

PUB. SEWER STATUS VERIFIED BY _____

ISSUE DATE: _____

PERMIT

P 22296

APPROVAL DATE: _____

INDEXED

A 518053

ON-SITE SEWAGE DISPOSAL SYSTEM HOWARD COUNTY HEALTH DEPARTMENT BUREAU OF ENVIRONMENTAL HEALTH

05-360293

IS PERMITTED TO INSTALL ALTER

ADDRESS: _____ PHONE NUMBER: _____

SUBDIVISION: Country Lane LOT NUMBER: 11

ADDRESS: 7491 Mink Hollow Road PROPERTY OWNER: Edward Trivelli

SEPTIC TANK CAPACITY (GALLONS): 1500

PUMP CHAMBER CAPACITY (GALLONS): _____

NUMBER OF BEDROOMS: 5

SQUARE FEET PER BEDROOM: _____

LINEAR FEET OF TRENCH REQUIRED: _____

TRENCHES:	Trench to be _____ feet wide. Inlet _____ feet below original grade. Bottom maximum depth _____ feet below original grade. Effective area begins at _____ feet below original grade. _____ feet of stone below distribution pipe.
LOCATION:	_____
PURPOSE:	_____

PLANS APPROVED: _____ DATE: _____

- NOTE: PERMIT VOID AFTER 2 YEARS
- NOTE: CONTRACTOR RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION INSPECTION FOR ALL INSTALLATIONS
- NOTE: WATERTIGHT SEPTIC TANKS REQUIRED
- NOTE: ALL PARTS OF SEPTIC SYSTEM SHALL BE 100 FEET FROM ANY WATER WELL
- NOTE: MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS

NEITHER THE HOWARD COUNTY COUNCIL NOR THE HEALTH DEPARTMENT IS RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT CALL 410-313-2640 FOR INSPECTION OF SEPTIC SYSTEM

A518053



MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Shari T. Wilson
Secretary

Anthony G. Brown
Lieutenant Governor

Robert M. Summers, Ph.D.
Deputy Secretary

December 19, 2007

William Tucker
7491 Mink Hollow Road
Highland, MD 20771

RE: Tax Map 40, Grid 07, Parcel 388

Dear Mr. Tucker:

Thank you for completing a pre-application for the Bay Restoration Fund (BRF) Onsite Sewage Disposal System (OSDS) Program. The pre-application submitted is for your property located at 7491 Mink Hollow Road, Highland, and shown on Tax Map 40, Parcel 07. A review of the pre-application indicates a high priority for funding. This letter is to notify you of preliminary approval for funding from the BRF for the installation of best available technology (BAT) for removing nitrogen as part of your on-site sewage disposal system.

This notification letter is intended to assist you through the process of obtaining proper BAT installation bids and invoicing procedures to obtain funding from the BRF. Please read this document carefully and follow instructions accordingly. The following sections outline the requirements necessary for proceeding with the project.

Submission of Bids

Three bids must be submitted to MDE for review. If you are unable to obtain three bids you must submit to MDE a written record of your attempts to obtain a minimum of three bids. Bids must include the following:

- Notice that the installation will not be considered complete until the manufacturer or manufacturer's designee provides notice that the job has been satisfactorily completed. A manufacturer certified contractor might also serve as the manufacturer designee. The installer, whether they are a manufacturer representative or one chosen by the property owner, must submit an installation quote with each bid or the bid will be considered incomplete.
- An agreement for a minimum of five years operation and maintenance by a manufacturer approved service provider.
- Manufacturers must have an approved sampling protocol on file at MDE.
- Bids must be itemized. The bid is to include the cost of the unit and the installation cost of the unit. Only the components and labor (including electrical connections) directly related to upgrading an onsite sewage disposal system to the best available technology for removing nitrogen are eligible for funding.

Mr. William Tucker
Page Two

- Manufacturers should respond to your request for bids within 14 days. After 14 days from your request for bids, you may submit to MDE the bids received and a list consisting of the manufacturers and manufacturers contact that did not respond to your request for a bid.
- The maximum number of BAT system installs an installer may be bid on is two. After 14 days from your request for installation bids, you may submit to MDE the bids received and a list consisting of the installers contacted that did not respond to your request for bid. At your request, MDE can provide you a list of installers that have participated in the program.

The following manufacturers have undergone MDE review and are eligible for BRF grants:

Aquapoint, Inc. (Bioclere™ Model) www.aquapoint.com

Contact: Robbie Tippet (240) 298-7572 rtipp4@aol.com
Sam Seymour (585) 473-3300 sseymour@aquapoint.com

Bio-Concepts, Inc. (ReCip® RTS) www.bioconceptsinc.com

Contact: Al Privette (252) 229-7040 alprivette@coastal.net

Bio-Microbics, Inc. (MicroFAST® & RetroFAST®) www.biomicrobics.com

Contact: Freemire & Associates (410) 768-8500 www.freemire.com

F.R. Mahony & Associates, Inc. (Amphidrome™ Model) www.frmahony.com

Contact: David Kershner (610) 351-0963 d.kershner@ketllc.com

Hoot Aerobic Systems, Inc. (H-Series Hoot and Hoot BNR) www.hootsystems.com

Contact: Nancy Mayer (410) 796-1434 mayerbro@connext.net

Lombardo Associates, Inc (Nitrex Systems) www.lombardoassociates.com

Contact: Pio Lombardo (617) 964-2924 pio@lombardoassociates.com

Norweco, Inc. (Singular Model TNT System) www.norweco.com

Contact: Eastern Shore, Randy Clark (800) 773-9128 ranjodan@yahoo.com
Western Shore, Jeff Earnshaw (301) 274-3772

SeptiTech, Inc. (SeptiTech® Model) www.septitech.com

Contact: Bruce Melton (410) 878-2952 rbmelton@progressiveseptic.com
Western MD, Scott Everhart (304) 676-3823 www.cseenterprises.net

Waterloo BioFilter Systems, Inc. (Waterloo Biofilter Model) www.waterloo-biofilter.com

Contact: Waterloo, Ontario, Canada (519) 856-0757

Mr. William Tucker
Page Three

Conditions of Financial Assistance

By reading and signing this form, you agree to the limitations and conditions set forth in this document. This form must be returned with your submission of bids. Your bid submission will be considered incomplete if this form does not accompany it.

Award of Grant

- MDE will review the bids. The grant award will be obligated based on the lowest acceptable bid, however the applicant may select a higher acceptable bid.
- The applicant will be notified by MDE as to the amount of the grant obligation.
- For awards greater than \$25,000 MDE must present a proposal to the Board Public Works for approval.
- No change orders will be accepted by MDE.
- The award amount is available for reimbursement within 6 months of Department signature on the Agreement and Easement document. Upon request of the applicant, the original 6-month period may be extended at the discretion of the Department.

Agreement and Easement

An Agreement and Easement must be completed, signed by all parties and recorded in the Land Records of Howard County Maryland. A draft copy of the Agreement and Easement is provided to you in this letter for your review. A completed Agreement will be provided to you after bids are submitted to MDE when you are notified of the grant approval amount. The purpose of this Agreement is to accomplish the following:

- To establish your voluntary participation in this program.
- To ensure that a minimum of five years operation and maintenance is performed by an approved provider (included in the upfront cost of the system).
- Allows access for State, County and the Manufacturer designee's to inspect and collect samples from the system.
- Establishes the amount of the grant award.

Local Permitting Requirements

- All required local permits must be obtained.
- Permit fees are not eligible for BRF funding.
- Contact Howard County Health Department for more information.

Submission of Invoice

- Upon completion of the job, owner submits an invoice to MDE.
- The invoice must include the following;
 - Notice that the job was completed to the satisfaction of the owner.

Mr. William Tucker
Page Four

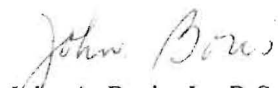
- Notice that the job was completed to the satisfaction of the manufacturer or manufacturer's designee.
- Contractor's invoice.
- An "as-built" sketch of the installation site done by the Howard County Health Department.

Issuance of Funds From the BRF

After review of the submitted invoice and associated documents, the Office of the Comptroller of the State of Maryland will issue a check to the property owner.

Once again the Department thanks you for participating in this important program. If you have any questions, please feel free to contact me at 410-537-3678 or 800-633-6101 ext 3678 or email at jboris@mde.state.md.us.

Sincerely,



John A. Boris, Jr., R.S.
Bay Restoration Fund Project Manager

Enclosure

cc: Jay Prager
Howard County Health Department ✓
Mr. Edward Trivelli

2007 DE 25 PH10: 14

HOWARD COUNTY HEALTH DEPT.
BUREAU OF ENVIRONMENTAL HEALTH

DEC 29 2007

RECEIVED

DECLARATION OF EASEMENT AND RIGHT OF WAY
(Septic System)

THIS DECLARATION OF EASEMENT AND RIGHT OF WAY, made this 16th day of September, 2007 by William E. Tucker and Dayna K. Tucker ("Grantors") and Edward Trivelli and Katherine Trivelli ("Grantees").

WHEREAS, the Grantors are the owners, in fee simple, of certain land and premises situate in the County of Howard, State of Maryland, described in Exhibit "A" hereto; and

WHEREAS, the Grantees are the owners, in fee simple, of certain land and premises situated in the County of Howard, State of Maryland, described in Exhibit "B" hereto; and

WHEREAS, the parties desire by these presents to establish a certain easement and right-of-way for a septic system and sanitary sewer (more fully described below) in, through, to and over the land described in Exhibit "A" and for the benefit of certain of the land and premises described in Exhibit "B" hereto and further desire to make certain other agreements.

NOW, THEREFORE, in consideration of Ten Dollars (\$10.00) paid by Grantees to Grantors and of the undertakings hereinafter set forth, the Grantors hereby declare that the real property shown on Exhibit "A" hereto is and shall be held, conveyed, hypothecated or encumbered, sold, leased, rented, used, occupied and improved subject to the provisions of this Declaration, each and every of which shall be deemed to run with and bind the land and each and every of which shall inure to the benefit of and be enforceable by the Grantees and by their successors and assigns in and to the land described in Exhibit "B" hereto.

1. The Grantors do hereby grant and establish an easement and right-of-way for the installation, construction, maintenance, repair, operation and inspection of a septic system and sanitary sewer, including all necessary septic and sanitary sewer structures and appurtenances in, through, to and over the land described in Exhibits "C-1," "C-2," "C-3" and depicted on Exhibit "D" (the "Easement Areas") for the benefit of the real property owned by the Grantees as described in Exhibit "B", and no person shall in any way interfere with the free and unobstructed use thereof by all persons entitled to the benefit of the same.

WET
2. **UPON INSTALLATION OF SEPTIC SYSTEM*
* Grantor shall not erect nor permit to be erected any building or structure of any nature whatsoever nor any tree, shrub or other planting that would interfere with the septic and sanitary sewer system within the Easement Areas, nor fill or excavate within the said Easement Areas without the consent of Grantee.

UPON INSTALLATION OF SYSTEM

3. Grantee shall have, at all times, the right of ingress and egress over the Easement Areas described in Exhibits "C-1," "C-2" and "C-3" and from the existing macadam driveway, as depicted on Exhibit "D," to the easement and right-of-way areas.

* with reasonable prior notice


4. Any damage to Grantors real property, including the driveway, caused by Grantees while performing work permitted by this Declaration will be repaired by the Grantees promptly in a workmanlike manner.

5. To the extent not inconsistent with the provisions of this Declaration, the general rules of law regarding easements and of liability for property damage due to negligent or willful acts or omissions regarding the same shall apply hereto.


6. Any and all rights, reservations, easements, rights-of-way and interests created pursuant to this Declaration shall be binding upon the parties hereto and the successors and assigns of the parties in the land and premises described in Exhibits "A" and "B", and shall be deemed to run with and bind the land and shall exist in perpetuity.

8. Nothing herein contained shall be construed as a dedication to public use.


IN WITNESS WHEREOF, the parties have signed this Declaration as of the year and day first above written.



William E. Tucker



Dayna K. Tucker



Edward Trivelli

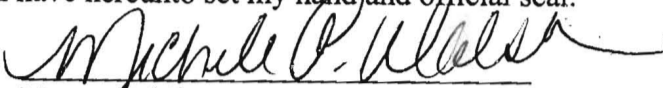


Katherine Trivelli

STATE OF MARYLAND :
: SS
COUNTY OF :

I HEREBY CERTIFY that on this 16th day of September, 2007, before me, the subscriber, a Notary Public in and for the State and County aforesaid, personally appeared William E. Tucker and Dayna K. Tucker, known to me (or satisfactorily proven) to be the persons whose names are subscribed to the within instrument and acknowledged that they have executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.


