



# APPLICATION

## FOR PERCOLATION TESTING AND SITE EVALUATION

TEST DATE(S) \_\_\_\_\_ TEST TIME \_\_\_\_\_

(A/P) 526737

AGENCY REVIEW: \_\_\_\_\_

DATE \_\_\_\_\_

DO NOT WRITE ABOVE THIS LINE

I HEREBY APPLY FOR THE NECESSARY TESTING/EVALUATION PRIOR TO ISSUANCE OF SEWAGE DISPOSAL SYSTEM PERMIT(S) TO:

CHECK AS NEEDED:

- ☐ CONSTRUCT NEW SEPTIC SYSTEM(S)  
☒ REPAIR/ADD TO AN EXISTING SEPTIC SYSTEM  
☐ REPLACE AN EXISTING SEPTIC SYSTEM

CHECK AS NEEDED:

- ☐ NEW STRUCTURE(S)  
☐ ADDITION TO AN EXISTING STRUCTURE  
☒ REPLACE AN EXISTING STRUCTURE

CHECK ONE:

- ☐ CREATE NEW LOT(S)  
☐ BUILD ON AN EXISTING LOT IN A SUBDIVISION  
☒ BUILD ON AN EXISTING PARCEL OF RECORD

IS THE PROPERTY WITHIN 2500' OF ANY RESERVOIR?

- ☐ YES  
☒ NO

THE TYPE OF STRUCTURE IS: 4

- ☒ RESIDENTIAL WITH \_\_\_\_\_ PROPOSED BEDROOMS IN THE COMPLETED STRUCTURE (NOTE **UNKNOWN** IF APPROPRIATE)  
☐ COMMERCIAL (PROVIDE DETAIL OF NUMBERS AND TYPES OF EMPLOYEES/ CUSTOMERS ON ACCOMPANYING PLAN)  
☐ INSTITUTIONAL/GOVERNMENT (PROVIDE DETAIL OF NUMBERS AND TYPES OF EMPLOYEES/USERS ON ACCOMPANYING PLAN)

PROPERTY OWNER(S) Jerry Lewis

DAYTIME PHONE 410 442 8289 CELL \_\_\_\_\_ FAX \_\_\_\_\_

MAILING ADDRESS 1711 Underwood Rd Sykes  
STREET CITY/TOWN STATE ZIP

APPLICANT Fogle's Septic Clean Inc.

DAYTIME PHONE 410 795-5670 CELL \_\_\_\_\_ FAX \_\_\_\_\_

MAILING ADDRESS 580 Obrecht Rd Sykes  
STREET CITY/TOWN STATE ZIP

APPLICANT'S ROLE: DEVELOPER BUILDER BUYER RELATIVE/FRIEND REALTOR CONSULTANT

PROPERTY LOCATION  
SUBDIVISION/PROPERTY NAME 1 LOT NO. \_\_\_\_\_

PROPERTY ADDRESS 1711 Underwood Rd Sykes  
STREET TOWN/POST OFFICE

TAX MAP PAGE(S) \_\_\_\_\_ GRID \_\_\_\_\_ PARCEL(S) \_\_\_\_\_ PROPOSED LOT SIZE \_\_\_\_\_

AS APPLICANT, I UNDERSTAND THE FOLLOWING: THE SYSTEM INSTALLED SUBSEQUENT TO THIS APPLICATION IS ACCEPTABLE ONLY UNTIL PUBLIC SEWERAGE IS AVAILABLE. THIS APPLICATION IS COMPLETE WHEN ALL APPLICABLE FEES AND A SUITABLE SITE PLAN HAVE BEEN RECEIVED. I ACCEPT THE RESPONSIBILITY FOR COMPLIANCE WITH ALL M.O.S.H.A. AND "MISS UTILITY" REQUIREMENTS. APPROVAL IS BASED UPON SATISFACTORY REVIEW OF A PERC CERTIFICATION PLAN.

TEST RESULTS WILL BE MAILED TO APPLICANT.

Kurt A. Cassell

SIGNATURE OF APPLICANT

HOWARD COUNTY HEALTH DEPARTMENT, BUREAU OF ENVIRONMENTAL HEALTH, WELL AND SEPTIC PROGRAM  
3525-H ELLICOTT MILLS DRIVE, ELLICOTT CITY, MARYLAND 21043-4544 (410) 313-1771 FAX (410) 313-2648  
TDD (410) 313-2323 TOLL FREE 1-877-4MD-DHMH

A/P (A)

Br Loam

1.5'  
Or Br Sand  
Red Br Sa  
Cl Loam  
Trace Rock

5' 6.5'  
Or Br Sa  
Loam Turning  
to a Beige  
Loamy Sa Deeper

9.5'  
Some Pockets  
of. Close to 50%  
Hard Rock

13'  
Bottom

(B)

Br Loam

1.5'  
Red Br Sa  
Cl Loam  
10-15% Rock

3.5'  
Large  
Vein  
of 75%  
Rock to  
Bottom

7.5'  
Hard  
Bottom

(C)

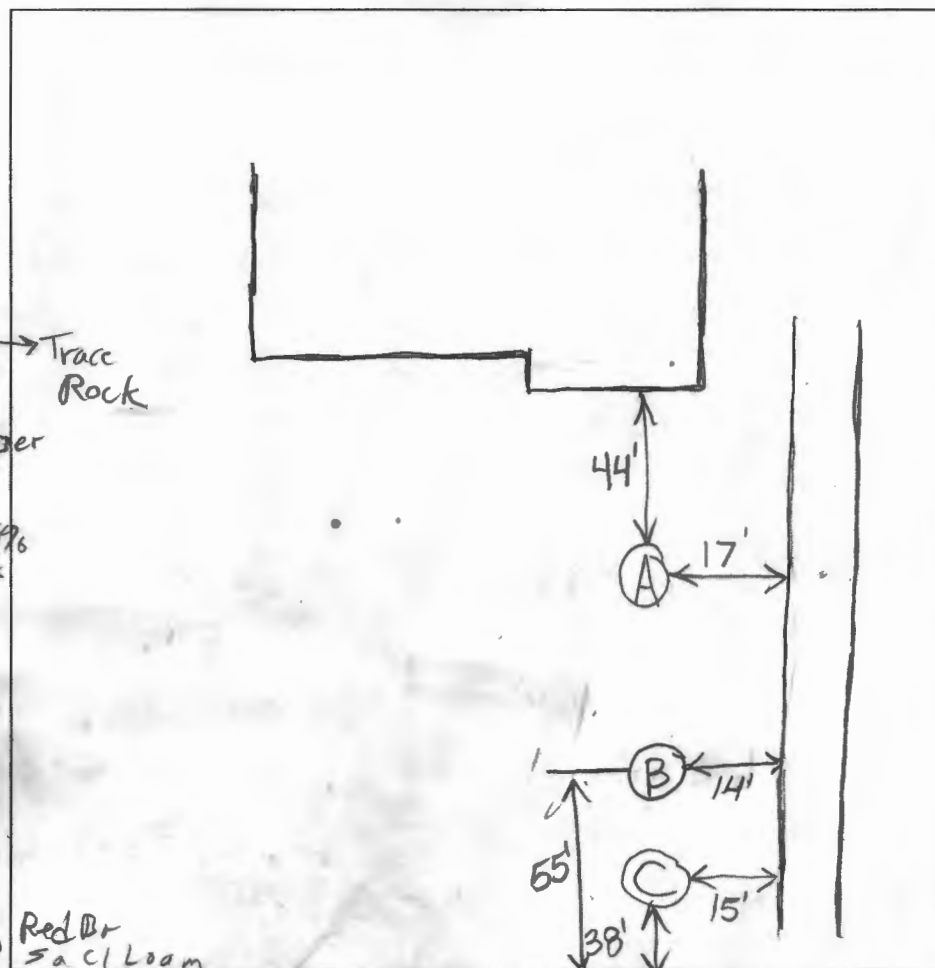
Br Loam

1.5'  
Red Br  
Sa Cl Loam  
~10% Rock  
~20% Rock

3'  
Red Br  
Sa Loam  
~10% Rock

5.5'  
Large  
Vein of  
> 50%  
Rock

9'



Down to ~5.5' Underwood Road

DATE	TEST #	DEPTH	START	BREAK 1" DROP	STOP 2" DROP	TIME OF 2nd INCH	P/F/H
6/13/07	A	6.5'/13'V	10:42:30	10:45	10:50:45	6	
	B	7.5V					
	C	9'V					

REMARKS Water Poured in Bottom of Hole A - Fast Rate

SANITARIAN B. Baker BACKHOE Fogles OTHERS

TEST HOLES USED IN SDA AVG. PERC TIME SQ. FT/BR

TRENCH WIDTH INLET DEPTH MAX. BOT DEPTH EFFECTIVE SW



# APPLICATION

## FOR PERCOLATION TESTING AND SITE EVALUATION

TEST DATE(S) \_\_\_\_\_ TEST TIME \_\_\_\_\_ A/P \_\_\_\_\_

AGENCY REVIEW: \_\_\_\_\_ DATE \_\_\_\_\_

DO NOT WRITE ABOVE THIS LINE

I HEREBY APPLY FOR THE NECESSARY TESTING/EVALUATION PRIOR TO ISSUANCE OF SEWAGE DISPOSAL SYSTEM PERMIT(S) TO:

CHECK AS NEEDED:

- ☐ CONSTRUCT NEW SEPTIC SYSTEM(S)
- ☐ REPAIR/ADD TO AN EXISTING SEPTIC SYSTEM
- ☐ REPLACE AN EXISTING SEPTIC SYSTEM

CHECK AS NEEDED:

- ☐ NEW STRUCTURE(S)
- ☐ ADDITION TO AN EXISTING STRUCTURE
- ☐ REPLACE AN EXISTING STRUCTURE

CHECK ONE:

- ☐ CREATE NEW LOT(S)
- ☐ BUILD ON AN EXISTING LOT IN A SUBDIVISION
- ☐ BUILD ON AN EXISTING PARCEL OF RECORD

IS THE PROPERTY WITHIN 2500' OF ANY RESERVOIR?

- ☐ YES
- ☐ NO

THE TYPE OF STRUCTURE IS:

- ☐ RESIDENTIAL WITH \_\_\_\_\_ PROPOSED BEDROOMS IN THE COMPLETED STRUCTURE (NOTE *UNKNOWN* IF APPROPRIATE)
- ☐ COMMERCIAL (PROVIDE DETAIL OF NUMBERS AND TYPES OF EMPLOYEES/ CUSTOMERS ON ACCOMPANYING PLAN)
- ☐ INSTITUTIONAL/GOVERNMENT (PROVIDE DETAIL OF NUMBERS AND TYPES OF EMPLOYEES/USERS ON ACCOMPANYING PLAN)

PROPERTY OWNER(S) \_\_\_\_\_

DAYTIME PHONE \_\_\_\_\_ CELL \_\_\_\_\_ FAX \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_  
STREET CITY/TOWN STATE ZIP

APPLICANT \_\_\_\_\_

DAYTIME PHONE \_\_\_\_\_ CELL \_\_\_\_\_ FAX \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_  
STREET CITY/TOWN STATE ZIP

APPLICANT'S ROLE: DEVELOPER BUILDER BUYER RELATIVE/FRIEND REALTOR CONSULTANT

PROPERTY LOCATION  
SUBDIVISION/PROPERTY NAME \_\_\_\_\_ LOT NO. \_\_\_\_\_

PROPERTY ADDRESS \_\_\_\_\_  
STREET TOWN/POST OFFICE

TAX MAP PAGE(S) \_\_\_\_\_ GRID \_\_\_\_\_ PARCEL(S) \_\_\_\_\_ PROPOSED LOT SIZE \_\_\_\_\_

AS APPLICANT, I UNDERSTAND THE FOLLOWING: THE SYSTEM INSTALLED SUBSEQUENT TO THIS APPLICATION IS ACCEPTABLE ONLY UNTIL PUBLIC SEWERAGE IS AVAILABLE. THIS APPLICATION IS COMPLETE WHEN ALL APPLICABLE FEES AND A SUITABLE SITE PLAN HAVE BEEN RECEIVED. I ACCEPT THE RESPONSIBILITY FOR COMPLIANCE WITH ALL M.O.S.H.A. AND "MISS UTILITY" REQUIREMENTS. APPROVAL IS BASED UPON SATISFACTORY REVIEW OF A PERC CERTIFICATION PLAN.

