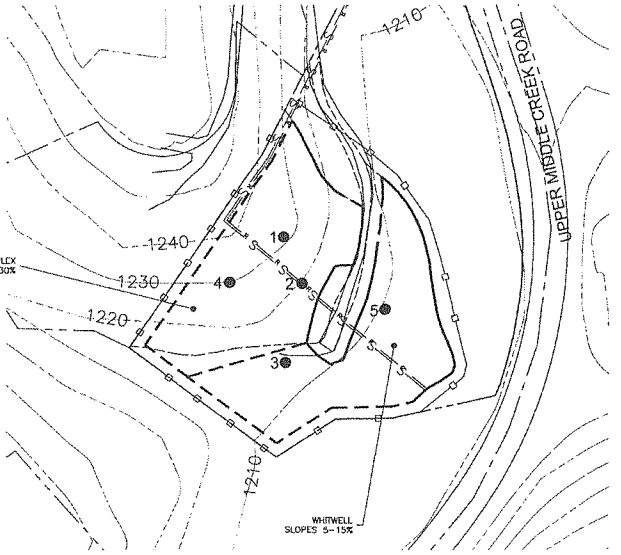


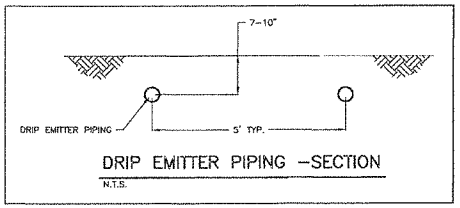
- EACH DRIP FIELD ZONE WILL HAVE 3,000 TO 4,000 LF± OF BIOLINE DRIP EMITTER PIPING PER ZONE (APPROX.).
- SEE CALCULATIONS FOR DESIGN CRITERIA AND MAXIMUM NUMBER OF CONNECTIONS PER ZONE. MAXIMUM LENGTH OF EACH DRIP LINE WILL BE 400 LF. A BIOLINE LOOP MAY BE USED ON ANY LINE. SOME LINES MAY HAVE MORE THAN ONE LOOP (i.e. – LOOP THE LINE UNTIL 400 LF, OR LESS, IS ACHIEVED).
- LOADING RATE: 0.25 GPD/SF
  SUITABLE SOILS AVAILABLE = 37,698 SF±
  SOIL CAPACITY @ 0.25 GPD/SF = 7500 GPD (APPROX.)
- THIS LOADING RATE WILL SPLIT THE AVAILABLE SOILS INTO 2 DRIP ZONES OF APPROX. 19,000 SF PER ZONE. IRREGULAR SLOPE CONDITIONS ARE EXPECTED. FINAL PIPING INSTALLATIONS WILL USE ALL OF THE AVAILABLE SOILS AREA. ENGINEER WILL INSURE THAT THE INSTALLATIONS DO NOT EXCEED THE ZONE DESIGN MAXIMUM REQUIREMENTS.

10 FT. PROPERTY LINE BUFFER ZONE TO BE MAINTAINED AROUND ALL DRIP FIELDS

REFER TO SOIL MAPPING PREPARED BY MR. KEVIN DAVIS, DATED 10-30-2014.

- APPROXIMATE ORIENTATION OF DRIP LINES
- 1 SOIL PIT – PROFILED (APPROX. LOCATION)
- NEW SOIL AREA PROPERTY BOUNDARY
- S S DRIP FIELD SUPPLY
- R R DRIP FIELD RETURN (FLUSH)
- 2 IN 2 IN INLET FM FROM CABINS
- FENCE (APPROX. LOCATION)