Notary Public

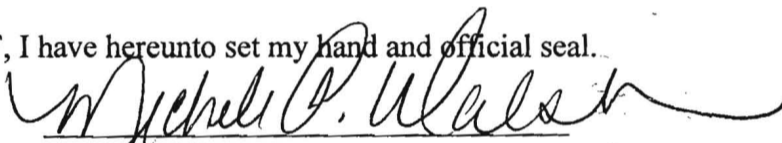
My commission expires:

MICHELE P. WALSH
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires October 1, 2008

STATE OF MARYLAND :
: SS
COUNTY OF :

I HEREBY CERTIFY that on this 16th day of September, 2007, before me, the subscriber, a Notary Public in and for the State and County aforesaid, personally appeared Edward Trivelli and Katherine Trivelli, known to me (or satisfactorily proven) to be the persons whose names are subscribed to the within instrument and acknowledged that they have executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.


Notary Public

My commission expires:

MICHELE P. WALSH
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires October 1, 2008

ATTORNEY CERTIFICATION

I certify that this instrument was prepared under the supervision of an attorney admitted to practice before the Court of Appeals of Maryland.

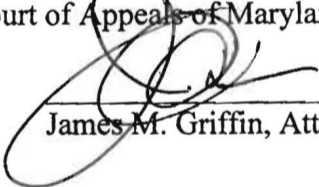

James M. Griffin, Attorney

EXHIBIT "A"

BEGINNING FOR THE SAME at the end of 1445.00 feet on the 8th line of a conveyance to Edwin G. Wilson for 72.307 acres of land and recorded among the Land Records of Howard County, Maryland, in Liber No. 600, folio 118, thence with part of said line North 83 degrees 30' 57" West 371.91 feet to the end of said line thence to include a part of said land North 83 degrees 30' 57" West 200.00 feet thence North 01 degrees 30' 29" West 428.48 feet thence North 61 degrees 37' 10" West 438.23 feet to a point in Mink Hollow Road thence along said road North 27 degrees 58' East 10.00 feet, thence leaving said road South 61 degrees 37' 10" East 438.30 feet, thence on a curve to the left having a radius of 583.41 feet for a distance of 331.67 feet, thence North 85 degrees 48' 27" East 158.00 feet, thence South 12 degrees 20' 01" East 455.21 feet to the place of beginning, containing 5.061 acres of land.

EXHIBIT "B"

BEGINNING FOR THE SAME at an iron pipe placed at the beginning of 9th line of a conveyance from Institute for Behavioral Research, Inc. to Edwin G. Willson, et al., for 72.307 acres of land and recorded among the Land Records of Howard County, Maryland, in Liber No. 600, folio 118, thence with the lines of said conveyance and to include a part of said land.

- (1) South 06° 28' West 345.03 feet to a point in Patuxent River, thence along said river,
- (2) South 80° 58' West 266.23 feet, thence
- (3) North 89° 05' West 190.69 feet, thence
- (4) North 63° 11' West 266.50 feet, thence
- (5) North 28° 39' West 373.06 feet to a point on the bridge over the Patuxent River at Mink Hollow Road, thence along said road, thence
- (6) North 27° 26' East 128.99 feet to the beginning of the fifteenth line of said conveyance, thence with part of said line
- (7) North 27° 58' East 542.00 feet, thence leaving said Mink Hollow Road, thence
- (8) South 61° 37' 10" East 438.23 feet to an iron pipe, thence
- (9) South 01° 30' 29" East 428.48 feet to an iron pipe, thence
- (10) South 83° 30' 57" East 200.00 feet to the place of beginning, containing 13.826 acres of land

**LEGAL DESCRIPTION OF
CENTERLINE OF A 20 FOOT WIDE SANITARY SEWER EASEMENT
THROUGH PARCEL 388 FOR THE BENEFIT OF PARCEL 227
TAX MAP 40, GRID 7, HOWARD COUNTY, MARYLAND**

BEING a 20 foot wide strip of land situated on that property which was granted and conveyed to William E. Tucker and Dayna K. Tucker by deed dated April 25, 2007 and recorded among the Land Records of Howard County, Maryland in deed book 10708 at folio 270, said Tucker property is also known as Parcel 388 at Tax Map 40, Grid 7, the centerline of said 20 wide strip of land is more particularly described as follows;

BEGINNING at a point on the westerly or the North 09 degrees 08 minutes 41 seconds West, 428.48 foot property line of said Parcel 388, said line is also the easterly property line of that property which was granted and conveyed to Edward Trivelli and Katherine Trivelli by deed dated April 25, 2007 and recorded among the same Land Records in deed book 10708 at folio 296, said Trivelli property is also known as Parcel 227 at Tax Map 40, Grid 7, said point of beginning is situated 126.01 feet from the northern end of said property line, thence leaving said property line and running through, over and across said Parcel 388 for the following seven (7) courses and distances;

1. South 59 degrees 41 minutes 13 seconds East, 34.07 feet to a point, thence
2. South 82 degrees 00 minutes 56 seconds East, 31.04 feet to a point, thence
3. North 85 degrees 32 minutes 51 seconds East, 41.64 feet to a point, thence
4. South 83 degrees 53 minutes 13 seconds East, 15.18 feet to a point, thence
5. South 68 degrees 31 minutes 25 seconds East, 204.81 feet to a point, thence
6. North 57 degrees 01 minutes 06 seconds East, 49.50 feet to a point, thence
7. North 76 degrees 16 minutes 08 seconds East, 104.27 feet to the end of said 20 foot wide Sanitary Sewer Easement which containing 9,596 square feet or 0.2203 are of land, more or less.

This easement shall not prevent the installation and maintenance of any utility lines deemed necessary for the use of the owners of Parcel 388, as long as such installation and maintenance does not impede, disrupt or damage any pipe serving said Parcel 227.

The recordation of this document will also grant a blanket access easement for the purpose of installation and maintenance of any Sanitary Sewer and/or Septic Structures and appurtenances, situated on this easement through Parcel 388, from the existing Macadam Driveway on Parcel 388. Repairing of any damages occurring as a result of such access shall be the responsibility of the owner or owners of Parcel 227.



**LEGAL DESCRIPTION OF
SEPTIC DISPOSAL EASEMENT-1
ON PARCEL 388 FOR THE BENEFIT OF PARCEL 227
TAX MAP 40, GRID 7, HOWARD COUNTY, MARYLAND**

BEING a piece of land situated on that property which was granted and conveyed to William E. Tucker and Dayna K. Tucker by deed dated April 25, 2007 and recorded among the Land Records of Howard County, Maryland in deed book 10708 at folio 270, said Tucker property is also known as Parcel 388 at Tax Map 40, Grid 7, more particularly described as follows;

BEGINNING at a point said point is located North 04 degrees 26 minutes 41 seconds West, 5.00 feet from the end of the centerline of the 20 foot wide sanitary sewer easement, which is intended to be recorded herewith, thence leaving said point and running through, over and across said Parcel 388 for the following four (4) courses and distances;

1. North 85 degrees 40 minutes 44 seconds East, 55.87 feet to a point, thence
2. South 04 degrees 28 minutes 01 seconds East, 39.41 feet to a point, thence
3. South 89 degrees 09 minutes 54 seconds West, 56.00 feet to a point, thence
4. North 04 degrees 26 minutes 41 seconds West, 36.00 feet to the point of beginning, containing 2,107 square feet or 0.0484 are of land, more or less.

The recordation of this document will also grant a blanket access easement for the purpose of installation and maintenance of any Sanitary Sewer and/or Septic Structures and appurtenances, situated on this easement through Parcel 388, from the existing Macadam Driveway on Parcel 388. Repairing of any damages occurring as a result of such access shall be the responsibility of the owner or owners of Parcel 227.



**LEGAL DESCRIPTION OF
SEPTIC DISPOSAL EASEMENT-2
ON PARCEL 388 FOR THE BENEFIT OF PARCEL 227
TAX MAP 40, GRID 7, HOWARD COUNTY, MARYLAND**

BEING a piece of land situated on that property which was granted and conveyed to William E. Tucker and Dayna K. Tucker by deed dated April 25, 2007 and recorded among the Land Records of Howard County, Maryland in deed book 10708 at folio 270, said Tucker property is also known as Parcel 388 at Tax Map 40, Grid 7, more particularly described as follows;

BEGINNING at a point on the southerly or the North 69 degrees 15 minutes 21 seconds West, 438.23 foot property line of the 10 foot wide portion of said Parcel 388, said line is also the northerly property line of that property which was granted and conveyed to Edward Trivelli and Katherine Trivelli by deed dated April 25, 2007 and recorded among the same Land Records in deed book 10708 at folio 296, said Trivelli property is also known as Parcel 227 at Tax Map 40, Grid 7, said point of beginning is situated 103.91 feet from the eastern end of said property line, thence running along a portion of said property line;

1. North 69 degrees 15 minutes 21 seconds West, 26.92 feet to a point, thence leaving said property line and running through, over and across said Parcel 388 for the following two (2) courses and distances;
2. North 36 degrees 18 minutes 58 seconds East, 7.23 feet to a point, thence
3. South 53 degrees 41 minutes 02 seconds East, 25.93 feet to the point of beginning, contains 94 square feet or 0.0022 are of land, more or less.

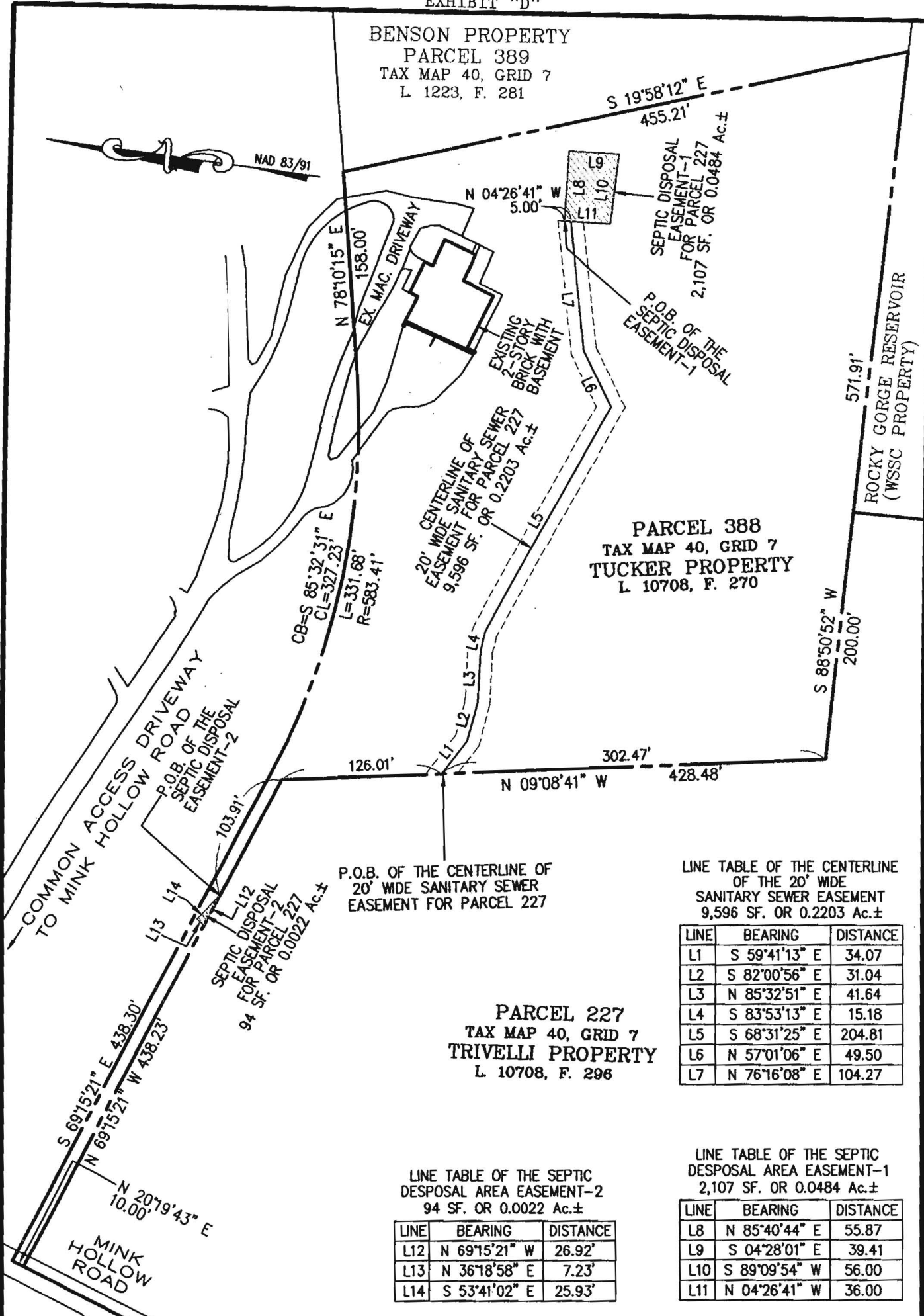


BENSON PROPERTY
 PARCEL 389
 TAX MAP 40, GRID 7
 L 1223, F. 281

PARCEL 388
 TAX MAP 40, GRID 7
 TUCKER PROPERTY
 L 10708, F. 270

PARCEL 227
 TAX MAP 40, GRID 7
 TRIVELLI PROPERTY
 L 10708, F. 296

ROCKY GORGE RESERVOIR
 (WSSC PROPERTY)