TEST RESULTS WILL BE MAILED TO APPLICANT.

SIGNATURE OF APPLICANT \_\_\_\_\_

HOWARD COUNTY HEALTH DEPARTMENT, BUREAU OF ENVIRONMENTAL HEALTH, WELL AND SEPTIC PROGRAM  
3525-H ELLICOTT MILLS DRIVE, ELLICOTT CITY, MARYLAND 21043-4544 (410) 313-1771 FAX (410) 313-2648  
TDD (410) 313-2323 TOLL FREE 1-877-4MD-DHMH

AP (D)

0.5'-1' Topsoil

2' Br Loam

3' Or Br Sa CI Loam

6' Red Br Sa CI Loam

7' Red Br Sa Loam

7' >50% Rock Hard Bottom

8' (E)

1' Topsoil

Or Br Sa CI Loam

2.5'-3' Red Br Sa CI Loam

6' >50% Rock Hard Bottom

7' (F)

0.5'-1' Topsoil

1.5' Br Loam

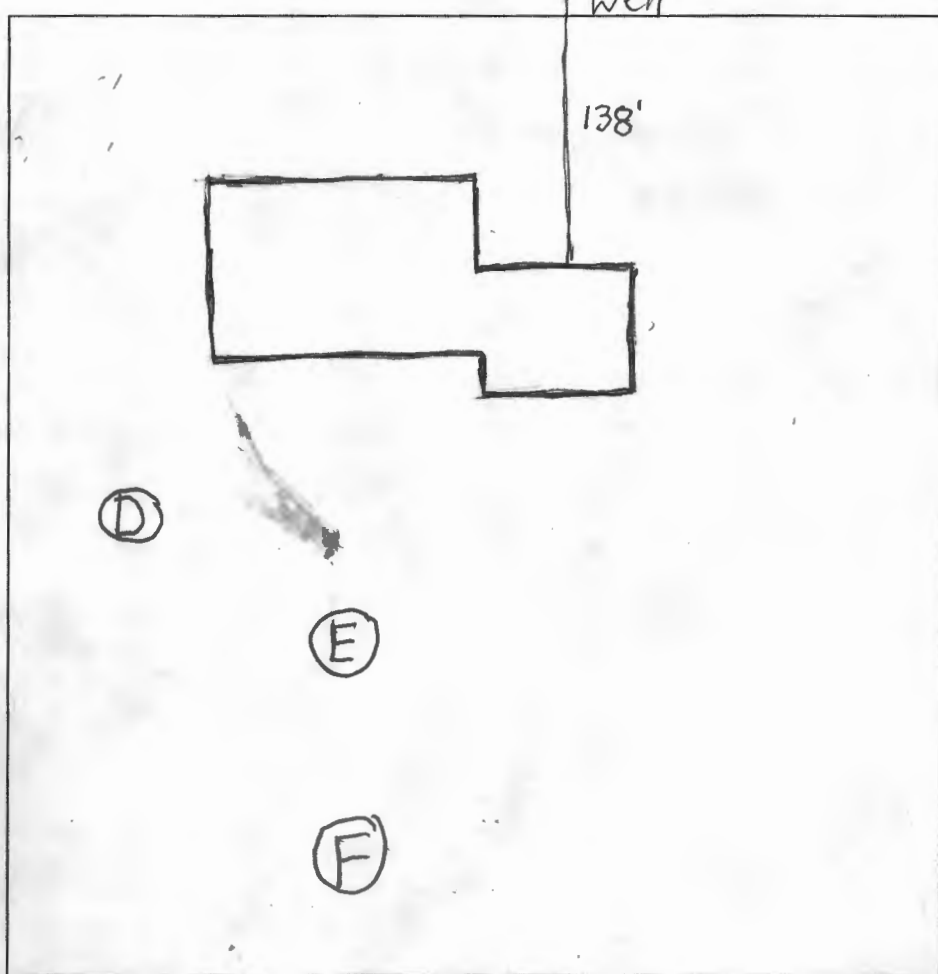
Or Br Sa CI Loam

3' Red Br Sa CI Loam

30-40% Rock Below 6'

7' >50% Rock Hard Bottom

7.5'



(G)

Topsoil 1'

Br Loam 0.5'-1'

Or Br Sa CI Loam 2.5'-3'

Red Br Sa CI Loam 30-40% Rock Deep 8.5'

>50% Rock Hard Bottom 9.5'

DATE	TEST #	DEPTH	START	BREAK 1" DROP	STOP 2" DROP	TIME OF 2nd INCH	P/F/H
6/25/07	D	3'/8" V	10:47:30	12:04	For 1st Inch		
	E	7' V					
	F	2' / 7.5' V	12:19:30	12:24:15	12:32:15	8	
		3' / 7.5' V	12:40	1:06	1:38:30	32 1/2	
		11" V	1:17:30	1:21	1:29	8	
	G	9.5' V					

REMARKS \_\_\_\_\_

SANITARIAN B. Baker BACKHOE Fogles OTHERS \_\_\_\_\_

TEST HOLES USED IN SDA \_\_\_\_\_ AVG. PERC TIME \_\_\_\_\_ SQ. FT/BR \_\_\_\_\_

TRENCH WIDTH \_\_\_\_\_ INLET DEPTH \_\_\_\_\_ MAX. BOT DEPTH \_\_\_\_\_ EFFECTIVE SW \_\_\_\_\_





INNOVA, LTD

INNOVATIVE WASTEWATER TREATMENT SYSTEMS

P.O. BOX 363, NEW WINDSOR, MD 21776

(410) 875-9370 Office

(410) 635-2883 Fax  
H. Dale Gray, Principal

# WASTEWATER DISPOSAL SYSTEM

Project Title: LEWIS PROPERTY

Address: 1711 UNDERWOOD ROAD

SYKESVILLE, MD (HOWARD COUNTY) 21784

OK Gary *[Signature]* 11-6-07

10/18/2007

Note: Revision

Lewis Property

1711 Underwood Road Sykesville MD

Page 10

Please replace indicated perforated end caps with drilled elbow/turn up



LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
SYKESVILLE, MARYLAND 21784

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	WASTEWATER SYSTEM, PLAN VIEW (SCALE 1":20')
2	WASTEWATER SYSTEM, PROFILE VIEW (SCALE, HORIZONTAL: 1" =10', VERTICAL: 1" = 2')
3	OVERVIEW / DISCUSSION
4	DISTRIBUTION SYSTEM / PUMP SELECTION AND PUMP CURVES
5	DISPOSAL FIELD PLAN AND PROFILE VIEW
6	SYSTEM ELEVATIONS / DRAWING WASTEWATER PRETREATMENT UNIT CONTAINMENT TANK
7	DRAWING OF WASTEWATER PRETREATMENT UNIT [HOOT H-600A]
8	PUMP CHAMBER / FLOAT SETTINGS AND INSTALLATION NOTES
9	SIMPLEX CONTROL PANEL (NEMA 4X) [230 V, single phase/control panel / 3 float switches] & INSTALLATION NOTES
10	DISTRIBUTION PIPING / DRILLING MENU 5/16" PERFORATIONS
11	CONSTRUCTION PROCEDURES (ADAPTED TO SHALLOW IN-GROUND DISPOSAL BED)

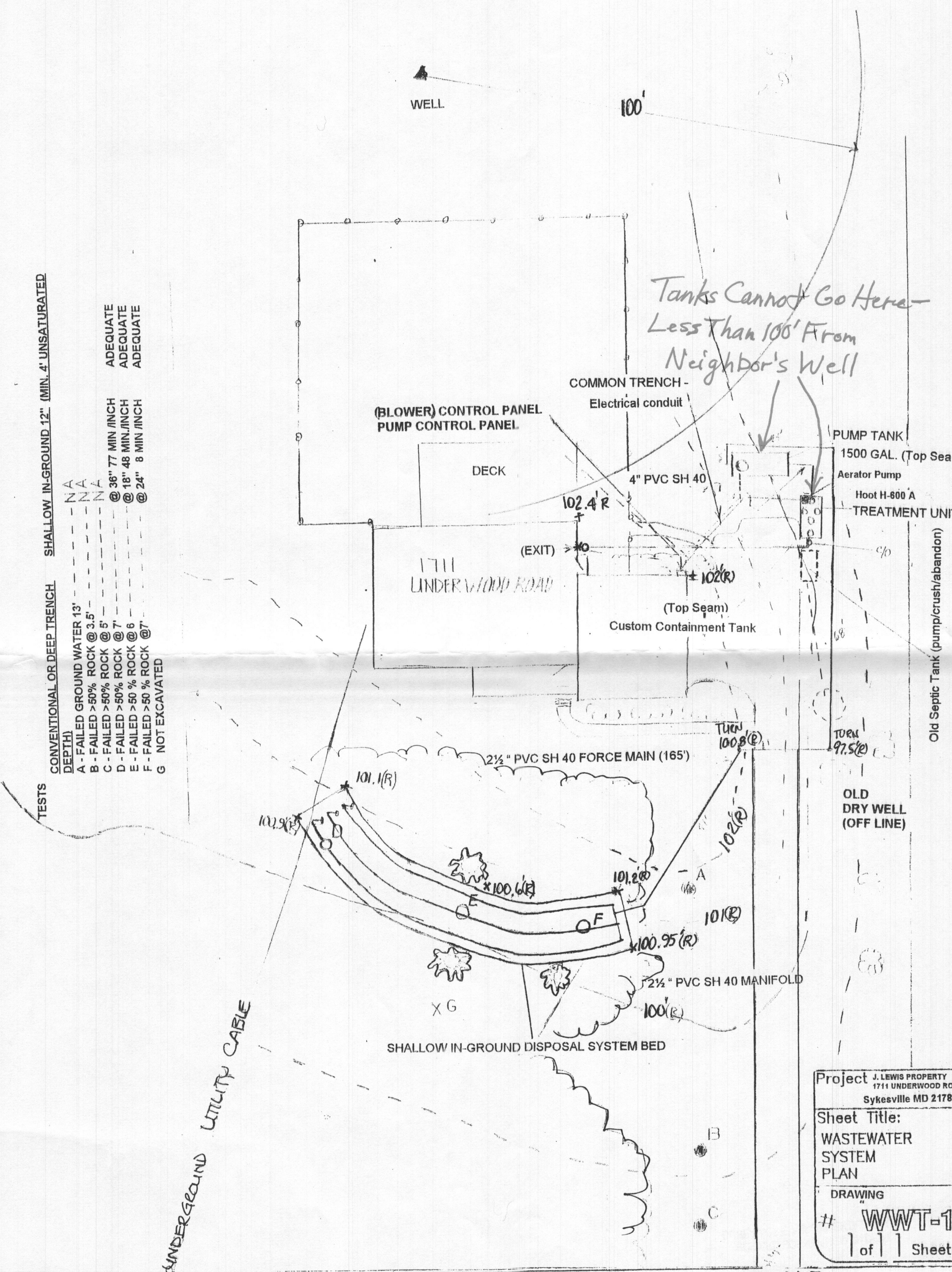
OCTOBER 18, 2007



10/12/07  
1" = 20'