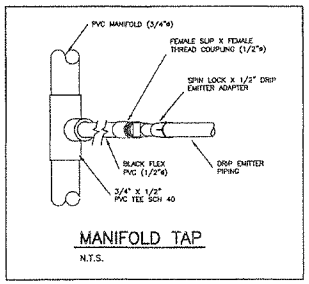




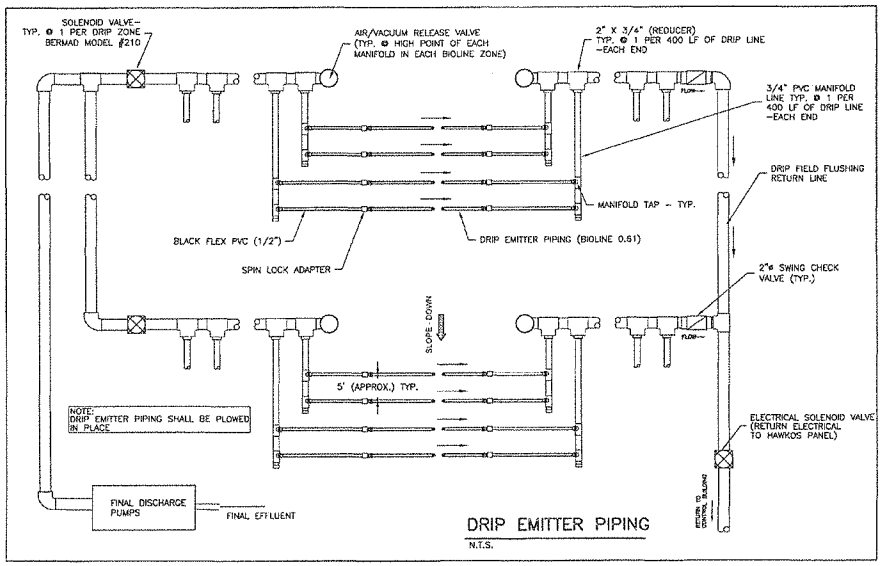
DRIP EMITTER PIPING –SECTION
N.T.S.

SITE LAYOUT – ZONES
SCALE: 1" = 50'

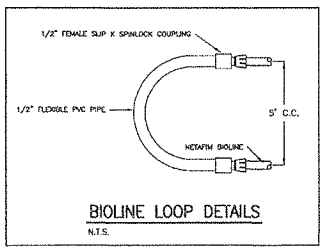
SITE LAYOUT – DRIP
SCALE: 1" = 50'



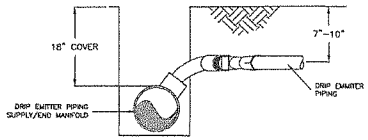
MANIFOLD TAP
N.T.S.



DRIP EMITTER PIPING
N.T.S.



BIOLINE LOOP DETAILS
N.T.S.



DRIP EMITTER MANIFOLD –SECTION
N.T.S.

SUMMITT VIEW RESORT TF EXPANSION FOR SUMMITT VIEW RESORT		
LOCATED OFF UPPER MIDDLE CREEK ROAD SEVIER COUNTY, TENNESSEE		
Checked by: RCD	Drawn by: BKT	Date: 4-2-2015
Scale: AS NOTED	PLANS PREPARED BY: Adenus SOLUTIONS GROUP®	
Filename: SUMMIT VIEW EXPANSION		
SHEET 6 OF 6		

SUPPLEMENTAL RESPONSE 20:

On April 9, 2015, TWSI issued a "Request for Proposals" to solicit bids for repairs at any one or more of the four sites at issue in this case. A copy of the RFP and the names of all entities receiving the RFP are attached.

REQUEST FOR PROPOSALS

Tennessee Wastewater Systems, Inc.

Date issued: April 9, 2015

Statement of Purpose

Tennessee Wastewater Systems, Inc. (TWSI) is requesting proposals from qualified decentralized wastewater contractors to complete required upgrades and construction at four separate wastewater systems within its service territory. TWSI is committed to the continuing success of its decentralized program, and these projects are important to that success. These upgrades are outside the normal operation and maintenance, and require additional funding to the normal rate structure.