P.O.B. OF THE CENTERLINE OF
 20' WIDE SANITARY SEWER
 EASEMENT FOR PARCEL 227

LINE TABLE OF THE CENTERLINE
 OF THE 20' WIDE
 SANITARY SEWER EASEMENT
 9,596 SF. OR 0.2203 Ac.±

LINE	BEARING	DISTANCE
L1	S 59°41'13" E	34.07
L2	S 82°00'56" E	31.04
L3	N 85°32'51" E	41.64
L4	S 83°53'13" E	15.18
L5	S 68°31'25" E	204.81
L6	N 57°01'06" E	49.50
L7	N 76°16'08" E	104.27

LINE TABLE OF THE SEPTIC
 DISPOSAL AREA EASEMENT-2
 94 SF. OR 0.0022 Ac.±

LINE	BEARING	DISTANCE
L12	N 69°15'21" W	26.92'
L13	N 36°18'58" E	7.23'
L14	S 53°41'02" E	25.93'

LINE TABLE OF THE SEPTIC
 DISPOSAL AREA EASEMENT-1
 2,107 SF. OR 0.0484 Ac.±

LINE	BEARING	DISTANCE
L8	N 85°40'44" E	55.87
L9	S 04°28'01" E	39.41
L10	S 89°09'54" W	56.00
L11	N 04°26'41" W	36.00

FILE No.
 2638

PLAT OF EASEMENT
 SANITARY SEWER AND SEPTIC DISPOSAL AREA
 THROUGH PARCEL 388, TAX MAP 40, L. 10708, F. 270
 FOR THE BENEFIT OF
 PARCEL 227, TAX MAP 40, L. 10708, F. 296
 FIFTH ELECTION DISTRICT, HOWARD COUNTY, MARYLAND
 SCALE: 1" = 100' DATE: SEP. 04, 2007



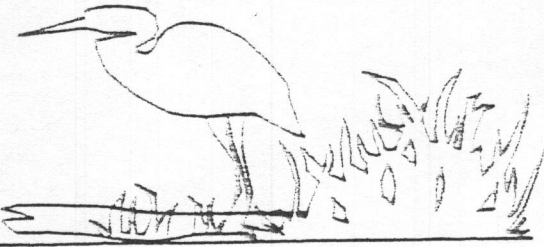
M.N. ROSHAN, L.S.
 MD REG. No. 11049

DATE

09/04/07



NJR & ASSOCIATES, LLC.
 LAND SURVEYING AND PLANNING
 8015 DORSEY RUN ROAD, SUITE "B"
 JESSUP, MARYLAND 20794
 TEL: (410)799-9089 FAX: (410)799-9093



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

Approved Septic System Plan
Howard County Health Department

William J. Lewis 11/16/07
Signature Date

Parcel 388

Project Title: EDWARD TREVELLI

Address: 7491 MINK HOLLOW ROAD (PARCELS 227 & 388) - HIGHLAND MARYLAND

Revision thru:
7/31/2007

APPROVED FOR PRIVATE WATER AND PRIVATE SEWERAGE
SYSTEMS IN CONFORMANCE WITH THE MASTER PLAN OF HOWARD COUNTY

Howard County Health Officer

Date

2007 AUG 17 AM 11:44
HOWARD COUNTY HEALTH DEPARTMENT
RECEIVED

WASTEWATER DISPOSAL SYSTEMS
LINKED PROJECT

TREVELLI [PARCEL 227] AND TUCKER [PARCEL 388] PROPERTIES

VICINITY, 7491 MINK HOLLOW RD HIGHLAND, MD

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TREVELLI PROPERTY
Parcel 227/388
7491 Mink Hollow
Highland, MD

Sheet Title:
WASTEWATER
SYSTEM
PLAN

Sheet#

WWT

of Sheets



INNOVA, LTD
INNOVATIVE WASTEWATER TREATMENT SYSTEM

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

(410) 875-9370 Office

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

73067

Trevelli Properties March 2006
Parcel 227 and adjacent Parcel 388 property
7491 block, Mink Hollow Road
Highland, Maryland [Howard County] 20777

Wastewater Disposal for:

To establish site requirements, Mr. Ed Trevelli initiated perc testing procedure with the **Howard County Bureau of Environmental Health [HCBEH]** for Parcel 227 (four bedroom new construction) March 2006. Review, and discussion of early test results, and potential physical restrictions to potential septic disposal field layout [see 2-18] prompted Mr. Trevelli to explore utilizing a part of his adjacent, and contiguous property, Parcel 388 [7491 Mink Hollow Road] to provide adequate septic disposal for Parcel 227. Testing of Parcel 388 demonstrated sufficient space and quality to provide reserve septic fields for each property. During this final testing phase, Mr. Trevelli sold Parcel 388 and the existing home, with agreement (of buyer) to provide easement, locating a reserve disposal field for Parcel 227, on a designated portion of 388, which he would pursue with the HCBEH. Note: the parcels were recorded prior to November 17, 1985 and not encumbered by specific requirement, and as such must provide an initial, and one reserve disposal field.

Bureau representatives, after site review, issued the following, in response to the request:

Parcel 227

Following testing, and topographic evaluation, Parcel 227 could provide adequate wastewater disposal for no more than one field [Sand Mound disposal area]. No suitable reserve area is available on the parcel. *Close proximity to flood plain soils, and steep topography. If used, property will require wastewater stream pretreatment.*

Parcel 388,

Home (5 Bedroom) previously owned by Mr. Trevelli, equipped with septic/seepage pit system (a system type no longer considered safe and adequate by MDE or HCBEH) that should be replaced. In place of the seepage pit - two, new septic disposal trench areas (Initial, and reserve) should be identified, and house connection made to the new initial septic disposal area. An alternative is possible, **pretreat the wastewater stream.** **Pretreatment of the wastewater stream** would allow the continued use of the seepage pit, and only one reserve field would be needed for Parcel 388.

Perc testing results compared with strong topographic features of the Parcel allow one large (reserve) disposal area for 388, but it would be difficult to find another of equal size sheet [15-18]. A smaller field is possible, and would be suitable for Parcel 227.

HCBEH agreed to allow placement of a reserve septic disposal area for parcel 227, on Parcel 388, subject to properly recorded and filed access, and use easement (s) agreement, allowing construction of the disposal field and associated piping trenches necessary to serve the use.

Parcel 388 is a five (5) bedroom home, **flow 750 gallons per day (24 hours)**
Parcel 227 new construction four (4) Bedroom, **flow 600 gallons per day (24 hours).**

HCBEH Stipulations:

(1) sufficient reserve disposal area must be demonstrated for the existing 5 bedroom home on parcel 388.

(2) Mr. Trevelli must document the long term easement agreement with owner of parcel 388 granting, future access for installation, and use of designated piping trenches, and reserve disposal field for Parcel 227, and shown on Parcel 388 (sheets 2-18 and 15-18).

(3) Wastewater systems of the Parcels must reduce the strength (BOD₅, TN) of the wastewater discharged to the soils by employing **advanced pretreatment** technology. Parcel 388 will be permitted to continue utilization of the existing seepage pit serving the home, and Parcel 227 may dispose of treated wastewater to the initial field sand mound, adjacent to flood plain soils of the Patuxent River.

Both properties are designated by HCBEH as **restricted** from any increase, in number of bedrooms, or unapproved floor space, subject to HCBEH approval, or until such time as public sewer is made available to the properties.

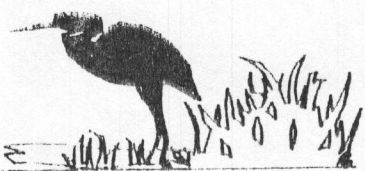
A well box must be shown within the boundaries of parcel 388 for future well replacement.

Perc Certification Plan must be provided.

Set back Variance - necessary it be requested, Parcel 227 (sheet 16-18) Upper left corner (upslope setback) of the sand mound structure protrudes 5' into adjoining property neck. Compound slopes, and flood plain setbacks provide little flexibility to adjust the mound grading structure (no portion of the absorption bed is within 9' of the boundary). A 5' variance to the normal 10' setback must be requested of the HCBEH, and a flexed extension of the property neck boundary executed about 10' upslope from the upper left mound corner.

The following sheets provide description, calculations, and design detail for the above systems. Construction should only be undertaken by MDE Certified Sand Mound installer.

TREVELLI PROPERTY Parcel 227 7491 Mink Hollow Rd Highland, MD
Sheet Title: WASTEWATER SYSTEM PLAN
Sheet# WWTP-1 1 of 9 Sheets



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INNOVATIVE WASTEWATER TREATMENT SYSTEMS

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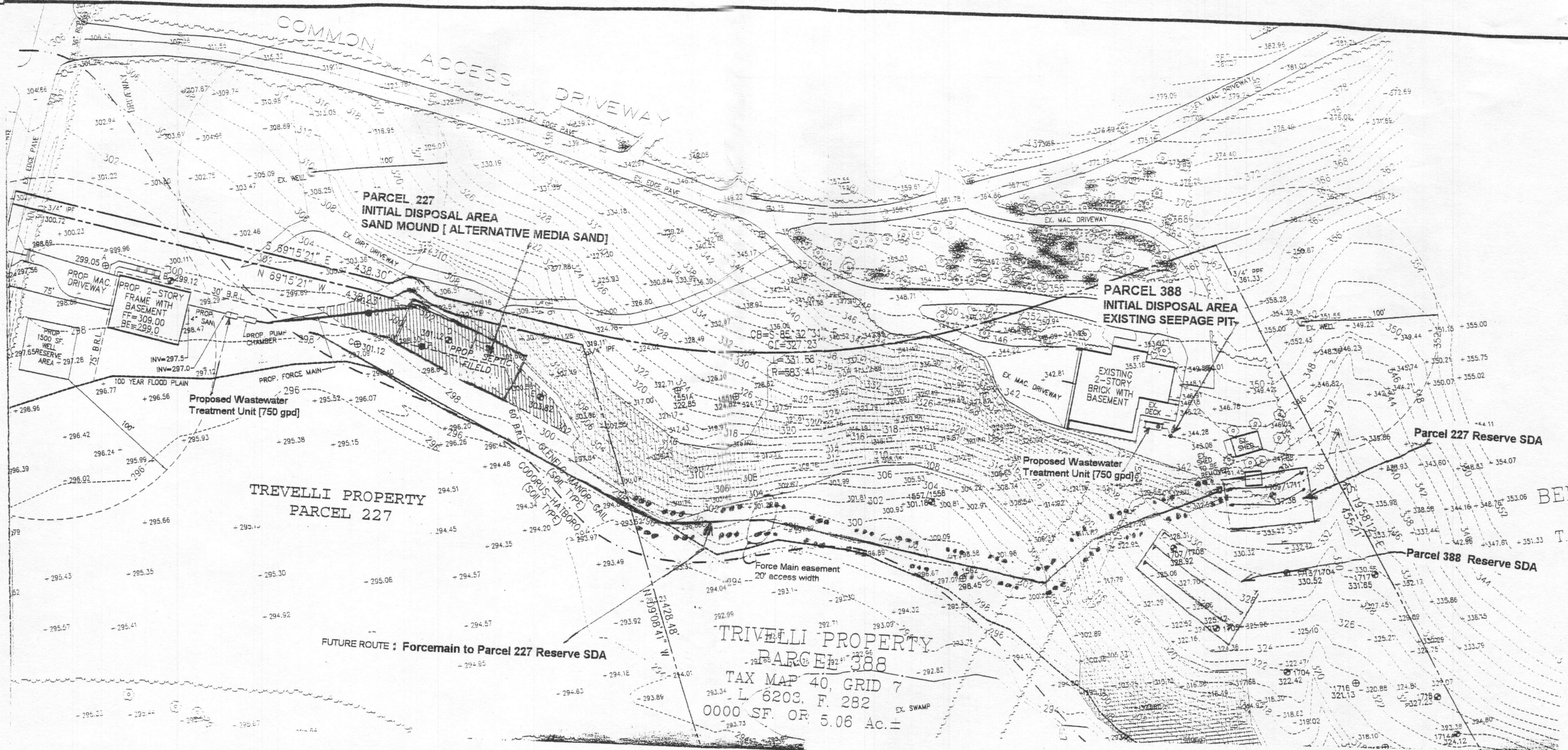
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TRIVELLI PROPERTY
Parcel 227/388
7491 Mink Hollow Rd
Highland, MD

Sheet Title:
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SYSTEM
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2 of 9 Sheets

TEST DATA

PARCEL 227 - New Construction

SAND MOUND TESTS

Test(date)	Depth	Infiltrometer Time (Min./inch)	
A- 4/28/06	14 1/2"	failed by HCBEH- mottles @ 18"	-
B- 4/28/06	18"	Not Tested	-
C- 4/28/06	18"	failed by HCBEH - mottles @ 18"	water detected @3'
D- 4/28/06	16"	50 minutes	mottles @ 5'
E-4/28/06	16"	50 minutes	Damp/Mottles @5'
F-3/27/07	24"	80 minutes	Fragi-pan 38"
G-3/27/07	24"	50 minutes	Water seep @38"

DEEP TRENCH TESTS [conducted on Parcel 388, results from HCBEH field notes]

Test(date)	Depth(s)ft.	Time (s) [Min./inch] note:	Status
1551 7/21/06	2.5/ 8'	>30 min.	fail
1551A 7/21/06	6/11'	>30 min.	fail
1557/1558 7/21/06	4/10.5'	20 min [marginal pass]	MP
1562 7/21/06	5.5'	mottles @ 4,5'	fail
1709/1711 8/15/06	5/11'	4 min.	Pass
1707/1708 8/15/06	6/12'	29 min.	Pass
1705 8/15/06	5/12'	21 min.	Pass
1704 8/15/06	5/12'	8 min.	Pass
1704/1713 8/15/06	7/12'	6 min.	Pass

TREVELLI PROPERTY
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RESERVE AREAS

Parcel 388 - Verification of Reserve Disposal Field and additionally, the designation of an Easement Area to be used as Reserve Disposal for Parcel 227.