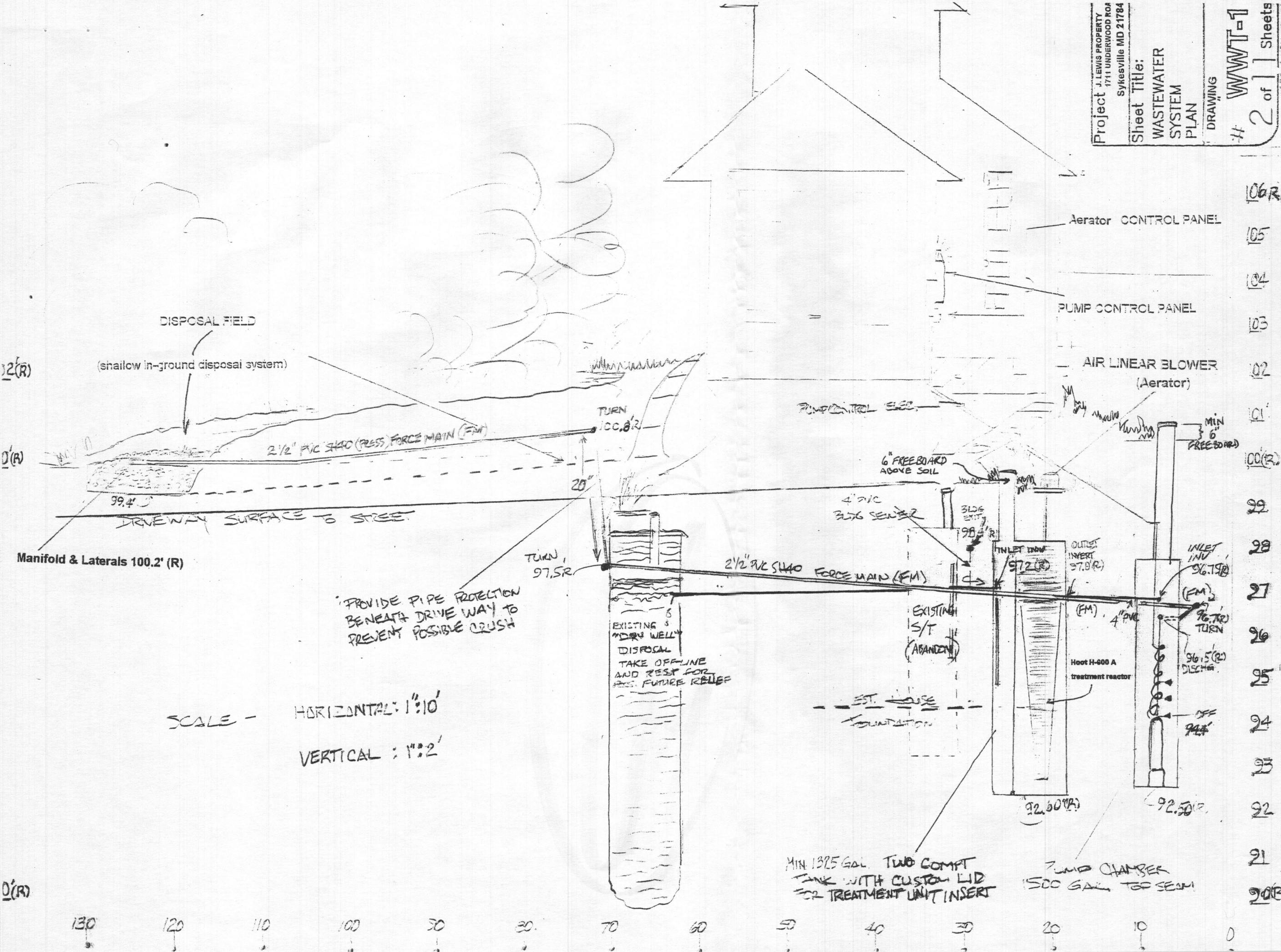


**INNOVA, LTD**  
**INNOVATIVE WASTEWATER TREATMENT SYSTEMS**  
P.O. BOX 363, NEW WINDSOR, MD 21776  
(410) 875-9370. Office  
(410) 635-2883 Fax  
H. Dale Gray, Principal



Project J. LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
Sykesville MD 21784  
Sheet Title:  
WASTEWATER  
SYSTEM  
PLAN  
DRAWING  
# WWT-1  
1 of 1 Sheets





Project J. LEWIS PROPERTY  
 1711 UNDERWOOD ROAD  
 Sykesville MD 21784  
 Sheet Title:  
 WASTEWATER  
 SYSTEM  
 PLAN  
 DRAWING  
 # WWT-1  
 2 of 1 Sheets

INNOVA, LTD  
 INNOVATIVE WASTEWATER TREATMENT SYSTEMS  
 P.O. BOX 363, NEW WINDSOR, MD 21776  
 (410) 875-9370 Office  
 (410) 635-2883 Fax  
 H. Dale Gray, Principal

Date: 10/18/07  
 Scale: 1" = 10' AS SHOWN



LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
SYKESVILLE, MD 21784

## OVERVIEW / DISCUSSION

### OVERVIEW

A dry well, soil disposal pit has been serving the property's 30+ year old, four bedroom home since the home was constructed. Recently, it has become evident that the dry well has failed, causing the owner to periodically pump the dry well and septic tank to avoid wastewater breakout. The home, fronting on Underwood Road, is located on a 1.3 acre lot, gently sloping [1 - 2.5%] from rear boundary to Underwood Road.

Representatives of Howard County's Bureau of Environmental Health (HCBEH), the approving authority, and the Maryland Department of the Environment (MDE) Area Sanitarian evaluated site soil infiltration rates ["perc" testing], and soils capability observations (soil profiles). Based on the observations, and test results requirements for a new wastewater system were stipulated by HCBEH as necessary for a wastewater disposal system approval.

### PRETREATMENT [CONTAMINANT REDUCTION] OF SITE WASTEWATER

is needed due to reduced water disposal characteristics of the soil, and limited amount of useable disposal area available on the site. Just as important, a need to protect, and extend the use-life of the area/soil that is available.

### USE OF A NON-CONVENTIONAL SOIL DISPOSAL SYSTEM

referring to observed conditions of soil depth, and structure, conventional trench disposal was considered not feasible. It is necessary to satisfy the MD State standard four (4') foot depth of continually dry (unsaturated), non-rock laden soil below the point of proposed wastewater introduction. The requirement is satisfied using a shallow in-ground gravel disposal bed (12" depth - unsaturated soil depth 4+ feet), dosed by low pressure application of treated wastewater (effluent) over the bed [of all tests observed, Test Pit "E" with a rock limitation beginning at a 6' depth was the most limiting (shallow) depth observation in the Disposal Area].

### DISCUSSION

Site testing and evaluation located useable soil disposal in front of the home, in a wooded area. Vegetation understory in the area is moderately open, and clear except, along the edges. The bed structure describes a gentle bow-like curvature along contour. The designated disposal bed reaches 75' across the lot (along contour) with a width of 13', and extends between two large trees near the bed center. The area, as indicated is generally open except for two, possibly three small trees (6" dia. ) that may need to be cut off at ground level.

The owner hopes to protect the large trees from harm (root damage/suffocation) caused by excavation and excessive soil depth burial of root systems during disposal bed construction and soil cap grading. The problem can be reduced substantially by not burying that part of the native soil surface (with cap grading soil), adjacent to the tree trunks. When excavating the disposal bed between the large trees, hand excavation should be employed to reduce major root system damage by not severing root runners.

The original septic tank, assumed to be a 1250 gallon, mid-seam tank (commonly used in the 1970's) must be pumped/cleaned to HCBEH standards, and rendered no longer useable, and safe. A new, custom built, top seam tank (min size 1325 gal.) will receive building sewer discharge in the trash/grit interceptor (400 gallon) compartment passing sewage (influent) to the 920 gallon (min.) compartment for treatment by means of a Floot Aerobic Systems, Inc.\* aeration treatment unit. At estimated wastewater strength of 220 mg/L BOD<sub>5</sub> (organic contamination), and average daily flow of 300 gallons the BOD<sub>5</sub> discharge is anticipated to be less than 10 mg/l and Total Nitrogen reduced about 70%, from an estimated 40 mg/L to about 12 mg/L. Based on reduced levels of organic contamination and even distribution of the treated wastewater across the Bed, the system is designed to maximize the useful life of the disposal area.

The original, now failed, Dry Well Disposal Pit should be put into a rest condition, but not abandoned. The Dry Well pit is considered the property's alternative (future) disposal application, to be used in the event that this shallow in-ground disposal bed fails. Introduction (future) of treated wastewater to the Dry Well would be a positive, renovating factor, but re-use of the Dry Well, in the future would require HCBEH approval before reconnecting to that system.

\* revision 10/18/2007

Project	J. LEWIS PROPERTY 1711 UNDERWOOD ROAD Sykesville MD 21784
Sheet Title:	WASTEWATER SYSTEM PLAN
DRAWING	
#	WWT-1
3 of 1	1 Sheets



INNOVA, LTD  
INNOVATIVE WASTEWATER TREATMENT SYSTEMS  
P.O. BOX 363, NEW WINDSOR, MD 21776

(410) 875-9370 Office

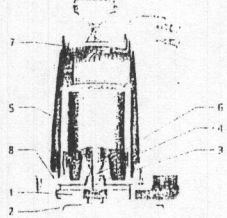
(410) 635-2883 Fax  
H. Dale Gray, Principal

scale: 1" = 10'



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



Submersible Effluent Pump

MODEL 3885

WE Series

MODELS

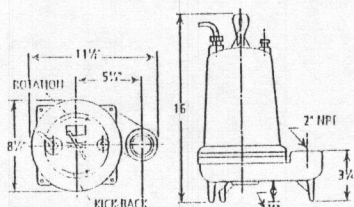
Order No.	HP	Volts	Phase	Max. Amp.	RPM	Solids	Wt. (lbs.)
WE0311L	1/2	115		10.7			
WE0318L	1/2	208		6.8			
WE0312L	1/2	230		4.9			
WE0311M	1/2	115	1	10.7	1750		56
WE0318M	1/2	208	1	6.8			
WE0312M	1/2	230	1	4.9			
WE0311H	1/2	115		14.5			
WE0318H	1/2	208		8.1			
WE0312H	1/2	230		7.3			
WE0338H	3/4	200		4.9			
WE0332H	3/4	230	3	3.3			
WE0341H	3/4	460		1.7			
WE0371H	1	575		1.4			
WE0311H1	1/2	115		14.5			
WE0318H1	1/2	208	1	8.1			
WE0312H1	1/2	230	1	7.3			
WE0338H1	3/4	200		4.9			
WE0332H1	3/4	230	3	3.6			
WE0341H1	3/4	460		1.8			
WE0371H1	1	575		1.5			
WE0718H	1	208	1	11.0			
WE0712H	1	230		10.0			
WE0738H	1 1/2	200		6.2			
WE0732H	1 1/2	230	3	5.4			
WE0734H	1 1/2	460		2.7			
WE0737H	1 1/2	575		2.2			
WE1018H	2	208	1	14.0			
WE1012H	2	230		12.5			
WE1038H	2 1/2	200		8.1			
WE1032H	2 1/2	230	3	7.0			
WE1034H	2 1/2	460		3.5			
WE1037H	2 1/2	575		2.8			
WE1518H	3	208	1	17.5			
WE1512H	3	230		15.7			
WE1538H	3 1/2	200		10.6			
WE1532H	3 1/2	230	3	9.2			
WE1534H	3 1/2	460		4.6			
WE1537H	3 1/2	575		3.7			
WE1518H1	3	208	1	17.5			
WE1512H1	3	230		15.7			
WE1538H1	3 1/2	200		10.6			
WE1532H1	3 1/2	230	3	9.2			
WE1534H1	3 1/2	460		4.6			
WE1537H1	3 1/2	575		3.7			
WE2012H	4	230	1	18.0			
WE2038H	4 1/2	200		12.0			
WE2032H	4 1/2	230	3	11.6			
WE2034H	4 1/2	460		5.8			
WE2037H	4 1/2	575		4.7			