Background Information

The proposed projects are:

1. **Maple Green Wastewater System:**

   Construction of a wetland treatment system as a result of an emergency order issued by TDEC at the Maple Green Wastewater Treatment Plant in Coopertown, Tennessee. This project will consist of construction two wetland cells and associated influent and discharge piping. Detailed geotechnical work is required prior to commencing construction. A Construction Permit has been issued by TDEC, and the project construction should commence as soon as possible.

2. **Smoky Village Wastewater Treatment System:**

   Installation of a new drip system supply line and drip irrigation system for the sand filter treatment plant at the Smoky Village Treatment Plant (off Hardin Road) in Kodak, Tennessee. This project includes addition of 9000 LF of new drip irrigation line off site from the existing sand filter drip system. Supply lines, return lines, manifolds and electrical wiring are required.

3. **Summit View Wastewater Treatment System:**

   Expansion and upgrade of the wastewater treatment system for Summit View Wastewater Treatment System in Sevierville, Tennessee. The existing sand filter and drip irrigation will be expanded and upgraded to meet actual flows from the Summit View Development. The existing system was built for approximately 8000 gallons per day. The expanded sand filter treatment facility will have a total capacity of approximately 18,000 gallons per day. Additional drip system installation is remote to the current site (approximately 1000 ft.). Existing drip system will be replaced in the previously approved area, including some steep wooded slopes.

Engineering Plans for Summit View have been submitted to TDEC. Soils for drip irrigation have been previously approved. TDEC is expected to issue the Permit for Construction in the next 30 days.

4. Cedar Hill Wastewater Treatment System:

Construction of a two cell wetland treatment system as a result of an order issued by TDEC at the Cedar Hill Wastewater Treatment System in Adams Tennessee. The wetland is replacing an existing deep cell facultative pond. This project consists of two wetland cells and associated inlet and outlet piping.

Plans have been submitted to TDEC, and are currently in the administrative hearing process. Construction should begin as soon as the administrative process with TDEC is resolved.

Invitation for RFP is only being transmitted email. If copies of plans are desired, they will be available for $30 per set (reproduction cost). (One copy of all sites would be $120).

For plans and project information please contact Roy Denney at:

Roy Denney
office - 615-220-7200
Cell - 615-691-2913
Email: roy.denney@adenus.com

Scope of Work

The intent of this RFP is to have the firms under consideration specifically address the services required and provide a well-considered price proposal for those services. The Tennessee Regulatory Authority has requested the RFP be sent to the list of potential contractors and all Utility companies under TRA control.

The owner desires for a "turnkey" approach, where the contractor will provide price and construction schedule for completion of each project. TWSI personnel will provide oversight and inspection for all phases of the construction. Each project will be considered separately for proposed cost and schedule of completion.

1. Proposed construction cost on the projects will be contingent on coordination / approval by the Tennessee Regulatory Authority. The construction plans are general in nature may require some field adjustments and application of good construction practices by the contractor to competently complete the projects. Contractor should use their experience in completing similar projects to estimate the cost and completion schedule for each of these projects.

2. TWSI has set a date of April 30, 2015 at 2:00 P.M. (central time) for the submission of proposed cost and construction schedule. Proposals may be submitted via email to Charles Hyatt - (Charles.hyatt@adenus.com)

3. Contractors must be licensed by the State of Tennessee to perform this type of work. Contractors will not be required to post bid bonds. However, a performance bond will be required with the final contract. Payment to contractor will be subject to approval of lending institution, TWSI and possibly the Tennessee Regulatory Authority.

Evaluation and Award

4. Review of the proposals received will be based on the given price and the qualification and experience of the contractors of each proposal.

Award shall be made at the discretion of TWSI.

Contracts

5. Contract for construction will be a standard National Society of Professional Engineers Contract or similar instrument (AIA).

6. Each project is expected to be completed within 240 working days after award and notice to proceed.

All questions and answers concerning any project or portion thereof will be shared with all prospective parties that have expressed an interest in submitting a proposal. Questions will be reduce to writing and answered via email to all interested parties.