DEEP TRENCH -
PARCEL 388 - Design Flow 750 g.p.d.

Use tests 1707/1708 & 1705
25 min. Average @ 250 ft² absorption area./bedroom*: 5X 250 =1250 ft²,

hence: 1250 ft², divided by 3' width = 417 Ln.ft. tile field length.

Deep Trench equation** (d)= 63% of ,Tile field length with 2' stone depth

417' X 63% = 263 Ln. ft. of deep trench laterals, or 3 - 88' runs X 3' wide X 2' stone below the pipe (bottom @ 8')

1704/1713 passed, but was not used [Stone depth limited to 1']. A 25' set back was maintained from this test point to either Reserve Area .

PARCEL 227 - Design Flow 600 gpd

1709/1711 passed @ 5'/11' with a 4 minute rate = 460 ft² (115 ft² bedroom*)

hence: 460 ft², divided by 3' width = 154 Ln.ft. tile field length.

Deep Trench equation, COMAR 26.04.02.05 K. (d)= 63% of ,Tile field length with 2' stone depth

154' X 63% = 97.02 say 98 Ln. ft. of deep trench laterals, or 2 - 49' trenches X 3' wide X 2' stone below the introductory pipe (bottom @ 8')

* COMAR 26.04.02.05

** COMAR26.04.02.05.I.(1) and K.

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TREVELLI PROPERTY
PARCEL 227 NEW CONSTRUCTION

SAND MOUND TESTING

PARCEL 227

- Anticipated Design Flow: 600 g.p.d.
- Failed Tests A, B, and C are located to the left side of the proposed Mound structure [viewed from foot of slope], and more than 25' from the Mound footprint.
- Passed Tests: Test G' - less than 25' to the left side of the mound structure, between the 299' and 300' contour lines, is indicative of conditions beneath and along that contour position. When arithmetically averaged with Test D' (In absorption bed), F' (down slope), and Test E' (right side of Mound, less than 25' from footprint) the average rate is between 57 and 58 minutes per inch.
- Limiting depth is 38", and Mound Lateral pipe delivery point is 72" above the limiting depth.

	Four Tests -
	G' 50 min. inch
	F' 80 min. Inch
	E' 50 min. inch
	D' <u>50 min. inch</u>
Total	230 min. Inch

Basal Area required for Mound:

$$230 \text{ min.} \div 4 \text{ tests} = 57.50 \text{ min. Inch} = 0.5 \text{ gpd/ft}^2 *$$

@ 600g.p.d. Design Flow: Basal Area = 1200 ft² (minimum)

* Table 3.3, MDE Design & Construction Manual for Sand Mounds, June 1991
46-60 minute infiltration rate

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SAND MOUND DESIGN SHEET

Documented (prior to 11/17/85) Parcel 227/ lot requires an Initial, and replacement disposal area.

600 G.P.D. Design Flow

Initial Septic Disposal Area (SDA#1) is Sand Mound Disposal

Replacement area (SDA#2) is deep trench configuration, by easement agreement, and located on Parcel #388 (see 3-17)

SAND MOUND DESIGN

(SDA #1) Alternative Sand Media MOUND: SM test locations C, D, E, F, and G (see 2-17)

[Designed in accordance with MDE Design and Construction Manual for Sand Mound Systems, June 1991, Alternative Sand for Mounds MDE memo Sept. 2003, and the Converse /Tyler Wisconsin Sand Mound Design Manual (exerpts) update (sand media quality) of January 2000 which supports that memo]

Mound Area: 8% fall across contour width [contour 304' to 296']. Slope position, mostly level, with gentle, convergent footslope-

ABSORPTION BED: 600 Gal +1.0 gpd per ft² (sand loading rate, alternative sand media) = 600ft²

BED WIDTH (selected width)(A) = 9.0 feet BED LENGTH (B) 600ft² + 9.0ft. = 66 feet

UPSLOPE FILL (D) = 24 inches (specified by HCBEH)

DOWNSLOPE FILL (E) 12 X 9'X 8% slope + 24" = 33 inches

CAP + TOPSOIL FILL (at Bed Center) (H) = 18 inches

CAP + TOPSOIL FILL (at Bed Edge) (G) = 12 inches

TOTAL BED DEPTH (F) = 10 inches MOUND HEIGHT = 57 inches (center/ to soil surface)

SIDE SLOPE SETBACK (K) = 169.5 inches (14 feet 2 inches)

UPSLOPE SETBACK (J) 8% slope (.88 corr.) = 110.4 inches (9 feet 2 inches)

DOWNSLOPE SETBACK 8% slope (1.32 corr.) (I) = 225.7 inches (18 feet 10 inches)

TOTAL WIDTH (W) = 444.1 inches TOTAL LENGTH (L) = 1131 inches
or (W) = 37 feet x (L) = 94 feet 3 inches

Basal Area required: 600 gpd Design Flow = 1200 ft²

.50 gpd/ft² (46-60 minutes/inch) (4 test average, 58 minutes/inch)

[Soil Loading (Manual, table 3.3 silt loams, silty clay loam 46-60 min.)

Basal Area (sloped) provided: [(A+I) X B] = 1,914 ft² 1200 / 1914 [adequate]

Linear Loading (allowed, <10gpd) : 600 gpd + 66' (bed) = 9.09 gpd/ft,

INSTALLATION:

Follow the recommended installation schedule as found in Section 5, "Construction Procedures" in the DESIGN AND CONSTRUCTION MANUAL FOR SAND MOUND SYSTEMS (June 1991), also plate 17-17 of this submittal.

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Wastewater Distribution System [Sand Mound]
Parcel 227

Selected Dose:

Lesser of, 1/6 design flow, or total of piping volume [Force Main/ Manifold (FM/M) + 5 X all Laterals] *Note, pipe flow velocity is the critical design parameter of the field flow calculation*

1/6 Design Flow : 600 gpd. + 6 = **100 gal.**

Pipe Volume : FM/M (2" PVC, selected) 170' + 5 X [132' - 2" PVC Laterals]
2" PVC = 17.4 gal./100'

Thus: 17.4 X 1.7 = 29.58 gal.+ 115gal. [23 gal (4 laterals)X 5] = **144.58 gal.**

USE: 100 gal. each dose

Low Pressure Distribution Piping

- Apply Bureau of Environmental Health preferred **5/16" perforations** and **2' field hydraulic operating head** to provide minimum 1.63 GPM flow per perforation.
- Flow from perforations must allow a scouring/flush velocity of 2-5 feet per second (cfs) in the lateral piping. 2" diameter PVC lateral piping provides adequate flow velocity across delivery range of 23 to 55 gallons per minute (Friction Loss and Flow Velocity Tables, Sch 40 PVC Pipe).
- Thirty (32) system perforations @ 1.63 gpm deliver an adequate 52 gpm, referred to as the minimum system discharge rate [13 gpm/lateral].
- Two, pipe runs of 2" PVC, divided by center manifold, into four laterals accommodate the 32 perforations at spacing of 4.06 feet (49") and meet MDE design criteria* (fig. 4.3). The last perforation in each lateral is located in the crown of the lateral end-cap approximately 6" from the absorption bed end. A Lateral pipe length is 32' 6", or 65' per bed run.

Bed Distribution - selected 9' width X 66' bed length requires the center manifold* feed of 4 Laterals, in two rows at 3' separation, with a 3' set back from the bed edges.

Location of first perforation in a lateral from the manifold:

$$(66' \times 50\%) - [(8-1) \times 4.062'] + 2 = 2.28' (27")$$

The initial perforation in each lateral is placed 27" from the manifold pipe center. All perforations are oriented downward into the absorption bed. Last perforation in a Lateral is located in the upper part of the end cap to vent trapped air.

*Design and Construction Manual for Sand Mound Systems, Maryland June 1991 (2nd Edition) and sand media loading revisions per Converse/Tyler, Wisconsin Mound Soil Absorption System #15.24: Siting, Design and Construction Manual - update of January, 2000

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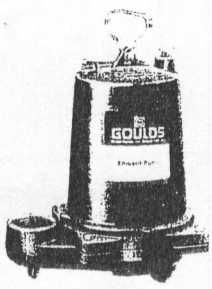
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Goulds
**Submersible
Effluent Pump**

MODEL
3885

APPLICATIONS

- Specifically designed for the following uses:
- Homes
 - Farms
 - Trailer courts
 - Motels
 - Schools
 - Hospitals
 - Industry
 - Effluent systems

SPECIFICATIONS

- Pump**
- Solids handling capabilities: 3/4" maximum
 - Discharge size: 2" NPT
 - Capacities: up to 128 GPM
 - Total heads: up to 123 feet TDH
 - Mechanical seal: silicon carbide-rotary seal/silicon carbide-stationary seal. 300 series stainless steel metal parts, BUNA-N elastomers.
 - Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
 - Fasteners: 300 series stainless steel.
 - Capable of running dry without damage to components.
- Motor**
- Single phase:**
- 1/2 HP, 115 V, 200 V, 230 V, 60 Hz, 1750 RPM, 1/2 HP, 115 V, 60 Hz, 3500 RPM, 1/2 HP - 1 1/2 HP, 230 V, 60 Hz, 3500 RPM.
 - Built-in overload with automatic reset.
 - Class B insulation.
- Three phase:**
- 1/2 HP - 1 1/2 HP 200/230/460 V, 60 Hz, 3500 RPM.
 - Class B insulation.

- Overload protection must be provided in starter unit.
- Shaft: threaded, 400 series stainless steel.
- Bearings: ball bearings upper and lower.
- Power cord: 20 foot standard length (optional lengths available).
- **Single phase:**
 - 1/2 and 1 1/2 HP - 16/3 SJTO with 115 V or 230 V three prong plug
 - 3/4-1 1/2 HP - 14/3 STO with bare leads.
- **Three phase:**
 - 1/2-1 1/2 HP - 14/4 STO with bare leads. On CSA listed models - 20 foot length SJTW and STW are standard.

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 adaptable for slide rail systems.

- **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 three phase models to guard against component damage on accidental reverse rotation.

- **Motor:** Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits,

can be operated continuously without damage.

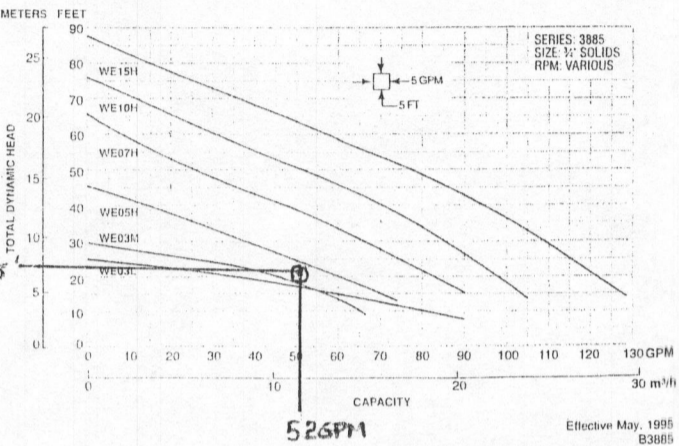
- **Bearings:** Upper and lower heavy duty ball bearing construction.

- **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.

- **O-ring:** Assures positive sealing against contaminants and oil leakage.