PERFORMANCE RATINGS (gallons per minute)

Order No.	WE0311L	WE0318L	WE0312L	WE0311M	WE0318M	WE0312M	WE0311H	WE0318H	WE0312H	WE0338H	WE0332H	WE0341H	WE0371H
HP	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	1
WPM	1750	1750	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
5	86	63	78	94	103	128	53	93	138	136	133	130	121
10	70	52	60	83	98	123	49	90	136	126	121	110	103
15	57	43	50	67	82	103	41	80	126	116	110	103	96
20	47	35	40	55	74	95	34	77	121	110	103	96	89
25	39	28	33	45	64	86	28	74	116	110	103	96	81
30	32	23	27	37	53	77	23	70	110	103	96	81	74
35	27	19	22	31	45	67	19	66	103	96	81	74	67
40	23	16	19	26	37	56	16	63	96	81	74	67	60
45	20	14	17	23	33	49	14	58	89	74	67	60	55
50	17	12	15	20	29	41	12	51	81	67	60	55	51
55	15	11	13	18	26	37	11	47	74	60	55	51	47
60	13	10	12	16	23	33	10	43	66	55	51	47	43
65	11	9	11	14	20	29	9	39	58	49	43	39	37
70	10	8	10	13	18	26	8	36	53	45	39	37	34
75	9	7	9	12	17	24	7	33	49	41	36	34	31
80	8	6	8	11	16	22	6	30	45	38	33	31	28
85	7	5	7	10	15	20	5	28	41	35	30	28	26
90	6	4	6	9	14	19	4	26	38	32	27	26	24
95	5	3	5	8	13	18	3	24	35	30	25	24	22
100	4	3	4	7	12	17	2	22	32	28	23	22	20

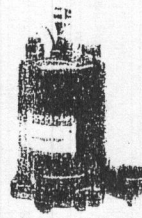
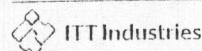
DIMENSIONS

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



Goulds Pumps is a brand of IIT Water Technology, Inc. - a subsidiary of IIT Industries, Inc. Goulds Pumps and the IIT Engineered Blocks Symbol are registered trademarks and tradenames of IIT Industries.

Goulds Pumps



Submersible Effluent Pump

MODEL 3885

WE Series

PROSURANCE AVAILABLE FOR RESIDENTIAL APPLICATIONS.

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump

- Solids handling capabilities: 1/2" 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.

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.

MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on 1/2-1 1/2 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.
- SLOW or SLOW severe duty oil and water resistant power cords.
- 1/2 - 1 HP models have NEMA three prong grounding plugs.
- 1 1/2 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.
- SLOW 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.

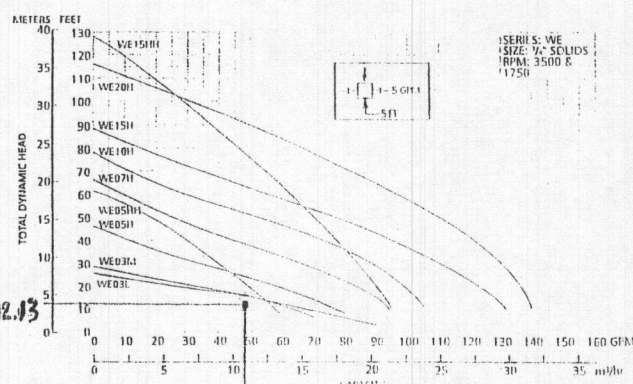
- Bearings: Upper and lower heavy duty ball bearing construction.

■ 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 #131549 Goulds Pumps is ISO 9001 Registered.



Goulds Pumps



LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
SYKESVILLE, MD 21784

DISTRIBUTION CONFIGURATION / PUMP SIZING

Flow = 4 Bedroom Home

Design Flow: 600 gal./ day Average Daily Flow: 300 gal./ day

Disposal Specified = Soil Loading Rate: @ 0.6 gpd/ft<sup>2</sup>

Shallow In-ground Gravel Bed 75' long, on contour  
13' wide, perpendicular to contour

MDE Specified Distribution Elements: [Pipe materials PVC Sh 40 (press. rated)]

- Type of Lateral Feed = End Feed
- Laterals (quantity) = 3
- Lateral Pipe Length = 70'
- Pipe Diameter = 2"
- Lateral/Lateral spacing = 4' 4"
- Lateral/Bed edge spacing = 2' 2"
- Bed Ends Set Back = 2' 6"
- Perforation Dia. = 5/16" (1.63 gpm @ 2' hydraulic head)
- Perforation spacing = 7' 6" (acceptable for 2" pipe at 70' length)
- Lateral perforations = 10
- Discharge rate = 16.3 gpm./lateral [1.63 X 10]
- X 3 laterals = 49 gpm, system discharge rate

DOSE VOLUME [individual event] = 226.5 gallons\*

The greater of: (A). peak flow gal +6 or (B) 5X vol. of 2" laterals + vol. of 2 1/2" forcemain /manifold (F/M)

(A) = 100 gal. (600 +6)

2" pipe = 17.4 gal./100' 2 1/2" pipe = 24.9 gal./100'

(B) = 246.4 gal. 210' lateral pipe X 17.4 gal/100' pipe X 5 = 182.7 gal. + (175' F/M) 43.8 gal.

\* Revised 10/18/2007: Force main piping- freeze protection drain-down. Add 43.5 gallons to compensate dose for drain back volume, 29.2 gal. (117' pipe) . Pump: 255.7 gal. Deliver: 226.5 gal.

PUMP SIZING

TDH [TOTAL DYNAMIC HEAD]  
Static Head: Manifold less Pump Off 100.2' (R) - 94.33' (R) = 5.87'

Equivalent/Piping/Fittings

Friction Head [2 1/2" pipe @ 49gpm] value: 1.75' vert. ft./ 100' length  
Force Main: 167' + Manifold 8' = 175' - 1.75 X 1.75 = 3.06'

2 1/2" Fittings:

5 - 90° ells @ 8', 1 - 45° ell @ 5'

6 - cplngs @ 2.5', 1 - HP gate vlv @ 1.6' = 61.6'

Thus: 1.75 X .616 = 1.08'

2.00' = 2.00'

TOTAL DYNAMIC HEAD 12.13'

PUMP SELECTION

Enter Pump Curves @ 49 gal./min and TDH of 12.13'

Project J. LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
Sykesville MD 21784