Proposal Requirements:

Please provide the following information with your proposal:

1.
   a. Name of firm
   b. Complete address
   c. Contact person
   d. Telephone number
   e. E-mail address

2. Provide a short General Statement of Qualifications that responds to the project background information given above.

3. Provide a list of previous projects similar in scope and contact information for the present operator or owner of the systems.

4. Personnel

   a. Provide a list of key personnel and resume for each who would be committed to this project.

5. Insurance

   a. Contractor will be required to have acceptable general liability and workman's comp insurance. Certificate will be required as part of final contract(s).

6. Total Construction Price and estimated time of completion. Proposal may include special provisions, exceptions or other conditions as contractor deems appropriate.

Contact Information for TWSI -

Engineering - Roy Denney
office - 615-220-7200
Cell - 615-691-2913
Email: roy.denney@adenus.com

Administrative - Charles Hyatt
office 615-220-7200
cell - 615-406-5468
Email: charles.hyatt@adenus.com

Legal/contractual - Bob Pickney
office - 615-220-7200
cell - 615-604-4712
Email: bob.pickney@adenus.com

Site Visits for Maple Green and Cedar Hill -
Brian Carter - 615-220-7200
Cell - (615) 691-3409
Email: brian.carter@adenus.com

Site Visit for Smoky Village and Summit View -
John Czahoroski
Cell - 865-386-8989
Email: john.Czahoroski@adenus.com

If more information is needed please do not hesitate to Call:

Thanks,
Bob Pickney
cell: 615-604-4712

Firms invited to submit Proposals:

Glenn Marcum
EcoStruct Group, LLC
2467 Pleasant View Rd.
Pleasant View TN 37146
gmarcum@ecostructgroup.com

Harding Fox
Rutherford Utility Company, LLC
1413 S.E. Street
Murfreesboro TN 37130
rucllc@gmail.com

Mickey Barger
Barger and Sons, Inc.
123 Pawnook Farm Road
Lenoir City TN 37771
mickey@bargerandsons.com

Mike Hines
1920 Breezy Ridge Trail
Knoxville, TN 37922
mikehines@charter.net

Danny Brown
Central Alabama Septic
PO Box 640368
Pike Road Al 36064
cass@centralalabamasepticsystems.com

Tim Huddleston
W&O Construction Company, Inc.
150 Construction Drive
Livingston TN 38570

Bob Conrad
Mid South Boring and Piping LLC
1132 Collierville-Arlington Road
Collierville TN 38017

bconrad@midsouthseptic.com
Dart Kendall
Aqua Utilities Company, Inc.
3350 Galts Road
Acworth GA 30102

James Clausel
Aqua Utilities Company, Inc.
408 Main Street
Savannah TN 38372

Steve Seger
Berry's Chapel Utility
106 Mission Street Suite 203A
Franklin TN 38372

Bruce Meyer
Cartwright Creek
1551 Thompson's Station Road
Thompson's Station TN 37179

Cody Farmer
Condo Villas of Gatlinburg
520 Grace Avenue
Sevierville TN 37862

Tim Huddleston
Cumberland Basin Wastewater Systems, LLC
150 Construction Drive
Livingston TN 38570

Doug Hodge
DSH & Associates, LLC
4028 Taliluna Ave.
Knoxville TN 37919

Allen Johnson
Greenville Sewage, LLC
860 W. Andrew Jackson Hwy.
Greenville TN 37445

John Parton
Old Hickory Water, LLC
110 Coal Drive
P.O. Box 159
Middlesboro KY 40965

Jeffrey Cox
IRM Utility, Inc.
3444 St. Andrews Drive
White Pine TN 37890

John Powell
Kings Chapel Capacity, LLC
1165 Meadow Ridge Lane
Arrington TN 37014

Lisa Thomas
Shiloh Falls Utility
P.O. Box 1027
Savannah TN 38372

SUPPLEMENTAL RESPONSE 28:

Attached is a resume of Mr. Roy Denney who may be called by TWSI as a fact witness and expert at the hearing.