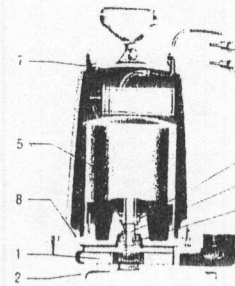
AGENCY LISTINGS

- Canadian Standards Association
- Underwriters Laboratories



PARTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical seal
4	Shaft
5	Motor
6	Bearings - upper and lower
7	Power cable
8	O-ring



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**Submersible
Effluent Pump**

MODEL
3885

MODELS

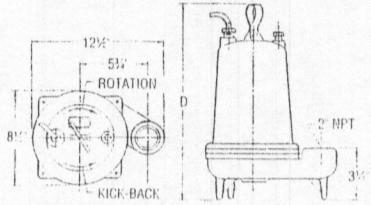
Order No.	HP	Volts*	Phase	Max. Amp.	RPM	3ø Heater Size	Wt. (lbs.)
WE0311L	1/2	115		9.4			56
WE0312L	1/2	230		4.7			
WE0318L	1/2	200		5.4			
WE0311M	1/2	115		9.4	1750		
WE0312M	1/2	230		4.7			
WE0318M	1/2	200		5.4			
WE0511H	1/2	115	1	14.5			
WE0512H	1/2	230	1	7.3			
WE0518H	1/2	200	1	8.4			
WE0538H	1/2	200	3	3.9		K32	
WE0532H	1/2	230	3	3.4		K32	
WE0514H	1/2	115	3	1.7		K21	60
WE0512HH	1/2	230	1	14.5			
WE0518HH	1/2	200	1	8.4			
WE0538HH	1/2	200	3	3.8		K32	
WE0532HH	1/2	230	3	3.2		K31	
WE0534HH	1/2	460	1	1.65		K21	
WE0712H	3/4	230	1	10.0			
WE0718H	3/4	200	1	11.5			
WE0738H	3/4	200	3	6.2	3500	K49	
WE0732H	3/4	230	3	5.4		K39	
WE0734H	3/4	460	1	2.7		K26	70
WE1012H	1	230	1	14.5			
WE1018H	1	200	1	14.5			
WE1038H	1	200	3	8.1		K43	
WE1022H	1	230	3	7.0		K43	
WE1034H	1	460	1	3.5		K32	
WE1512H	1 1/2	230	1	15.7			
WE1538H	1 1/2	200	1	10.6			
WE1532H	1 1/2	230	3	9.7		K50	
WE1534H	1 1/2	460	1	4.6		K36	
WE1512HH	1 1/2	230	1	15.0			
WE1538HH	1 1/2	200	1	10.6			
WE1532HH	1 1/2	230	3	9.2		K50	
WE1534HH	1 1/2	460	1	4.6		K36	

PERFORMANCE RATINGS (gallons per minute)

Order No.	Performance Ratings (gallons per minute)							
	1750	1750	3500	3500	3500	3500	3500	3500
HP	1/2	1/2	1/2	3/4	1	1 1/2	3/2	1 1/2
RPM	1750	1750	3500	3500	3500	3500	3500	3500
10	80	65	—	—	—	—	—	56
15	60	57	69	90	104	128	53	82
20	36	45	(60)	83	96	122	48	77
25	—	25	50	76	92	116	45	75
30	—	—	38	67	85	109	40	72
35	—	—	26	58	78	102	35	70
40	—	—	15	47	70	94	30	67
45	—	—	—	36	62	86	25	64
50	—	—	—	25	52	77	18	60
55	—	—	—	17	42	67	12	58
60	—	—	—	8	32	56	3	54
65	—	—	—	—	21	46	—	51
70	—	—	—	—	11	35	—	47
75	—	—	—	—	—	25	—	43
80	—	—	—	—	—	15	—	40
90	—	—	—	—	—	—	—	33
100	—	—	—	—	—	—	—	24
110	—	—	—	—	—	—	—	15
120	—	—	—	—	—	—	—	5

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)
D* 1/2, 1, 3/4 and 1 HP = 15"
except for model WE0712H and WE1012H = 18", 1 1/2 HP = 18"



EFFLUENT EJCTOR SYSTEM

Effluent ejector system offers ease of ordering and installation. A single ordering number specifies a complete system designed for most residential and commercial storm and effluent pump applications.

Package Includes:
Submersible Effluent Pump WE0311L, 12L or WE0311M, 120L, WE0511H or 12 Mechanical Level Control Section: A2-5 (115V), A2-6 (230V), Basin A2-1001S, Basin Cover A2-1222, Check Valve A2-20, Order As: SWE0311L, SWE0312L, SWE0311M, SWE0312M, SWE0511H, SWE0512H

GOULDS PUMPS
ITT Industries

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. PRINTED IN U.S.A.

Pump Determination

Based on field flow rate, and total dynamic hydraulic head(TDH)

Field flow rate: 52 gpm

TDH:

Static lift - Distribution Manifold 304.00'
Pump inlet (293.08')
Static Lift 10.92'

Friction Loss - 2" PVC @ 52gpm= 4.50'/100' pipe
2" Force Main [164'] : 1.64 X 4.50 = 7.38'

2" Fittings [equivalent 2" pipe length]

1 - side Tee @ 10' 10'
2 - 90° Ell @ 7' 14'
1 - 45° Ell @ 4' 4'

28' or .28 X 4.50 = 1.26

Friction Loss 8.64' 8.64'

Field Operating Head 2.00'

Total Dynamic Head (TDH) 21.55'

PUMP Recommendation

Enter Pump Curves @ 52 gpm / 21.55' TDH:

Gould Submersible Effluent, Model 3885
WE0512H (1/2 HP, 230 V, single phase)