Sheet Title:  
WASTEWATER  
SYSTEM  
PLAN

DRAWING

# WWT-1  
4 of 1 Sheets

ite: 10/12/07

ale: 1" = NA



INNOVA, LTD

INNOVATIVE WASTEWATER TREATMENT SYSTEMS

P.O. BOX 363, NEW WINDSOR, MD 21776

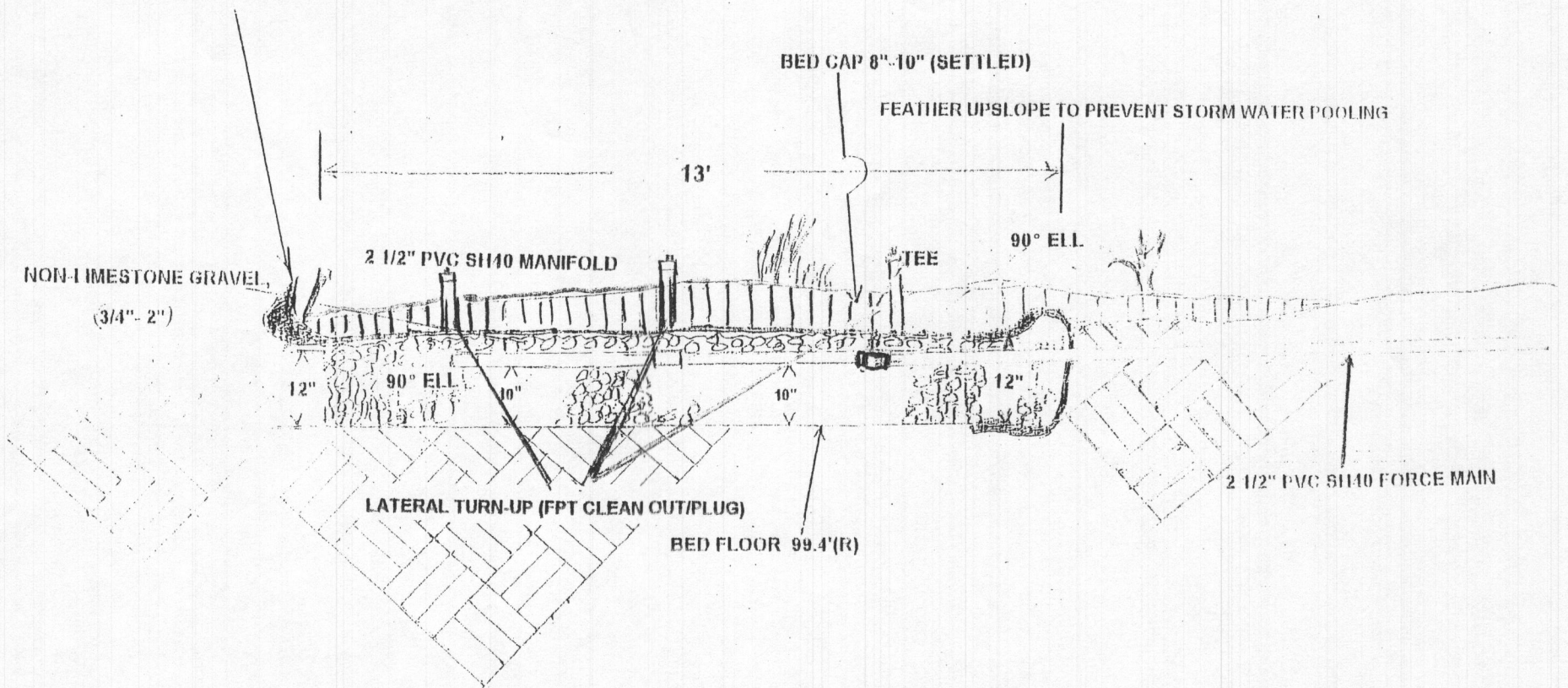
(410) 875-9370 Office

(410) 635-2883 Fax

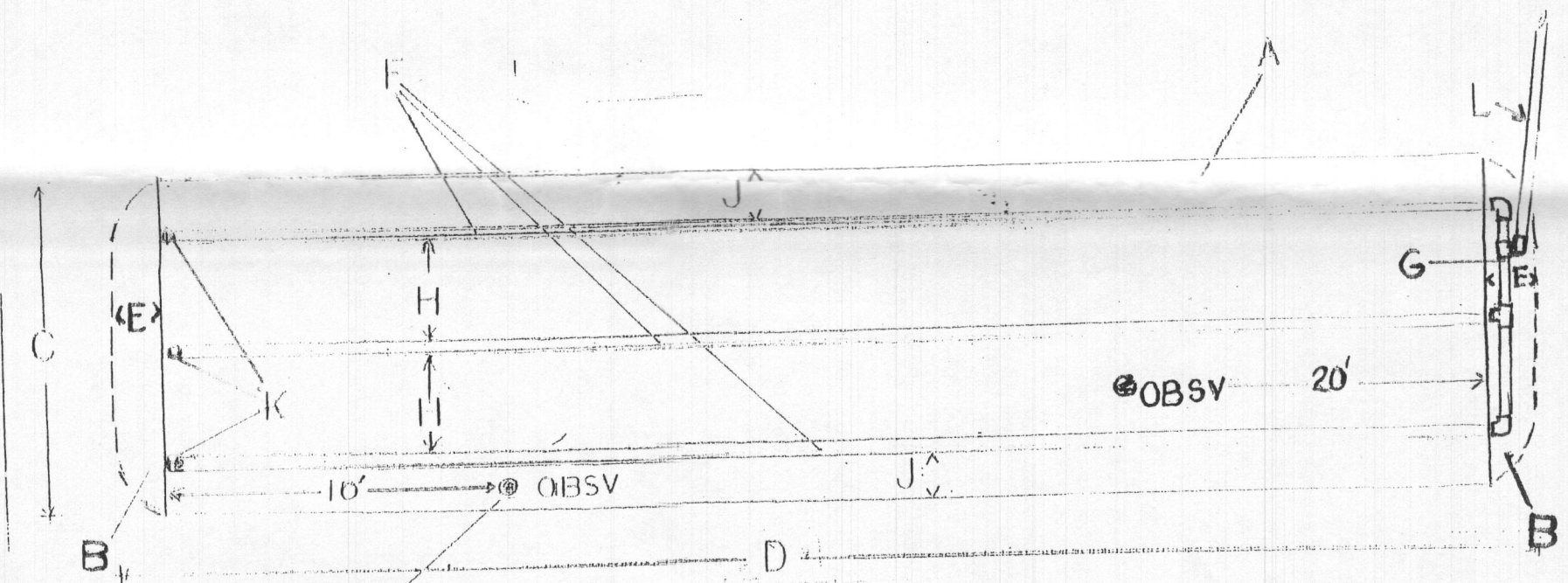
H. Dale Gray, Principal



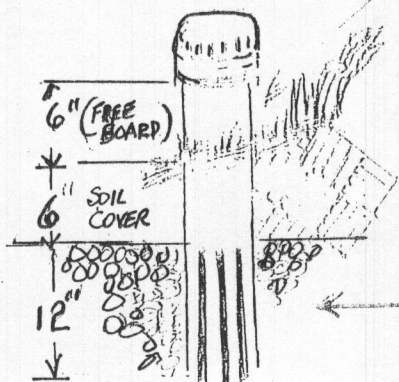
SPUN GEOTEXTILE FABRIC (BED COVER)  
 SECURE FABRIC BY PLACING AN 18" FLAP ON FLOOR OF BED ALONG UPSLOPE SIDE AND ANCHOR BY  
 PLACING THE STONE IN THE BED - FOLD AND COVER ENTIRE BED BEFORE PLACING TOPSOIL CAP COVER.  
 SECURELY STAKE THE FABRIC ON THE DOWN SLOPE SIDE OF BED BEFORE FINISH GRADING



**END VIEW PROFILE**  
**SHALLOW IN-GROUND ABSORPTION BED**  
 SCALE AS SHOWN



SCALE AS SHOWN



- |                                     |  |
|-------------------------------------|--|
| A Absorption Bed 13'W X 75' L       | F 2\" PVC, Lateral [Sh 40- press.] length 70'          |
| B Piping Support Pad 13' W X 2.5' L | G 2 1/2\" PVC Manifold (end feed) 8' 8"                |
| C Bed Width 13'                     | H Lateral separation 4' 4"                             |
| D Bed Length 75'                    | J Bed Side set back 2' 2"                              |
| E Bed End pipe set back 2.5'        | K Lateral pipe turn up                                 |
|                                     | L 2 1/2\" PVC Force Main [Sh 40- press.]               |
|                                     | OBSV 4\" PVC capped observation pipe (slotted base)(2) |

**PLAN VIEW**  
**SHALLOW IN-GROUND ABSORPTION BED**

Project J. LEWIS PROPERTY  
 1711 UNDERWOOD RD  
 Sykesville MD 21781

Sheet Title:  
 WASTEWATER  
 SYSTEM  
 PLAN

DRAWING

# WWT-1  
 5 of 1 Sheet



**INNOVA, LTD**  
**INNOVATIVE WASTEWATER TREATMENT SYSTEMS**

P.O. BOX 363, NEW WINDSOR, MD 21776

(410) 875-9370 Office

(410) 635-2883 Fax

H. Dale Gray, Principal

Date: 10/18/07

Scale: AS SHOWN  
 1\"/>



LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
SYKESVILLE, MD 21784

**SYSTEM ELEVATIONS** [Bench - driveway edge @ existing Septic Tank = 100'R]  
Native Surface      System Element

Building Sewer Exit      102.4' R  
OLD Septic Tank Inlet      100.0'R

Pipe- 98.4' R  
Pipe(Invert) 97.0' R

**NEW SYSTEM**

Septic/Treatment Tank      100' R

Top      98.25' R  
Inlet Inv      97.25' R  
Outlet Inv      97.0' R  
Floor      92.87' R  
Base      92.5' R  
Top      98.72' R  
Inlet      96.75' R  
Discharge      96.50' R  
Turn      96.50' R  
Turn      96.74' R  
Turn      97.5' R  
Turn      100.8' R

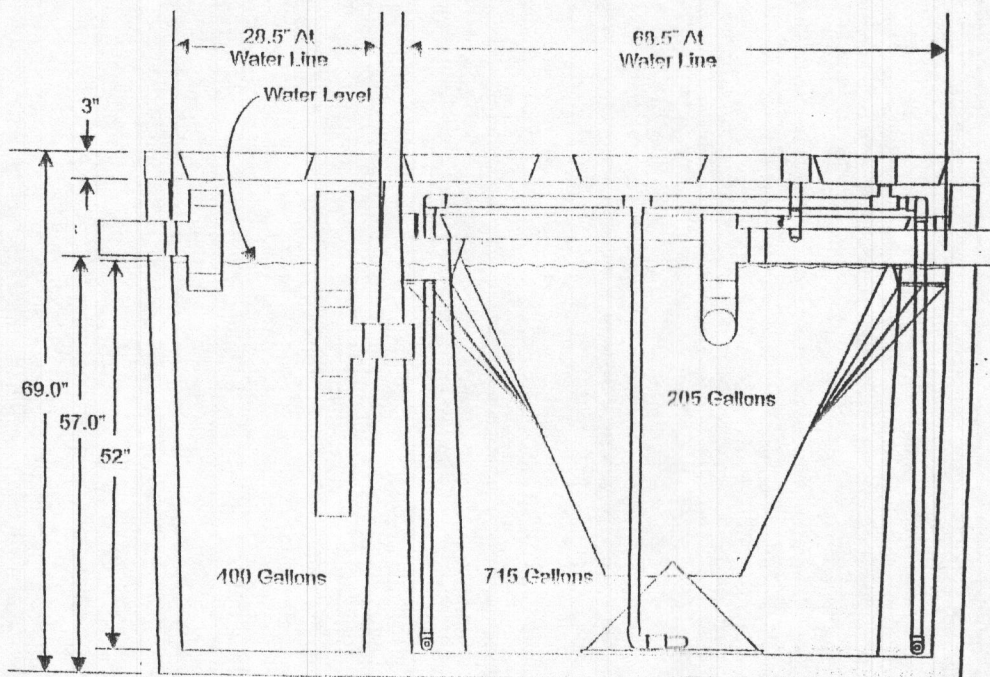
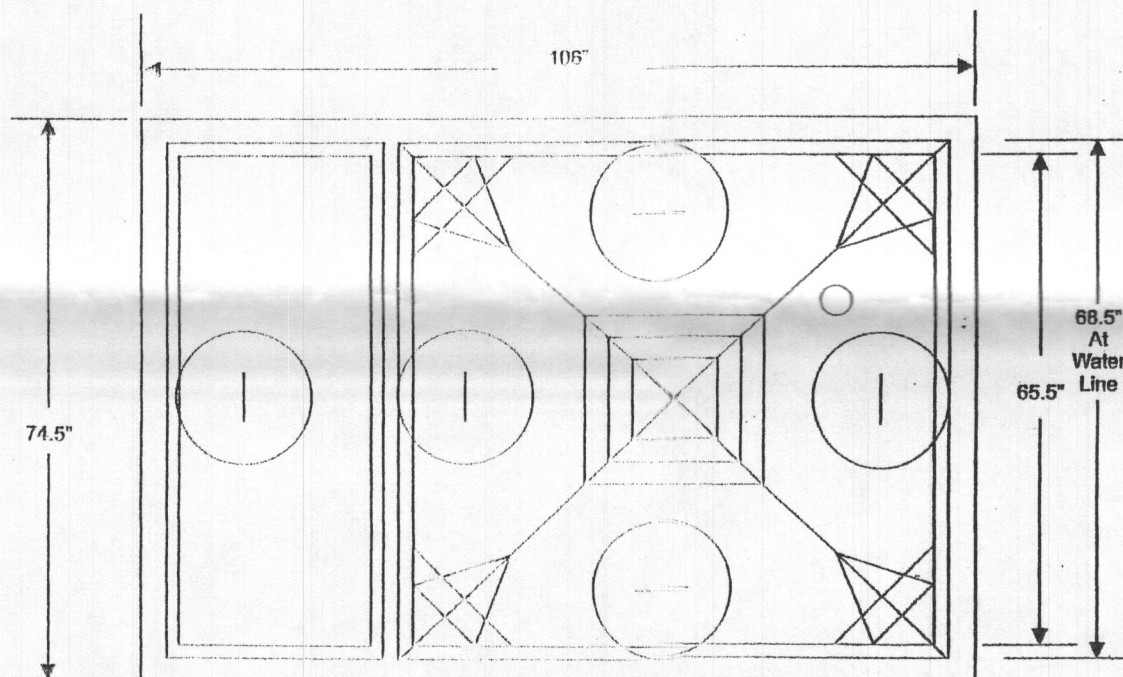
Pump Chamber (Tank)      99.7' R

2 1/2" Force Main

Bed [12" gravel depth, max.]  
2 1/2" PVC Distribution Manifold  
2" PVC Lateral(s)  
Bed Top (surface)  
Soil Cap [8"-10", unconsolidated]

Floor      99.4' R  
Pipe      100.2' R  
Pipe      100.2' R  
Gravel      100.4' R  
Soil      101.2' R

**600 GPD GRAVITY DISCHARGE SYSTEM**  
**H-600 A**



2.229' Avg. Length  
5.600' Avg. Width  
4.333' Depth

Project J. LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
Sykesville MD 21784

Sheet Title:  
WASTEWATER  
SYSTEM  
PLAN

DRAWING

# WWT-1

6 of 11 Sheet



**INNOVA, LTD**  
**INNOVATIVE WASTEWATER TREATMENT SYSTEMS**

P.O. BOX 363, NEW WINDSOR, MD 21776

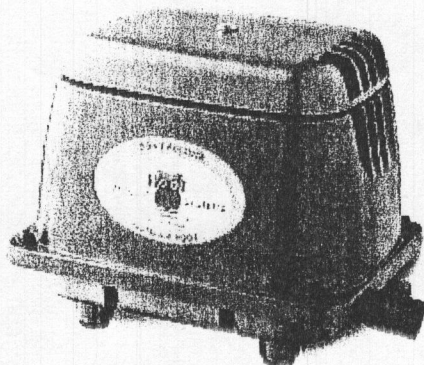
(410) 875-9370 Office

(410) 635-2883 Fax

H. Dale Gray, Principal

10/18/07  
AS SHOWN  
1" = 1'

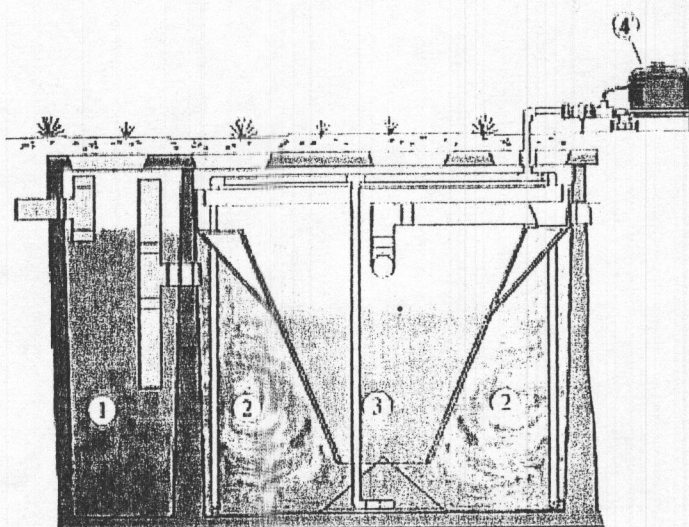




## THE TROY AIR BLOWER

Oxygen, key to the Aerobic Treatment Process, is supplied by the Troy Air Linear Blower, a very quiet, energy efficient linear air pump.