Respectfully submitted,

BRADLEY ARANT BOULT CUMMINGS LLP

By: _____

Henry Walker (B.P.R. No. 000272)
Bradley Arant Boult Cummings, LLP
1600 Division Street, Suite 700
Nashville, TN 37203
Phone: 615-252-2363
Email: hwalker@babc.com

Roy Denney, PE

712 Silverhill Drive; Murfreesboro, TN 37129 Phone: 615-479-9511 MechPE@gmail.com

PROFESSIONAL SUMMARY AND ACHIEVEMENTS

Project engineering and management

- Functioned as the site engineer for the startup and commissioning of the $120 Million Metro Water Services Biosolids Facility.
- Project Manager for the owner in the design of a new $3.5 million effluent pump station to supply process water to the Metro Water Services Biosolids facility.
- Developed operational staffing and procedures for a new facility.
- Site Incident Command at Metro Water Services Central Wastewater Treatment Plant during 500 year flood event in 2010. Managed resources, clean up and recovery efforts, logistics and supplies, and communication to employees when plant communications were down.

Troubleshooting and problem solving

- Assessed environmental conditions resulting in final product failure to meet QC Standards through review of variables during manufacturing conditions. Reduced occurrences of heating and combustion of final product in storage by over 90% with in house modifications to the process.
- Balanced cooling tower control loop to allow return water and make up water bypass when the system did not need cooling capacity. Resolved deadheading and water hammer conditions by review and modifications to control logic.
- Identified and located an ammonia leak in a closed loop, heated water system. Addressed isolation of the leak and discharge of contaminated water.

Public outreach and communication

- Develop and present public outreach presentations for the Metro Water Services Biosolids Facility for schools, public officials, and industry groups.

CAREER EXPERIENCE

March 07 - Present — Metro Water Services — Nashville, TN 37208

Plant Engineer

Plant Engineer for the Metro Water Services Biosolids Facility from the field oversight of construction and contract adherence through to current operations, maintenance, and planning.

- Business management including budgeting, RFPs, document and design review, environmental compliance, and permitting.
- Operations and Maintenance support including programming PLCs and VFDs, developing and maintaining QA/QC testing practices, and failure analysis and review.
- Manage energy recovery and reuse systems.

May 06 – March 07 — Fluor Global Craft [Yoplait/General Mills] — Murfreesboro, TN 37128

Ammonia Technician

Provided maintenance and operational support for the building utilities of the Yoplait production facility. Performed maintenance and improvement projects.

- PLC Controls troubleshooting.

EDUCATION AND LICENSURE

Bachelor of Engineering, Mechanical Engineering — Nashville, TN 2003
Vanderbilt University

FE/EIT — State of Tennessee 2004
PE TN114195 — State of Tennessee 2011
Grade IV Wastewater Treatment Plant Operator — State of Tennessee 2013

VERIFICATION OF SUPPLEMENTAL INTERROGATORY RESPONSES

I, Roy Denney, being an authorized representative of TWSI for the purpose of responding to interrogatories relating to engineering issues, being duly sworn, affirm that the Supplemental Responses set forth above are true, accurate and complete.

Roy C. Denney

COUNTY OF Rutherford
STATE OF Tennessee

On this the 10 day of April, 2015, personally appeared before me, the above-named Roy C. Denney (please print or type name of person responding to these interrogatories on behalf of TWSI and identified in Question 33) known to me personally or made known to me by satisfactory proof who was duly sworn and on oath executed the above verification.

Susan R. Chaffin
Notary Public

SUSAN R. CHAFFIN
STATE OF TENNESSEE NOTARY PUBLIC
RUTHERFORD COUNTY

My Commission Expires:
02/20/2018