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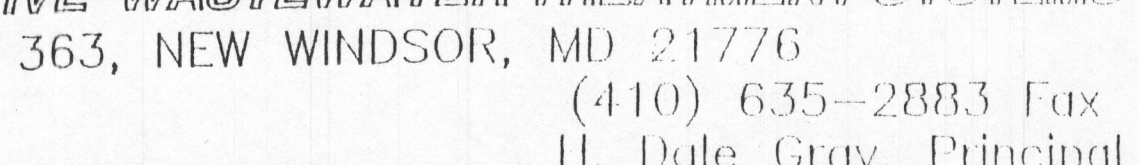
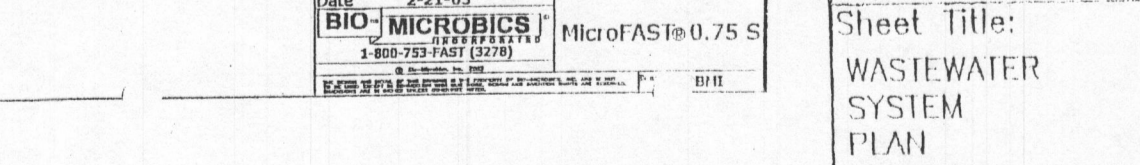
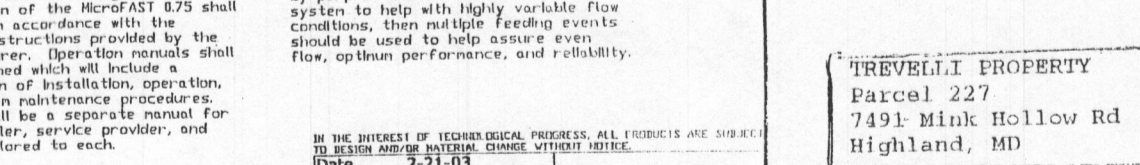
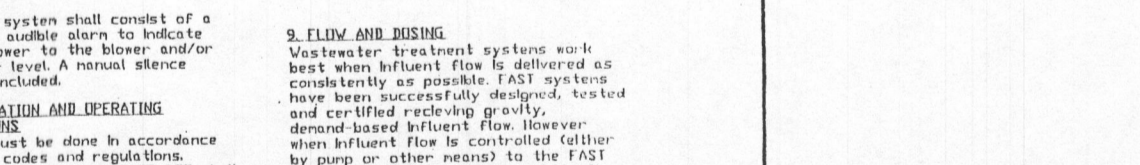
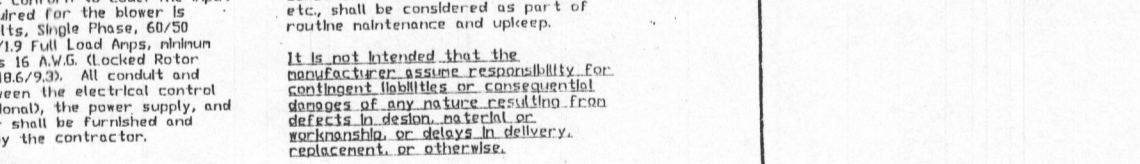
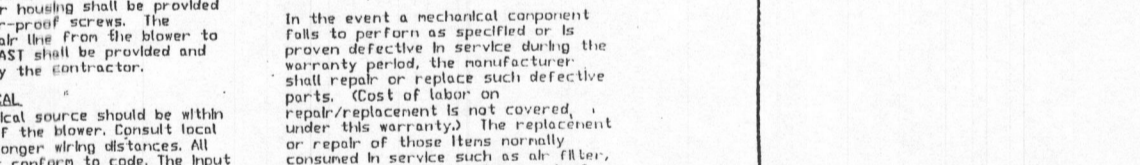
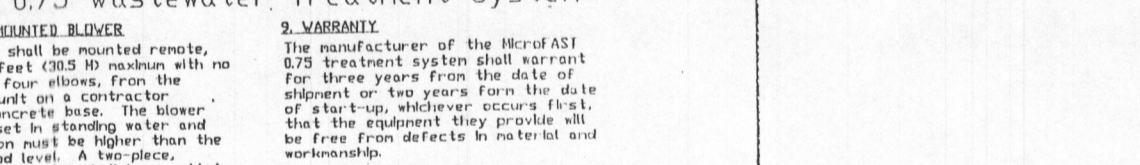
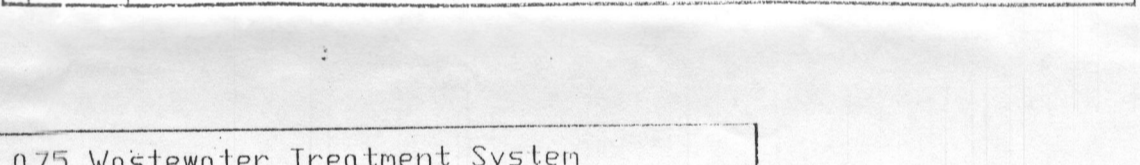
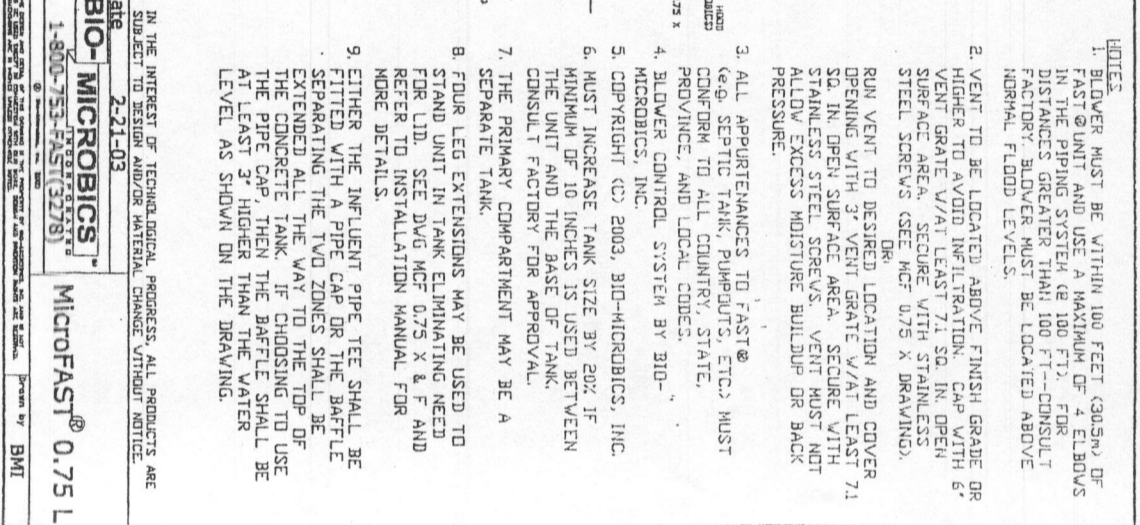
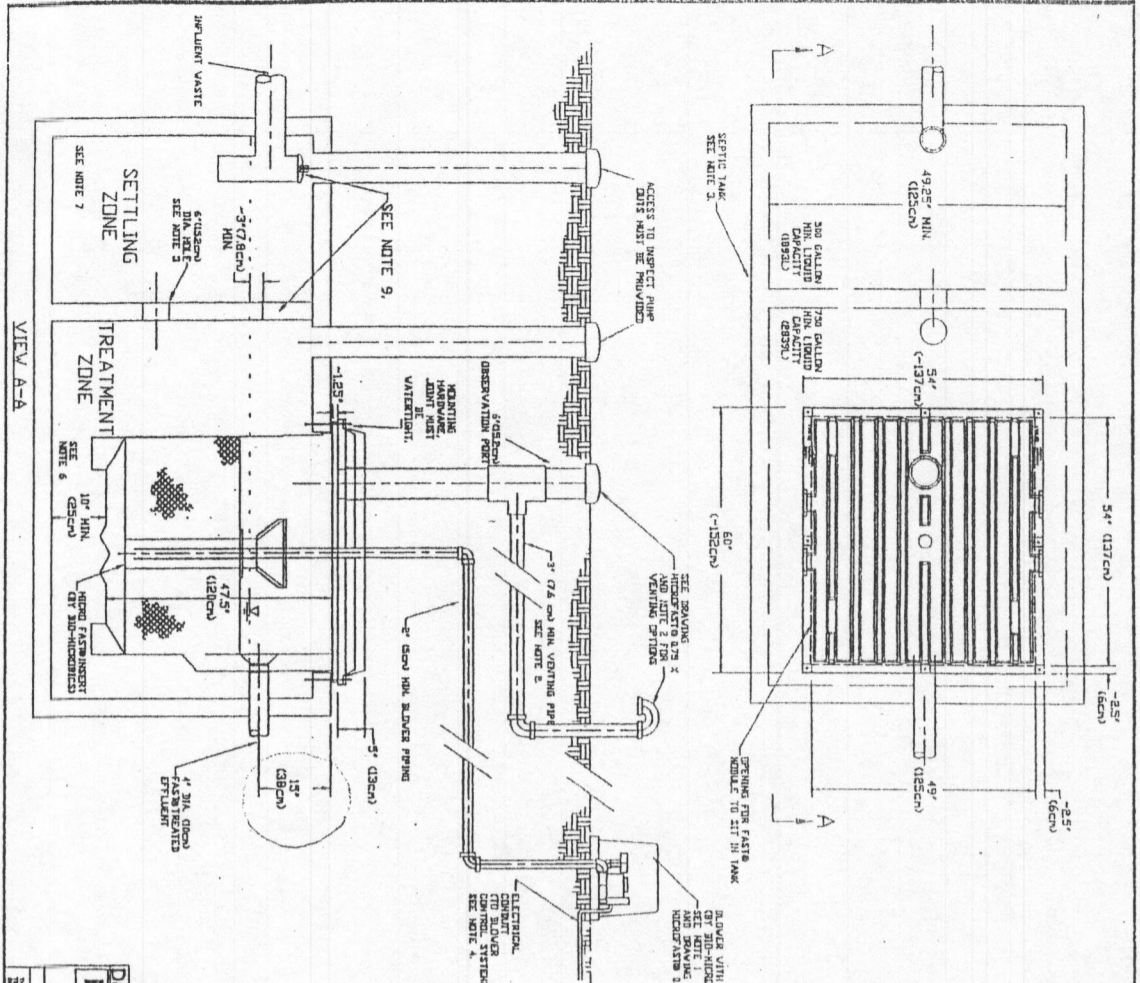
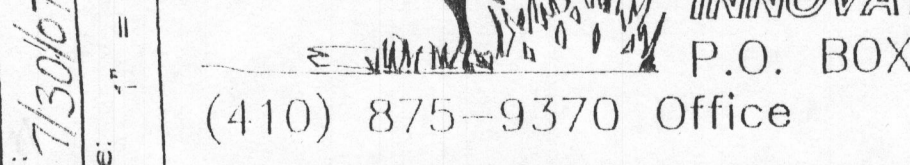
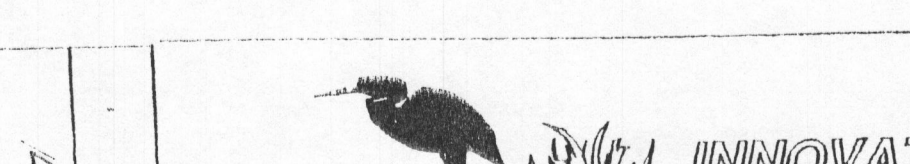
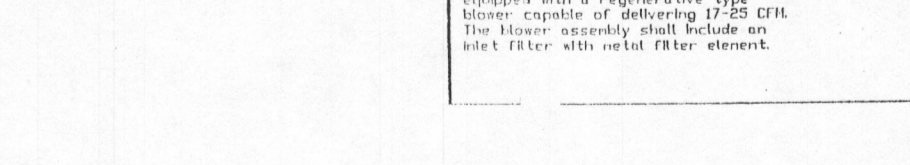
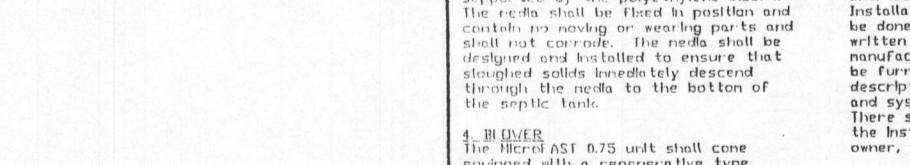
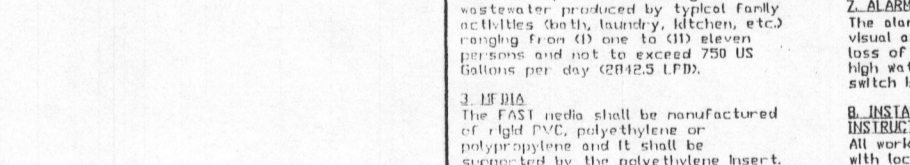
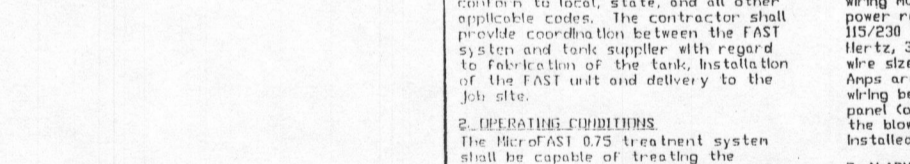
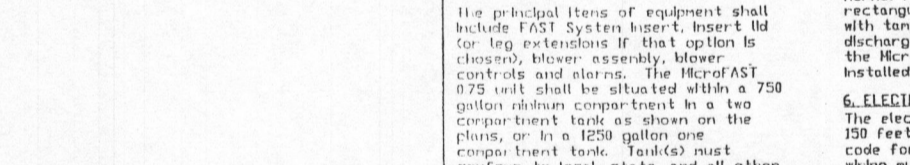
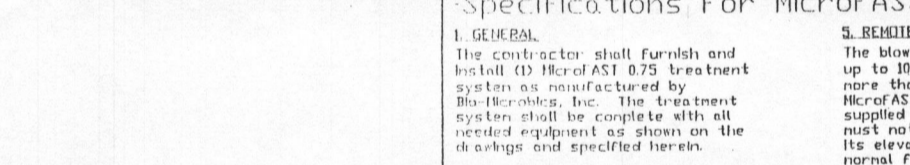
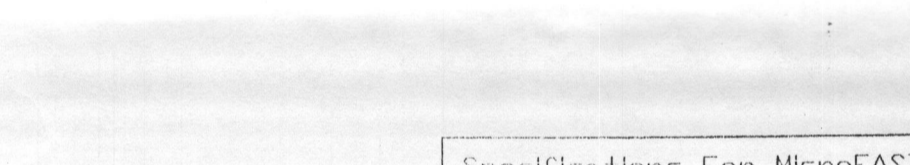
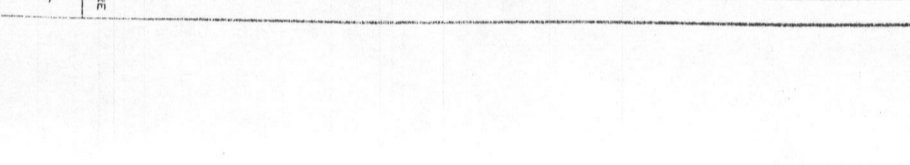
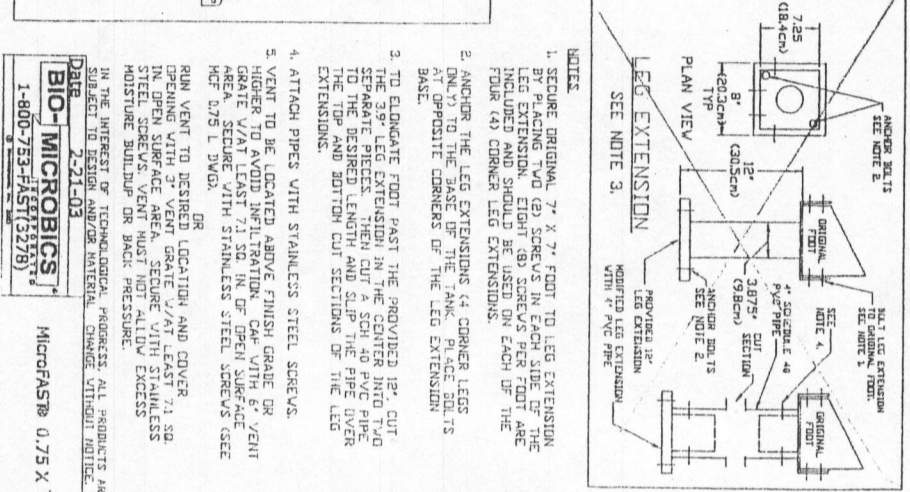
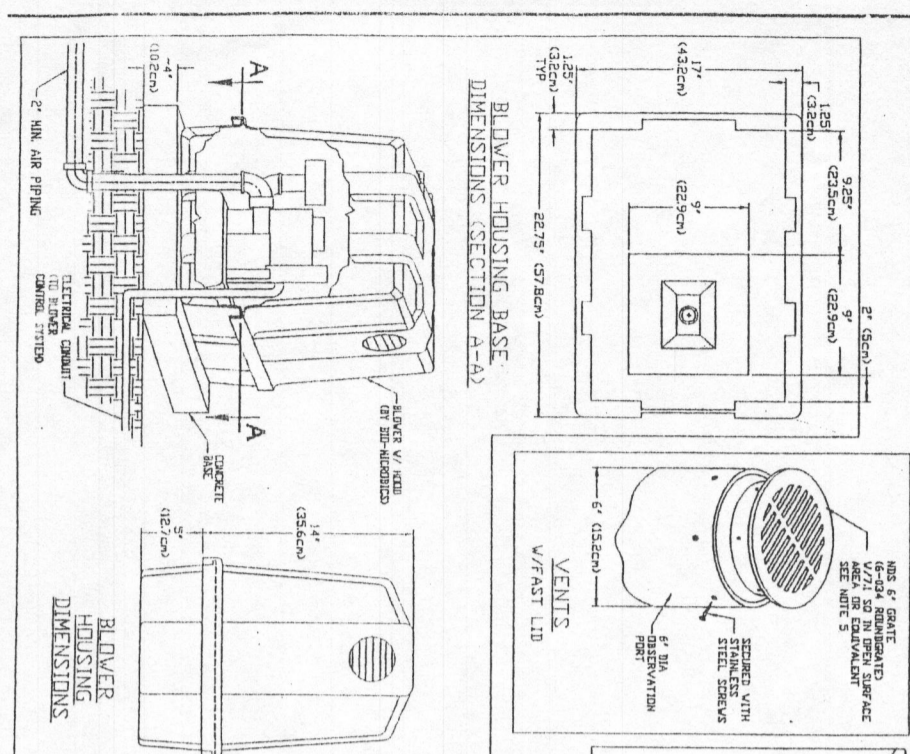
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H. Dale Gray, Principal

6/8/07
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NOTES:

1. BLOWER MUST BE WITHIN 100 FEET (30.5M) OF FAST UNIT AND USE A MAXIMUM OF 4 ELBOWS IN THE PIPING SYSTEM. FOR DISTANCES GREATER THAN 100 FT. CONSULT FACTORY. BLOWER MUST BE LOCATED ABOVE NORMAL FLOOD LEVELS.
2. VENT TO BE LOCATED ABOVE FINISH GRADE OR HIGHER TO AVOID INFILTRATION. CAP WITH 6" VENT GRATE W/AT LEAST 7.1 SQ. IN. OPEN SURFACE AREA. SECURE WITH STAINLESS STEEL SCREWS (SEE MCF 0.75 X DRAWING).
3. ALL APURTANCES TO FAST (e.g. SEPTIC TANK, PUMPS, ETC.) MUST CONFORM TO ALL COUNTRY, STATE, PROVINCE, AND LOCAL CODES.
4. BLOWER CONTROL SYSTEM BY BIO-MICROBICS, INC.
5. COPYRIGHT (C) 2003, BIO-MICROBICS, INC.
6. MUST INCREASE TANK SIZE BY 20% IF MINIMUM OF 10 INCHES IS USED BETWEEN THE UNIT AND THE BASE OF TANK. CONSULT FACTORY FOR APPROVAL.
7. THE PRIMARY COMPARTMENT MAY BE A SEPARATE TANK.
8. FLOOR LEG EXTENSIONS MAY BE USED TO STAND UNIT IN TANK ELIMINATING NEED FOR LID. SEE DVG MCF 0.75 X & F AND REFER TO INSTALLATION MANUAL FOR MORE DETAILS.
9. EITHER THE INFLUENT PIPE SHALL BE FITTED WITH A PIPE CAP OR THE BAFLE SEPARATING THE TWO ZONES SHALL BE EXTENDED ALL THE WAY TO THE TOP OF THE CONCRETE TANK. IF CHOOSING TO USE THE PIPE CAP, THEN THE BAFLE SHALL BE AT LEAST 3" HIGHER THAN THE WATER LEVEL AS SHOWN ON THE DRAWING.

Specifications For MicroFAST 0.75 Wastewater Treatment System

1. GENERAL
The contractor shall furnish and install (1) MicroFAST 0.75 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.

The principal items of equipment shall include FAST System Insert, Insert Lid (or leg extensions if that option is chosen), blower assembly, blower controls and alarms. The MicroFAST 0.75 unit shall be situated within a 750 gallon minimum compartment in a two compartment tank as shown on the plans, or in a 1250 gallon one compartment tank. Tank(s) must conform to local, state, and all other applicable codes. The contractor shall provide coordination between the FAST system and tank supplier with regard to fabrication of the tank. Installation of the FAST unit and delivery to the job site.