It is so quiet; most people standing next to it find it difficult to hear! It uses less electricity than a 150 watt light bulb and less than 1/3 the electricity required by louder carbon vane pumps saving you hundreds of dollars per year over the competition.



### Hoot Aerobic System

H 600 A

#### 600 GPD GRAVITY DISCHARGE SYSTEM

- 1 Pretreatment (trash collection chamber) chamber, receives sewage from house and passes this effluent to the aeration chamber.
- 2 Aeration Chamber, oxygen pumped into wastewater
- 3 Clarifier Chamber where clear odorless effluent rises and is discharged to the Pump Tank
- 4 Linear Air Blower 115 V 30 AMP BLOWER MAY BE LOCATED WITHIN 50' OF TREATMENT UNIT

Project J. LEWIS PROPERTY 1711 UNDERWOOD ROAD Sykesville MD 21784	
Sheet Title: WASTEWATER SYSTEM PLAN	
DRAWING	
#	WWT-1
7 of 1	1 Sheets



**INNOVA, LTD**  
**INNOVATIVE WASTEWATER TREATMENT SYSTEMS**

P.O. BOX 363, NEW WINDSOR, MD 21776  
(410) 875-9370 Office

(410) 635-2883 Fax  
H. Dale Gray, Principal

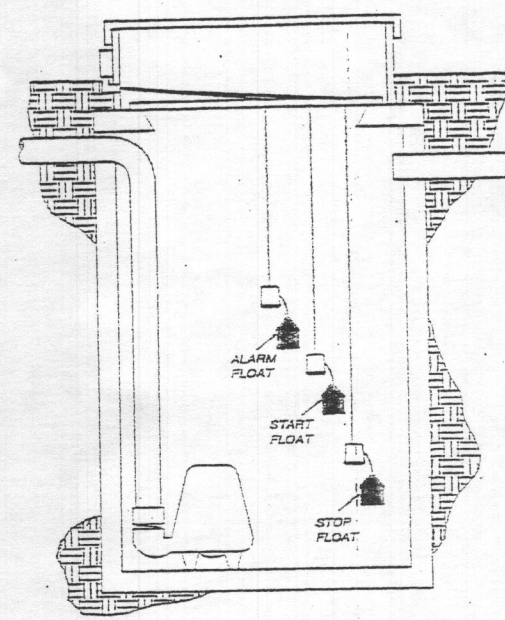
10/28/01



INSTALLATION INSTRUCTIONS - Page 2  
Control switches with external weights



Figure 1 - Three Float Installation



MANUAL TESTING (To simulate simplex operation sequence).

For ease of installation and safety reasons, we recommend manual testing of float switch operation prior to attaching floats to discharge pipe in the pump chamber.

1. Make sure all float switches are in off position. SEE FIGURE 2.
2. Turn on power source. The control panel control switch should be on and the HOA switch should be in automatic position.
3. Tip stop float to on position.
4. While stop float remains tipped, tip start float to on position. At this point the pump and pump run light will turn on.
5. Return start float to off position. Return stop float to off position. Pump and pump run indicator light will now be off.
6. To test alarm operation, tip alarm float to on position. The red light and horn should be activated.

NOTE: UNIT SHOULD BE PERIODICALLY TESTED TO INSURE PROPER OPERATION.

Mounting Control Switches

CAUTION: Do not begin installation in pump chamber until all power source circuit breakers have been turned off. For added safety also turn off the control switch and the HOA switch. Failure to turn off power could result in serious or fatal electrical shock.

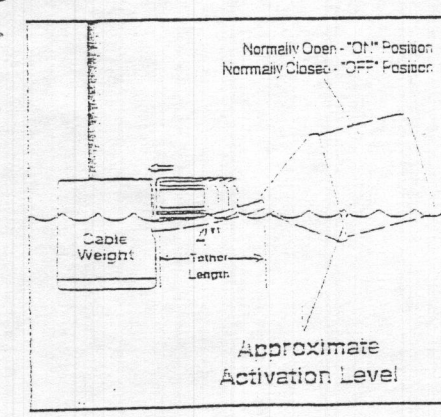
Cable Weight (Figure 2)

1. Lay cable in weight channel.
2. Align clip with weight groove and slide towards cable.
3. Snap clip snugly up to cable, manually moving clip to the tightest possible position.
4. Wire cable leads directly into control device.
5. Suspend unit at desired activation level. See Figure

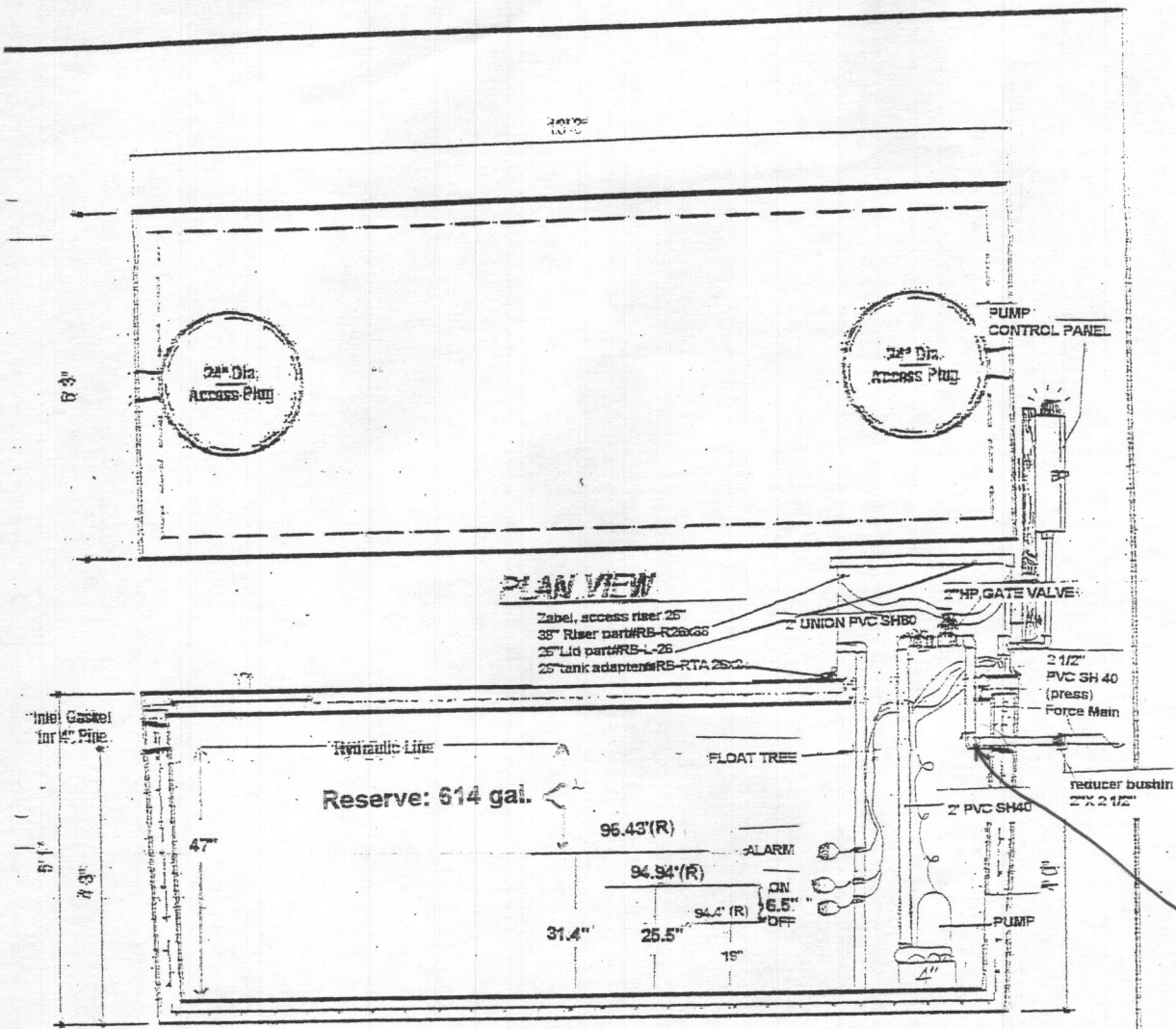
Float Switch Specifications:

Sensor Float® control switch. HOUSING: 3.38 in. (8.58 cm.) diameter x 4.55 in. (11.56 cm.) long, high impact resistant, non-corrosive PVC plastic for use in liquids up to 140° F (60°C). CABLE: 16 gauge, 2 conductor SJOW-A (UL), SJOW (CSA) water resistant Neoprene.

Figure 2



need 5/16" or 1/4" w/rod hole in bottom of box



SECTION AA

DESIGN DATA & GENERAL NOTES

- 1) Concrete strength: f<sub>c</sub> = 4,000 p.s.i. @ 28 days. Density = 150 pcf.
- 2) Cement - Portland Type III per ASTM C 150-92.
- 3) Admixtures & plasticizers per ASTM C 260-95 & C 494-92.
- 4) Reinforcing per ASTM A186. Min. 1-1/2" cover.
- 5) Joints sealed with butyl rope mastic.
- 6) 4" wall, base, & top thickness.

<p>Maver Bros. Inc.</p>	<p>0260-0000-0000 P.O. Box 1000 12-410-790-7434 Fax: 370-790-1430</p>	<p>1,500 GALLON SEPTIC/PUMP TANK 1-Compartment</p>
	<p>NON-TRAFFIC MAX 5 IL OF COVER</p>	<p>Dwg. No. 1500-TC No Scale Jan 1, 2000</p>

INNOVA, LTD  
INNOVATIVE WASTEWATER TREATMENT SYSTEMS  
P.O. BOX 363, NEW WINDSOR, MD 21776  
(410) 875-9370 Office  
(410) 635-2883 Fax  
H. Dale Gray, Principal

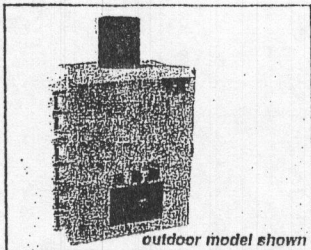
2081/01



112IW104H + OPTIONS 8A, 8C, 10E

## MODEL 112 control panels

Single-phase, simplex motor contactor control.



outdoor model shown

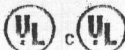
### FEATURES

- Entire control system (panel and switches) is UL Labeled to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Package includes float switches (optional)
- Complete, step-by-step installation instructions included
- Two-year limited warranty

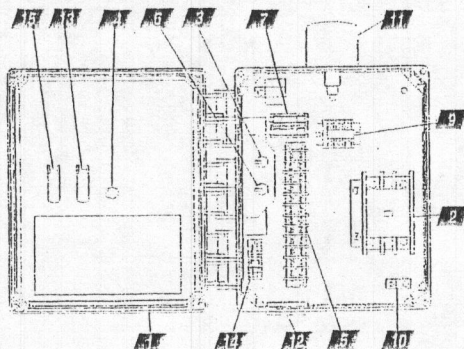
1. Enclosure measures 10 x 8 x 4 inches (25.4 X 20.32 X 10.16 cm) with removable mounting flanges. Choice of NEMA 1 (engineered thermoplastic for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic for outdoor use).
2. Magnetic Motor Contactor controls pump by switching both electrical lines
3. HOA Switch for manual pump control
4. Green Pump Run Indicator Light
5. Float Switch Terminal Block
6. Control ON/OFF Switch
7. Control and Alarm Fuses
8. Circuit Breaker (optional) provides pump disconnect (not shown)
9. Input Power Terminal Block
10. Ground Lug

### APPLICATIONS

The Model 112 control panel provides residential and commercial customers with a reliable means of controlling one 120, 208, or 230 VAC single-phase pump in water and sewage installations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system. Common applications include pump chambers, sump pump basins, irrigation systems, and lift stations.



Model Shown 112IW114X



### ALARM PACKAGE (OPTIONAL)

- Red Alarm Beacon** provides 360° visual check of alarm condition
- Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating)
- Exterior Horn Silence Switch** allows alarm horn to be silenced
- Horn Silence Relay** automatically resets alarm after alarm condition has been resolved
- Exterior Alarm Test Switch** allows for testing of horn and light to

**rhombus**  
TECHNOLOGY

## TYPE 112 INSTALLATION INSTRUCTIONS

Single Phase Simplex Control Panel

### CAUTION:

Rhombus cannot be responsible for damages caused by the faulty or negligent installation of this control. We recommend that you engage the services of a competent plumber, electrician or qualified service person to install this product in accordance with the national and local electrical codes.

All conduit running from the sump or tank to the control panel must be sealed with conduit sealant to prevent moisture or gases from entering the panel. Nema 1 enclosures are for indoor use primarily to provide a degree of protection against contact with enclosed equipment. Cable connectors are not required to be liquid tight in Nema 1 enclosures. Do not use Nema 1 enclosures if subjected to rain, splashing water, or hose directed water. Nema 4X enclosures are for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose directed water. Cable connectors must be liquid tight in Nema 4X enclosures.

### MOUNTING AND WIRING CONTROL PANEL

1. Determine mounting locations for control panels. If distance exceeds the length of either the float switch cables or the pump power cables, splicing will be required. For outdoor or wet installation we recommend the use of a junction box with liquid tight connectors (S.J. Electro System's Model JB70) to make required connections. (When using conduit refer to enclosed conduit connector sheet, and be sure to use conduit sealant to prevent moisture or gases from entering the panel.)

2. On the control panel, determine the "power in" location (from the building power supply). Check local codes and schematic for power circuit requirements.

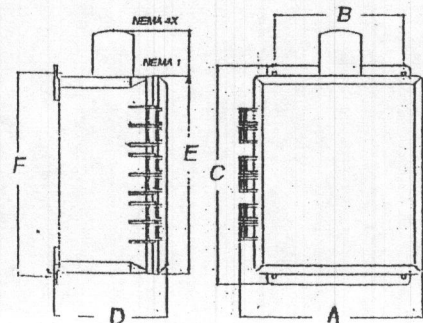
**CAUTION: BE SURE THE POWER SUPPLY VOLTAGE AND PHASE ARE THE SAME AS THE PUMP MOTORS BEING INSTALLED. IF IN DOUBT, SEE THE PUMP IDENTIFICATION PLATE FOR VOLTAGE/PHASE REQUIREMENTS.**

3. On the control panel, determine the location of the pump power cables, and the float switch cables.

4. Drill proper size holes for connection to panel.

**CAUTION: IF USING CONDUIT, BE SURE THAT THE CONDUIT BEING USED IS OF ADEQUATE SIZE TO PULL THE PUMP AND SWITCH CABLES THROUGH. RECOMMENDED MINIMUM 1/4" FOR SIMPLEX APPLICATIONS.**

5. Mount control panel (mounting devices are furnished with control panel)
  - a. NEMA 4X mounting flange kit included in the box.
  - b. NEMA 1 mounting feet are installed on enclosure, rotate feet to desired position.
6. Attach cable connectors and/or conduit connectors to control panel.



FOR INSTALLATION WITHOUT A SPICE GO TO STEP 12. FOR INSTALLATIONS REQUIRING A SPICE FOLLOW STEP 7 - 11.

**CAUTION: AT THIS POINT, TURN OFF ALL POWER SOURCES.**

7. Determine location for mounting junction box according to local code requirements. Do not mount the Junction Box inside the sump or basin.

8. Run the conduit or connectors to junction box and drill the junction box as required to make the proper connections. Attach the conduit or connections to the junction box.

9. Mount junction box to proper support

10. Pull pump power cables and float switch cables through connectors into junction box. Identify and label each wire before pulling through conduit into control panel. Make necessary wire splice connections at junction box.

11. Firmly tighten all fittings on junction box.

12. If a junction box is not required, pull pump cables and float switch cables through connectors/conduit into control panel.

13. Attach pump cables and float switch cables to the proper numbered terminals. SEE WIRING DIAGRAM INSIDE CONTROL PANEL.

**CAUTION: IF FLOAT SWITCH CABLES ARE NOT WIRED IN THE PROPER ORDER, THE PUMP SYSTEM WILL NOT FUNCTION PROPERLY.**

14. Connect "power in" conductors to proper terminals. (SEE WIRING DIAGRAM)

	NEMA 1	NEMA 4X
A	9 1/8"	9 1/8"
B	6 1/4"	6"
C	12 1/4"	11 1/4"
D	7 1/4"	7 1/4"
E	10 1/2"	13 1/2"
F	11 3/4"	10 3/4"

**SIE**  
**Rhombus**

**CONTROL PANELS**

**MODEL 112**

**ALARM PACKAGE**

0 = select options or no alarm package

1 = alarm package (includes test/normal/silence switch, fuse, red light, horn & float)

**ENCLOSURE RATING**

1 = Indoor, NEMA 1 (metal)

W = Weatherproof, NEMA 4X (engineered thermoplastic)

**STARTING DEVICE**

1 = magnetic motor contactor 120/208/240V

9 = magnetic motor contactor 120V only

**PUMP FULL LOAD AMPS**

0 = 0-7 FLA

1 = 7-15 FLA

2 = 15-20 FLA

3 = 20-30 FLA

**PUMP DISCONNECTS**

0 = no pump disconnect

1 = pull-out with safety deadfront in a 10"x8" enclosure

4 = circuit breaker 120V (select STARTING DEVICE option 9 above)

120/208/240V (select STARTING DEVICE option 1 above)

**FLOAT SWITCH APPLICATION**

H or L = pump down or pump up

X = no floats

WITH alarm package

WITHOUT alarm package

**OPTIONS** Listed below

★ **ENCLOSURE UPSIZE** - If you selected 3 or more of the ★ options, or one ★★ option, a one-time enclosure upsize fee would apply.

**Additional features are required for the factory to quote on an Engineered Custom control panel.**

CODE	DESCRIPTION	CODE	DESCRIPTION
1A	Red Beacon only / no audio (must select 1E if floats included)	11C	NEMA 1 alarm panel must select option 6A
1C	Horn only / no visual (must select 1E if floats included)	11D	NEMA 4X alarm panel must select option 6A
1E	Alarm float	★11B	Main disconnect (rotary style, mounted through door non-fused)
3A	Alarm flasher	★★	0-20 FLA (total of both pumps)
★3B	Manual alarm reset	★★	20-30 FLA (total of both pumps)
★4A	Low level cutoff (select option 4D if floats included)	15A	Control / alarm circuit breaker
★4B	Red low-level indicator & alarm (must select 4A also)	16A	10' cord in lieu of 20' (per float)
4D	Low-level float	16B	15' cord in lieu of 20' (per float)
★5A	Thermal cutoff/thermal sensor auto reset (for pumps with thermal switch leads)	16C	30' cord in lieu of 20' (per float)
★5E	Sent failure circuit & red indicator (2 wire)	16D	40' cord in lieu of 20' (per float)
6A	Auxiliary alarm contact, form C type	17A	SJE SignalMaster® / mounting strap (per float)
★8A	Elapsed time meter	17B	SJE SignalMaster® / externally weighted (per float)
★8C	Event (cycle) counter	17C	Sensor Float® / internally weighted (per float)
★9A	Pump overload specify amperage after number 9 followed by letter "A". Example: 912A = 12 amp pump.	17D	Sensor Float® / externally weighted (per float)
★★	0-25 FLA	17E	Sensor Float® Mini / pipe clamp (per float)
★★	25-30 FLA	17F	Sensor Float® Mini / externally weighted (per float)
10E	Lockable latch - NEMA 4X	19T	TOA (Test/On/Off/Automatic) switch and pump run light through door mounted
10F	Lockable latch - NEMA 1	19U	HOA (Hand/Off/Automatic) switch and pump run light through door mounted
★10F	Lightning arrester	19X	Door mounted pump run indicator
★10K	Anti condensation heater	21A	SJE PumpMaster® in lieu of on/off switches
		21B	SJE PumpMaster® Plus in lieu of on/off switches
		21C	Super Single® in lieu of on/off switches
		21D	Double Float® in lieu of on/off switches

● Mechanically-activated ▲ Mercury-activated

**SAMPLE**

MODEL 112 1 W 9 1 4 H 3A 8A

Alarm Package —

Enclosure Rating —

Starting Device —

Pump Full Load Amps —

Pump Disconnect —

Float Switch Application —

Options: Flasher, Elapsed Time Motor —

©SJE/Rhombus Printed in USA 03/06

Project J. LEWIS PROPERTY  
1711 UNDERWOOD ROAD  
SYKESVILLE, MD (HOWARD COUNTY) 21784

Sheet Title:  
WASTEWATER  
SYSTEM  
PLAN

DRAWING

11 WWT-1  
9 of 11 sheets

10/8/07

1" = NA

**INNOVA, LTD**  
INNOVATIVE WASTEWATER TREATMENT SYSTEMS  
P.O. BOX 363, NEW WINDSOR, MD 21776  
(410) 875-9370 Office

**INNOVA, LTD**  
INNOVATIVE WASTEWATER TREATMENT SYSTEMS  
P.O. BOX 363, NEW WINDSOR, MD 21776  
(410) 635-2883 Fax  
H. Dale Gray, Principal