2. OPERATING CONDITIONS
The MicroFAST 0.75 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (1) one to (11) eleven persons and not to exceed 750 US Gallons per day (2012.5 LFD).

3. MEDIA
The FAST media shall be manufactured of rigid PVC, polyethylene or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids immediately descend through the media to the bottom of the septic tank.

4. BLOWER
The MicroFAST 0.75 unit shall come equipped with a regenerative type blower capable of delivering 17-25 CFM. The blower assembly shall include an inlet filter with metal filter element.

5. REMOTE MOUNTED BLOWER
The blower shall be mounted remote, up to 100 feet (30.5 M) maximum with no more than four elbows, from the MicroFAST unit on a contractor supplied concrete base. The blower must not set in standing water and its elevation must be higher than the normal flood level. A two-piece, rectangular housing shall be provided with tamper-proof screws. The discharge air line from the blower to the MicroFAST shall be provided and installed by the contractor.

6. ELECTRICAL
The electrical source shall be within 150 feet of the blower. Consult local code for longer wiring distances. All wiring must conform to code. The input power required for the blower is 115/230 Volts, Single Phase, 60/50 Hertz, 3.8/1.9 Full Load Amps, minimum wire size is 16 A.V.G. (Locked Rotor Amps are 18.6/9.3). All conduit and wiring between the electrical control panel (optional), the power supply, and the blower shall be furnished and installed by the contractor.

7. ALARMS
The alarm system shall consist of a visual and audible alarm to indicate loss of power to the blower and/or high water level. A manual silence switch is included.

8. INSTALLATION AND OPERATING INSTRUCTIONS
All work must be done in accordance with local codes and regulations. Installation of the MicroFAST 0.75 shall be done in accordance with the written instructions provided by the manufacturer. Operation manuals shall be furnished which will include a description of installation, operation, and system maintenance procedures. There shall be a separate manual for the installer, service provider, and owner, tailored to each.

9. WARRANTY
The manufacturer of the MicroFAST 0.75 treatment system shall warrant for three years from the date of shipment or two years from the date of start-up, whichever occurs first, that the equipment they provide will be free from defects in material and workmanship.

In the event a mechanical component fails to perform as specified or is proven defective in service during the warranty period, the manufacturer shall repair or replace such defective parts. (Cost of labor on repair/replacement is not covered under this warranty.) The replacement or repair of those items normally consumed in service such as air filter, etc., shall be considered as part of routine maintenance and upkeep.

It is not intended that the manufacturer assume responsibility for contingent liabilities or consequential damages of any nature resulting from defects in design, material or workmanship, or delays in delivery, replacement, or otherwise.

9. FLOW AND DOSING
Wastewater treatment systems work best when influent flow is delivered as consistently as possible. FAST systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow. However when influent flow is controlled (either by pump or other means) to the FAST system to help with highly variable flow conditions, then multiple feeding events should be used to help assure even flow, optimum performance, and reliability.

IN THE INTEREST OF TECHNOLOGICAL PROGRESS, ALL PRODUCTS ARE SUBJECT TO DESIGN AND/OR MATERIAL CHANGE WITHOUT NOTICE.

Date: 2-21-03

BIO-MICROBICS
1-800-753-FAST (3278)

MicroFAST® 0.75 S

BMI

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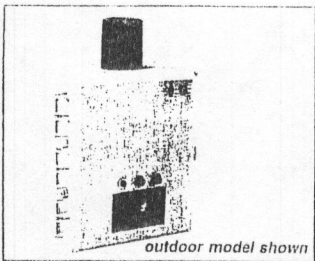
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10/30/01

MODEL 112 control panels

Single-phase, simplex motor contactor control.

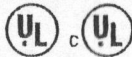


APPLICATIONS

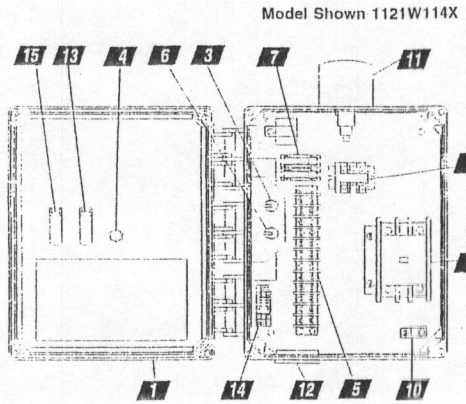
The Model 112 control panel provides residential and commercial customers with a reliable means of controlling one 120, 208, or 230 VAC single-phase pump in water and sewage installations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs,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

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



ALARM PACKAGE (OPTIONAL)

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



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 JS70) 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 1/2" 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.

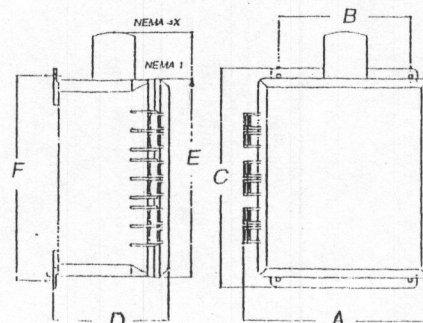
FOR INSTALLATION WITHOUT A SPLICE GO TO STEP 12. FOR INSTALLATIONS REQUIRING A SPLICE FOLLOW STEP 7 - 11.

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.

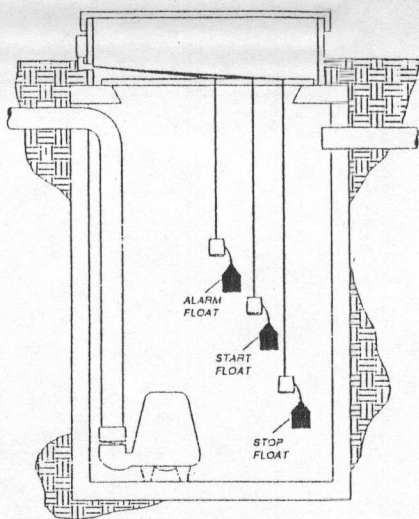
14. Connect "power in" conductors to proper terminals. (SEE WIRING DIAGRAM)



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

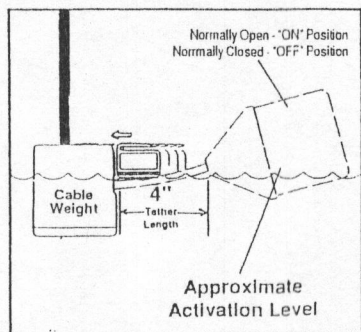


Figure 1 - Three Float Installation



Float installation shown is for a high level (pump down) system. To install a low level (pump up) system, stop float should be mounted at upper level, and a start float mounted at lower level. Start float remains as shown above. Wire connections to terminal strip are the same for a high or low level system.

Figure 2



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 S.O.W-A (UL), S.JOW (CSA) water resistant Neoprene.

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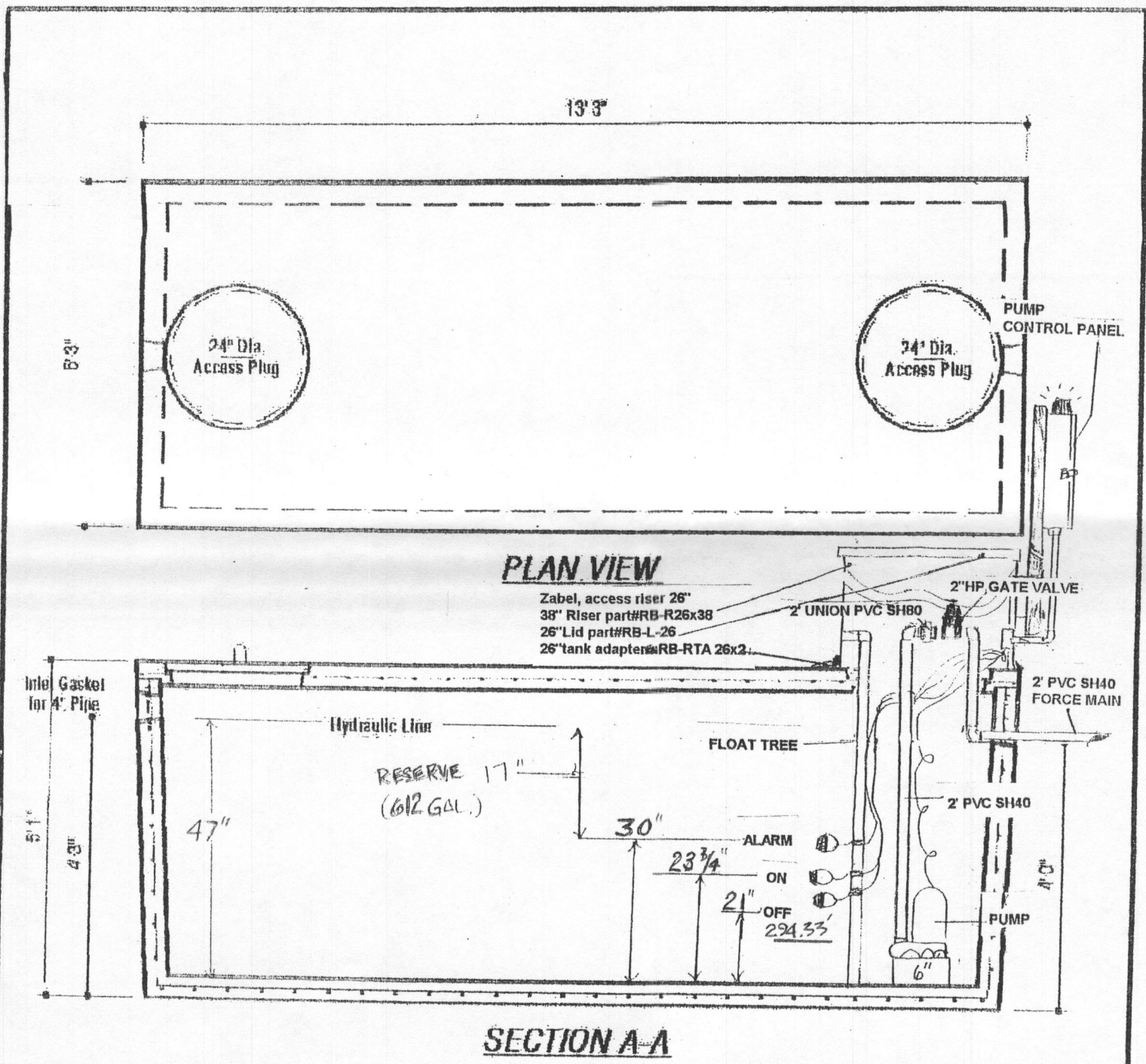
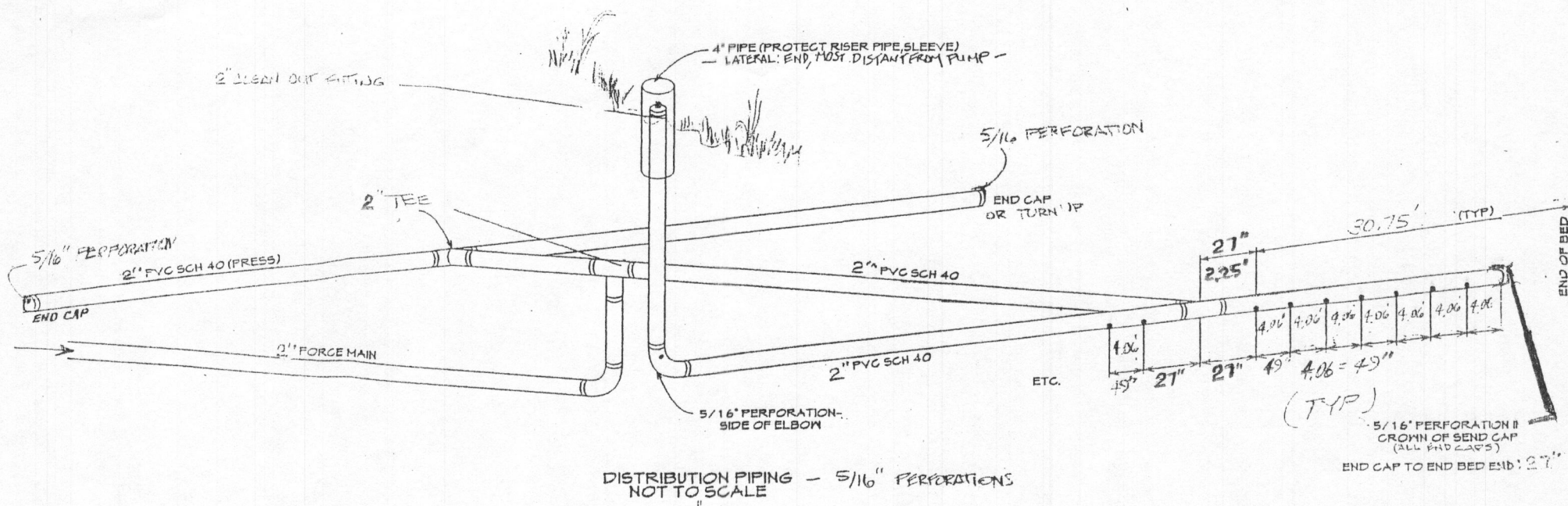


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H. Dale Gray, Principal



DESIGN DATA & GENERAL NOTES

- [1] Concrete strength $f_c = 4,000$ p.s.i. @ 28 days. Density = 150 pcf.
- [2] Cement - Portland Type I/II per ASTM C 150-92.
- [3] Admixtures & plasticizers per ASTM C 260-86 & C 494-92.
- [4] Reinforcing per ASTM A185. Min. 1-1/2" cover.
- [5] Top slab sealed with butyl rope mastic.
- [6] 4" wall, base, & top thickness.