10/18/07

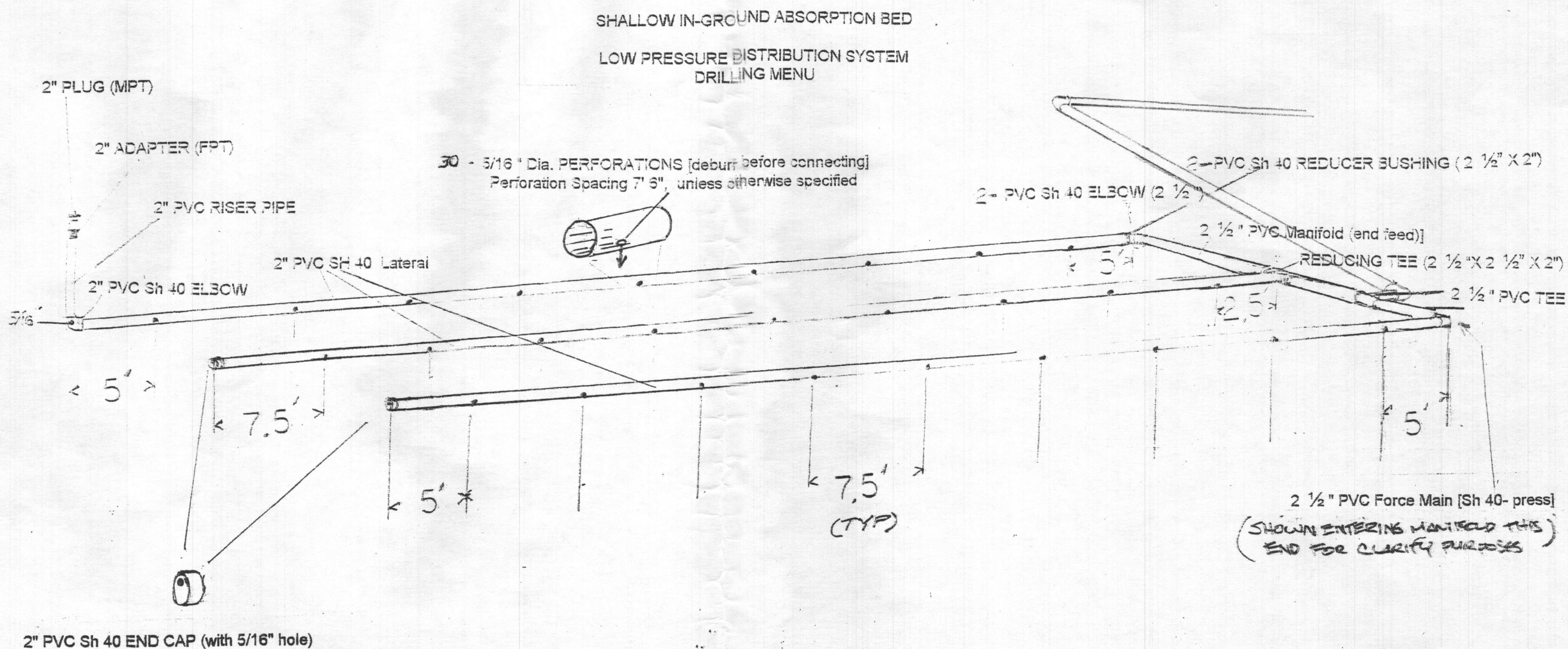
AS  
= SHOWN

(410) 875-9370 Office



INNOVATIVE WASTEWATER TREATMENT SYSTEMS  
P.O. BOX 363, NEW WINDSOR, MD 21776

(410) 635-2883 Fax



Project J. LEWIS PROPERTY  
1711 UNDERWOOD RD.  
STYREVILLE, MD (HOWARD COUNTY) 2  
Sheet Title:  
WASTEWATER  
SYSTEM  
PLAN  
DRAWING  
# WWT-1  
10 of 11 Sheet



# CONSTRUCTION PROCEDURES\*

[Modified for Shallow In-Ground Bed Structure]

## 5.1. GENERAL

Proper construction is extremely important if the sand mound is to function as designed. Installation of a sand mound system is prohibited when soils are frozen. Construction of the <sup>SHALLOW IN-GROUND BED</sup> mound should not occur if the soil is too wet. Compaction and puddling of the soil in the location of the mound and downslope should be avoided. Soil is too wet for construction of the <sup>BED</sup> mound if a sample, taken anywhere within the upper eight inches, when rolled between the hands forms a wire. If the sample crumbles, the soil is dry enough for construction to proceed.

## 5.2. EQUIPMENT

The following special equipment is recommended:

1. A small track-type tractor with blade for placing and spreading the <sup>GRAVEL</sup> sand-fill.
2. A cordless drill for drilling holes in the pipe on-site.
3. A moldboard or chisel plow for plowing the soil within the perimeter of the <sup>BED</sup> mound. A rototiller may be used on structureless soils with USDA sand textures.
4. A rod and level for determining bed elevations, slope on pipes, outlet elevation of septic tank, slope of site, etc.

## 5.3. MATERIALS

The following specifications are required:

- NA(1)
1. Sand fill material must be approved by the local Approving Authority prior to hauling to the site. Submit a sample to the local Authority for analyses at least three weeks in advance of construction or select a sand fill from the list of potential sand suppliers. If a sample is submitted for analyses a fee will be charged. Sand fill shall have an effective size between 0.25 mm and 0.5 mm with a uniformity coefficient of 3.5 or less. A copy of the receipt from the sand supplier showing the company name, address, phone number, date and product name will be required.
  2. Aggregate shall be clean aggregate free of fines and between 3/4 to 2 inches in diameter.
  3. Geotextile fabric shall be of a type approved by the Approving Authority.
  4. Cap material shall be soil relatively free of coarse fragments and preferably a clay loam or silt loam texture.

41

material into place using a small track-type tractor with a blade. Work from the end and upslope side. Always keep a minimum of six inches of material beneath the tracks of the tractor to minimize compaction of the natural soil. The <sup>BED</sup> fill material should be worked in this manner until the height of the fill reaches the elevation of the top of the absorption bed.

- NA(5.5.4)
- 5.5.3 With the blade of the tractor, form the absorption bed. Hand level the bottom of the bed and check it for proper elevation. The bed should be level for proper functioning of the mound. Call for inspection.
  - 5.5.4 Shape the sides of the sand fill to design slope (i.e., 3:1 or flatter).

## 5.6. BED AND DISTRIBUTION NETWORK

- 5.6.1 Carefully place the coarse aggregate in the bed. Do not create ruts in the bottom of the bed. Level the aggregate to a minimum depth of six inches.
- 5.6.2 The distribution network is assembled in place setting the manifold to ensure draining the laterals between doses. The laterals should be laid level with the holes directed downward. Call for inspection. Test the pumping chamber and distribution network with clean water.
- 5.6.3 Place additional aggregate to a depth of at least two inches over the crown of the pipe.
- 5.6.4 Place the approved geotextile fabric over the aggregate bed. The fabric may extend beyond the bed <sup>OVER NATIVE SOIL (UNDISTURBED)</sup> over the sand fill.

## 5.7. COVER MATERIAL

- 5.7.1 Place a finer textured soil material such as sandy clay loam, clay loam, or silt loam on top of the fabric over the bed. The minimum depth of this cap shall be six inches at the outer edges of the bed and 12 inches along the center.
- 5.7.2 Place a minimum of six inches of good quality topsoil over the entire mound surface including the sideslopes. Call for final inspection.

## 5.8. VEGETATION

- 5.8.1 Fertilize, lime, seed and mulch the entire surface of the mound. Grass mixtures adapted to the area should be used.
- 5.8.2 Consult the county extension agent or Soil Conservation Service for recommendations.

43

## 5.4. TANK INSTALLATION AND SITE PREPARATION

- 5.4.1 Locate and rope-off the entire sewage disposal area to prevent damage to the area during other construction activity on the site. Vehicular traffic over the disposal area should be prohibited to avoid soil compaction.
- 5.4.2 Install septic tank(s) and pumping chamber(s) and pump as shown on the drawings. Call for inspection.
- 5.4.3 Stake out the initial and recovery mound perimeters in their proper orientation as shown in the drawings. Reference stakes offset from the mound corner stakes are recommended. Locate the upslope edge of the absorption bed within the mound and determine the ground elevation at the highest location. Reference this elevation to a benchmark for future use. This is necessary to determine the bottom elevation of the absorption bed.
- 5.4.4 Excess vegetation should be cut and removed. Trees should be cut at ground level and stumps left in place.
- 5.4.5 Determine the location where the force main from the pumping chamber will connect to the distribution network manifold within the <sup>BED (PIPE SUPPORT)</sup> mound.
- 5.4.6 Install the force main from the pumping chamber to the proper location within the mound. Pipe should be laid with uniform slope back to the chamber so that it drains after dosing. Cut and stub off pipe one foot below existing grade within the proposed perimeter of the initial mound. Backfill trench and compact to prevent seepage along the trench.
- 5.4.7 Plow the soil within the perimeter of the <sup>BED</sup> mound to a depth of about <sup>FOUR</sup> eight inches, if the soil is not too wet. Moldboard or chisel plows may be used. Plowing should be done along the contour, throwing soil upslope. Use a two bottom or larger Moldboard plow. In wooded areas with stumps, roughening the surface to a depth of four to six inches with backhoe teeth may be satisfactory. However, all work should be done from the upslope or sides of the <sup>BED</sup> mound if at all possible. Rototilling may be used on soils with USDA textures of sand. After plowing, all foot and vehicular traffic shall be kept off the plowed area.

## 5.5. FILL PLACEMENT

- M(5.5.1)
- 5.5.1 Relocate and extend the force main several feet above the ground surface.
  - 5.5.2 Place the approved <sup>BED GRAVEL</sup> sand-fill material on the upslope edge(s) of the plowed area. Keep <sup>GRAVEL</sup> delivery trucks off the plowed area. Minimize traffic on the downslope side. Fill should be placed and spread immediately after plowing. Move the fill

42

Project	J. LEWIS PROPERTY 1711 UNDERWOOD ROAD SYKESVILLE, MD (HOWARD COUNTY) 21784
Sheet Title:	WASTEWATER SYSTEM PLAN
DRAWING	
#	WWT-1
of	1 Sheets



INNOVA, LTD  
INNOVATIVE WASTEWATER TREATMENT SYSTEMS

P.O. BOX 363, NEW WINDSOR, MD 21776

(410) 875-9370 Office

(410) 635-2883 Fax  
H. Dale Gray, Principal

# MOUND TEST DATA SHEETS

Property I.D. 1711 Underwood Rd, Lot # Date 6/25/07

Sanitarian B. Baker Landscape Position Wooded

% Slope Slight Soil Type \_\_\_\_\_ Contractor Fogles

HOLE # E DEPTH OF TEST 18" START TIME 11:25

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
8"	0	0	0	
7 5/16"	10	11/16"	15	mpi
6 11/16"	15	10/16"	24	mpi
6 9/32"	10	13/32"	25	mpi
5 31/32"	10	5/16"	32	mpi
4 29/32"	35	1 1/16"	33	mpi
4 7/16"	15	15/32"	32	mpi
4 2/16"	15	5/16"	48	mpi
3 9/16"	25	9/16"	44	mpi
2 11/16"	45	14/16"	51	mpi

27/16" 12 4/16" 48 mpi → Ended at 2:37

HOLE # \_\_\_\_\_ DEPTH OF TEST \_\_\_\_\_ START TIME \_\_\_\_\_

[illegible]



Mr Barry Glotfelty, R.S.  
Maryland Dept. Of the Environment  
1800, Washington Blvd.  
Balt. MD 21230

Onsite Systems Division  
Wastewater Permits Program

Re. Lewis Property, 1711 Underwood Road, Sykesville, MD 21784  
(Howard County)

Mr. Glotfelty:

Please find attached the response to your comments regarding the design submitted for the Lewis property onsite wastewater system.

1. Allow force Main to drain into manifold and laterals. Eliminate 1/4" hole in force main this allows one section to drain to pump pit and one section to the bed. **Agreed** - drain hole was intended to eliminate possibility of freeze, and the depth to provide added protective burial for piping. Pipe raised, drain hole removed see pg #2
2. It is probably simpler design for contractor to understand if all holes are spaced 7.5' apart with first and last holes being 3.75' from bed ends. Current configuration is O.K. but clearly indicate that manifold is 2.5' from end of bed. **Agreed**. Staggering of holes is intended to improve distribution, but may be moot. Also manifold location is spec'd on Page #5, item E.
3. What are the existing grade elevations at corners of the bed? This info is needed to determine depth of bed below existing land surface to assure treatment zone maintained, and to determine fill cap requirements at different locations over the bed. **agreed** - bed has been curved to bring corners into better grade alignment, and repositioned bed slightly to avoid a sizeable tree between bed center and driveway - have marked bed area with yellow flags. See pg #2.
4. Revise to show selected pretreatment unit. **Agreed**, using MDE, grant specified Hoot Aerobic Systems H-600 A (gravity feed). The Tank manufacturer did not have a cut sheet available at this time, but it would be a minimum 1320 gal. tank per drawing pg. #6.
5. Indicate pump chamber riser to extend 6" above finished grade. **Agreed** see pg #2
6. Per Method min. dose is 216 gal. - Agree on method -  
[F/M = 43.75 gal. + 5Xlaterals = 182.7] : dose = 226 gal. **Delivered**  
29.4 gal. (118' F/M drain back)  
255.4 gal. Pumped
7. Include turn up on each lateral. **Agreed** (see pg 5)
8. Revise float settings to reflect revised dose. (See pg 8)

October 26, 2007



OK with one  
change - Add 1/4"  
weep hole in elbow of  
discharge pipe in  
pump  
chamber.

And Mike may want pit

2 is  
Abandoned.  
BG - 11-7