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NON-TRAFFIC MAX 3 IN. OF COVER

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ALL BURIED PVC SERVICE LINES ON THIS PARCEL MUST BE MARKED WITH METAL LOCATOR TAPE

EXISTING 2-STORY BRICK WITH BASEMENT

Proposed MicroFAST® 0.75 Treatment System

EX. SHED

EX. SHED TO BE REMOVE

Future discharge (4" PVC) to reserve field area

CROSSING POINT OF SERVICE LINES

FUTURE "D" BOX

EASEMENT: PARCEL 227 RESERVE SDA [2016 FT² - 2' STONE DEPTH] TWO DEEP TRENCH RUNS

PARCEL 388 RESERVE SDA [3330 FT² - 2' STONE DEPTH] THREE DEEP TRENCH RUNS

20' WIDE EASEMENT: FUTURE FORCE MAIN (PARCEL 227)

PARCEL 388 RESERVE

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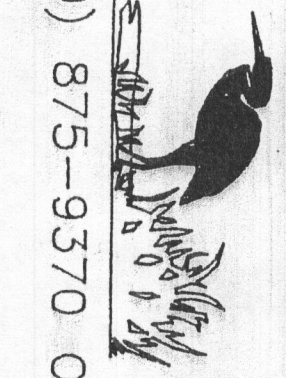
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FRAME WITH
BASEMENT
FF = 309.00
BE = 299.0

100 YEAR FLOOD PLAIN

11/15/07 - RELOCATION of Absorption Beds
TO BETTER SUIT FOR TO CONDUIT (Approx
Bottom 5' Down Slope of Rear Avenue)

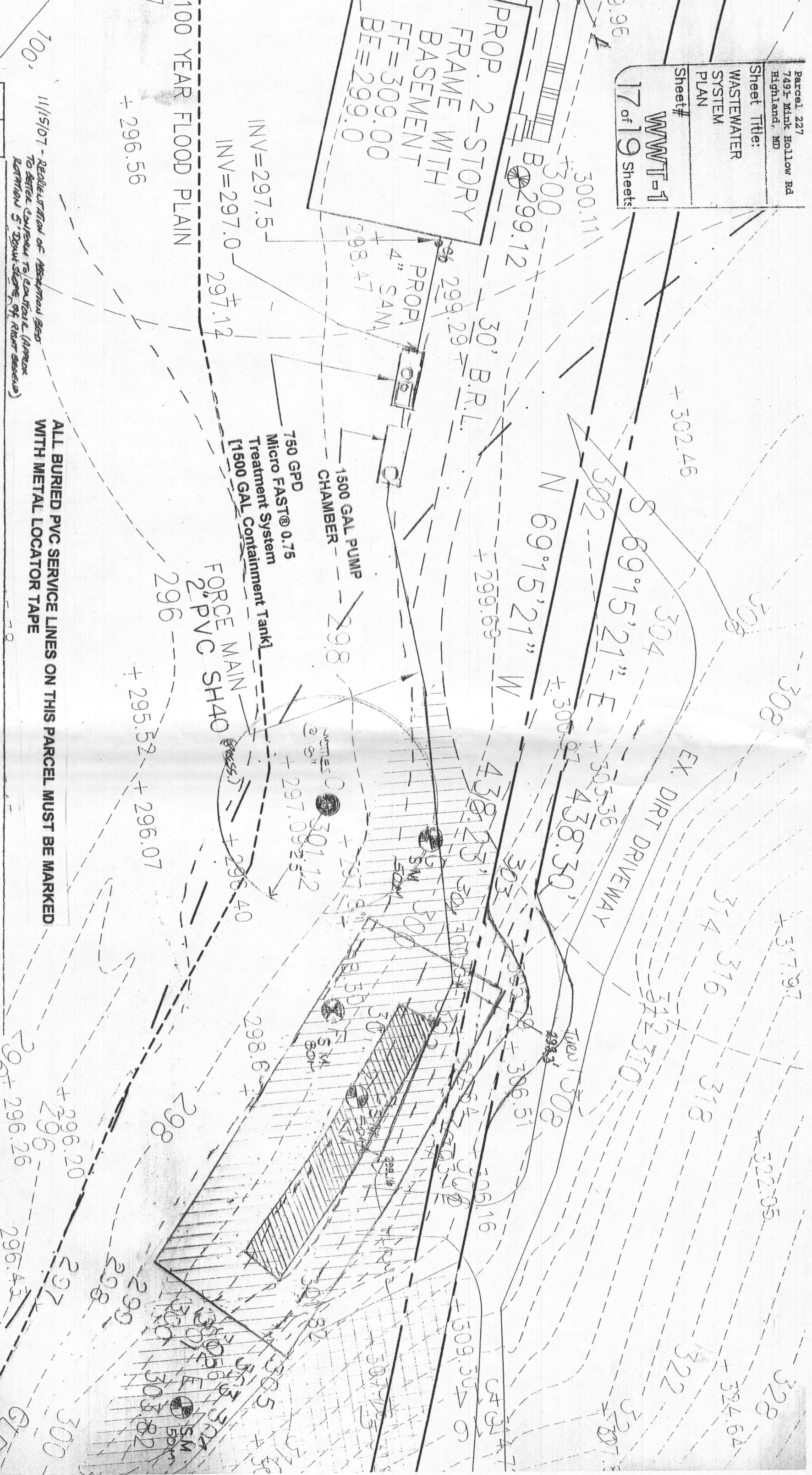
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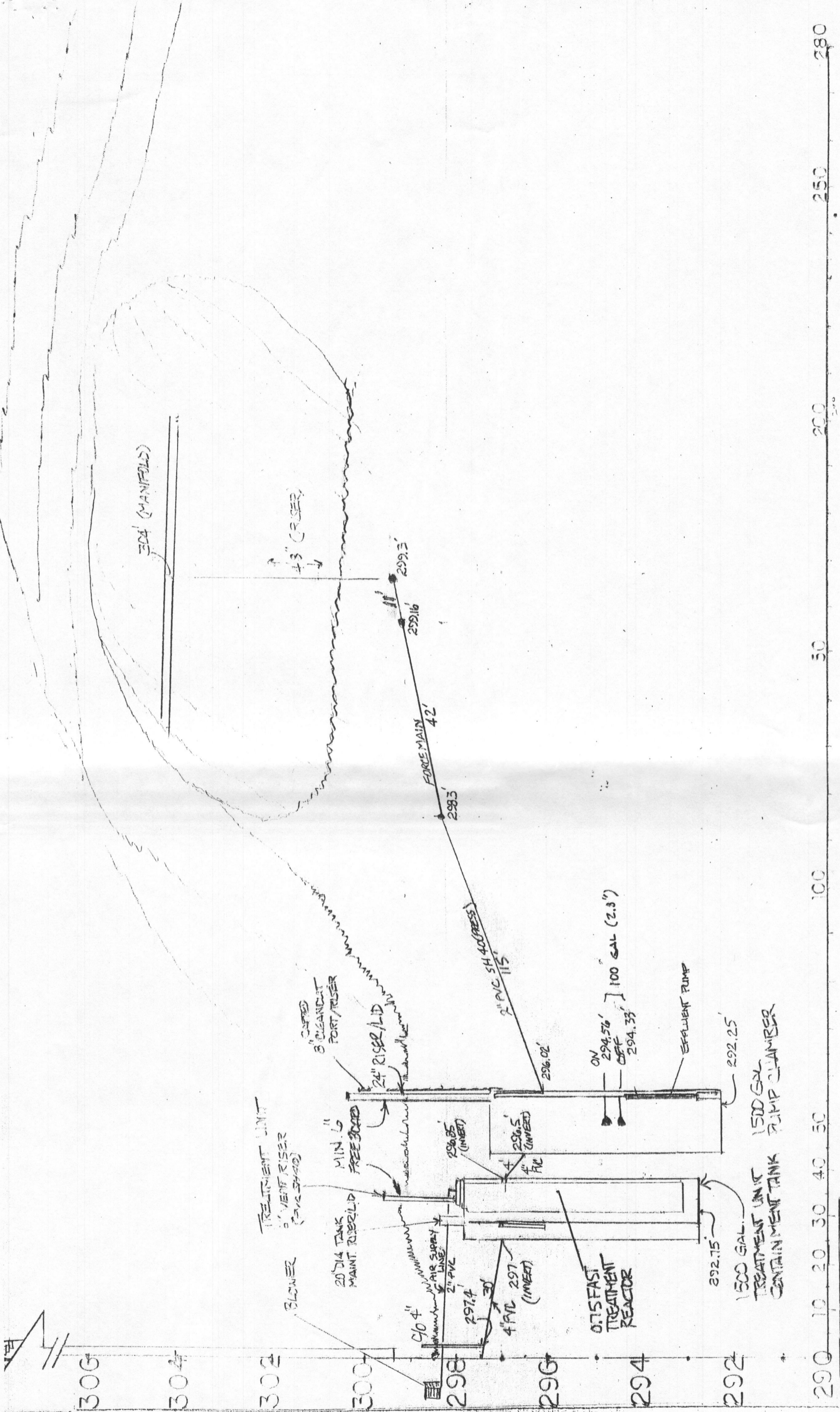
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TREVELLI PROPERTY
 Parcel 227/388
 7491 Mink Hollow Rd
 Highland, MD

Sheet Title:
 WASTEWATER
 SYSTEM
 PLAN

Sheet #
 WWT-1
 18 of 19 Sheets

7/30/67



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

CONSTRUCTION PROCEDURES

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 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 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 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 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:

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.

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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 fill material should be worked in this manner until the height of the fill reaches the elevation of the top of the absorption bed.

- 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 (ie., 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 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.

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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 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 mound to a depth of about 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 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
- 5.5.1 Relocate and extend the force main several feet above the ground surface.
 - 5.5.2 Place the approved sand fill material on the upslope edge(s) of the plowed area. Keep delivery trucks off the plowed area. Minimize traffic on the downslope side. Fill should be placed and spread immediately after plowing. Move the fill

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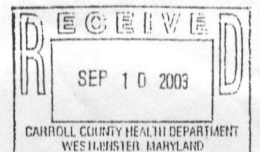
MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
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Robert L. Ehrlich, Jr.
Governor

Kendal P. Philbrick
Acting Secretary

Michael S. Steele
Lt. Governor

Memorandum



TO: Environmental Health Directors
THRU: Jay Prager, Chief, On-Site Systems Division
FROM: Barry Glotfelty, Regional Consultant, On-Site Systems Division
RE: Alternative Sand for Mounds
DATE: September 4, 2003

Contractors and some counties have experienced considerable difficulty in acquiring sand for use in sand mounds that consistently meets the specification from COMAR 26.04.02.05 Q (1) requiring an effective size of 0.25 - 0.5 mm, with a uniformity coefficient ≤ 3.5 . This has led us to explore whether sands with different qualities could be approved for use in Maryland mounds.

Recent research from the University of Wisconsin indicates that a sand with slightly different properties than those currently deemed suitable for use in Maryland also give acceptable performance in mounds. The State of Wisconsin's sand specification is included in the Wisconsin Mound Soil Absorption System: Siting, Design and Construction Manual, January 2000. The portions of the document that relate to sand specification are attached to this memo. The entire document, publication # 15-24, is available at the Small Scale Waste Management Project's website www.wisc.edu/sswmp/publist.html

Sand meeting the specification described in the Wisconsin manual can be accepted for use in Maryland mounds if all of the following conditions are met:

1. A recent sieve analysis should be included with the proposed sand indicating that the parameters of the Wisconsin specification are met including allowable percentages of particles less than 0.053 mm and greater than 2 mm (see figure 5).
2. The mound employing the sand must be classified as an alternative (non-conventional) system instead of a conventional mound. This is because the sand specification for use in a conventional mound is explicit in our regulation.
3. The design conditions included in the Wisconsin manual must be employed in the design of the mounds that use the alternative sand. These conditions include bed loading rates of 1.0 gpd/ft² or less, gravel beds less than 10 ft wide ensuring a linear loading rate of less than 10 gpd/ft., and effluent filters employed in the outlet of the second compartment of the two compartment septic tank used for pretreatment. Additionally, observation ports must be installed in the mound (see Maryland's 1993 Sand Mound Design and Construction Manual).

BG:je

Attachment

cc: J. James Dieter
Regional Consultants

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DATE: 6/8/07
scale: 1" =



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