


11745 TRAILS END LN

01934108

9/13/07

thomatc

Groundwater and Wastewater Services File Imaging Project

May 2007

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Paid #150 - 3/28/01 AP042997 RF

# CERTIFICATE OF COMPLETION/OPERATION PERMIT

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON ST., SUITE 211
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 4798A DATE: 2/23/01

TC: 019 171 19 ☒ L ☒ CRT

SERIAL Nº 18416

Name of Owner Raymond C. Mulligan Juris.:

Address of Property 11745 Trails End Ln

**Inspection Data:**

Tank Material PCC

Total Length of Drainfield 1,024

Number of Lines 16 lines @ 64'

Cover Depth 6" - 10"

Water Supply Source well

Distance to Water Source >100'+

Excavation Inspected 2/9/01

Tank(s) Inspected 2/9/01

Wash Line Inspected plumb to tank

High Water Alarm Inspected 2/23/01

See plan

PLOT

Design 2001, 1500ST, 1000DT, PI, 1,024 LPP CTR# Brad Russell

The undersigned has inspected the Septic Tank System described above, and certifies it has been

☒ installed or constructed ☐ altered or repaired

☒ in accordance with the permit issued ☐ as detailed in the plot above

and meets the provisions of 15A NCAC 18A. 1900, "Laws And Rules For Sewage Treatment and Disposal Systems" in effect on the date of issuance of the permit. This issuance of this

☐ Certificate of Completion ☒ Operation Permit

does not in any way guarantee that the system will operate properly or relieve any person now or hereafter owning, controlling, or using such system from any liability resulting from the failure of the system to operate properly. This document is issued subject to those restrictions and conditions shown on the permit(s) and the provisions of 15A NCAC 18A. 1990 in addition to those listed below under "COMMENTS." This document shall be null and void if any information contained in the application is untrue or if any additions are made to the property which would increase the requirements for said system.

**Notice:** Disturbance of the designated repair area may result in the suspension/revocation of this permit.

COMMENTS: Head pressure on designed not achieved on laterals. Engineer stated that the system only needed minimal pressure to achieved desired flow/each line appeared to have appr 12" of head. Septic System designed for a 4 bedroom residence.
Type IIIc 1½ HP pump

Philo S. Walker R.S.
Environmental Health Specialist

Mecklenburg County services are available without regard to ethnic origin, sex, or disability.

# INSTALLATION, CONSTRUCTION, ALTERATION, AND/OR REPAIR APPROVAL

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON ST., SUITE 211
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 4798A DATE: 2/2/01

TC: 919 171 19 L

SERIAL Nº 18591

Permission is hereby given to ✓ Install or Construct, _____ Alter or Repair the individual septic tank wastewater treatment system with subsurface, soil absorption, effluent discharge as specified herein at the described location. This permit is granted based upon the information supplied in the application dated 5/8/2000. All work shall be completed on or before 3/2/01, after which date this permit shall be null and void. The system shall meet all of the construction requirements of 15A NCAC 18A. 1900 which are in effect on the date of the granting of this permit. A Certificate of Completion or an Operation Permit must be obtained from the Mecklenburg County Health Department before any system can be covered up or placed into service. The issuance of this permit does not in any way guarantee that the system anticipated to be constructed will operate properly, or relieve any person now or hereafter owning, controlling or using such system from any liability resulting from the failure of the system to operate properly.

Install septic system in accordance w/ Approved plot plan design

PLOT OF SYSTEM

Liquid Capacity of Septic Tank 1500 gallons

Liquid Capacity of Dosing Tank 1000 gallons

Tank Construction PCC

Trench Depth _____

Absorption and/or Nitrification Lines:

Trench Width See Plot Plan design feet

Trench Walls Scored and Porous Yes

Total Line Length _____ feet

Number of Lines _____

Depth of Stone _____ inches

Distance from House >5' feet

Distance from Property Line 10' feet

Distance from Well >100' feet
50' Min

NOTICE: This system shall not be installed while soils are in a wet condition.

NAME OF OWNER Raymond C. Mulligan

LOCATION OF PROPERTY 11745 Trails End LN

Comments: Install septic system in accordance w/ Approved plan design.

Phil A. Walker R.S.
Environmental Health Specialist

WHITE - HEALTH DEPARTMENT's COPY • CANARY - E.H.S. COPY • PINK - OWNER OR AGENT's COPY


GCI
GEO-ENVIRONMENTAL
CONSULTANTS

GCI
GEO-ENVIRONMENTAL CONSULTANTS

*Charlotte, NC*
*Lexington, KY*
*Pittsburgh, PA*

# RESIDENTIAL LOW PRESSURE PIPE SYSTEM FORSUBSURFACE WASTEWATER DISPOSAL 11745 TRAILSEND ROAD HUNTERSVILLE, NORTH CAROLINA

**PREPARED FOR**
**RAYMOND C. AND JENNY MULLIGAN**
**7218 GLENBROOK LANE**
**CHARLOTTE, NC 28227**

**PREPARED BY**
**GEO-ENVIRONMENTAL CONSULTS**
**A DIVISION OF SHIELD LENVIRONMENTAL ASSOCIATES, INC.**
**11704 REAMES ROAD**
**CHARLOTTE, NC 28269**

**GCI PROJECT NO. 1002066-01**

**JULY 2000**

GCI
GEO-ENVIRONMENTAL CONSULTANTS

*Charlotte, NC*
*Lexington, KY*
*Pittsburgh, PA*

July 21, 2000

Mr. Kelly Randall
Environmental Health Division
700 North Tryon Street, Suite 211
Charlotte, NC 28202

RE: Residential Low Pressure Pipe System
745 Trailsend Road
Huntersville, North Carolina
GCI Project No. 1002066-01

Dear Mr. Randall:

Geo-Environmental Consultants (GCI), a division of Shield Environmental Associates, Inc. is pleased to present the attached permit application and design package for the above referenced project. This application and design report is submitted on behalf of Raymond C. and Jenny Mulligan for the purpose of permitting and installing a Low Pressure Pipe (LPP) wastewater treatment system.

Since the original soil classification was determined to be Unsuitable by the Mecklenburg County soil scientist an alternative system was designed in accordance with the Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A, Section .1957. This design report will serve as official notice that the alternative LPP system has been designed to meet the requirements of Section .1948 of 15A NCAC 18A.

At the time of our site visit the drainage area for the proposed LPP system was determined to be gently sloping and is anticipated to function adequately. Due to the length of the pipes and the relatively flat ground surface it was determined that layout of the drain field by a registered surveyor will be required. The homeowner has been made aware of this design requirement and this survey will be scheduled concurrently with the submission of this design report. As part of the site layout the location of the system components and drinking water well will also be clearly identified.

Due to the marginal nature of the on-site soils for conventional system, GCI is also recommending that the trench excavations also be inspected by our geotechnical engineer prior to the placement of gravel and soil backfill. During this on-site evaluation the GCI engineer may make minor relocations of the exterior trenches and/or scratching of the sidewalls of the trenches to avoid smearing of the in-place soils. The purpose of the on-site evaluation will be to maximize the available treatment capacity of the soils by ensuring a quality installation.

Limitations:

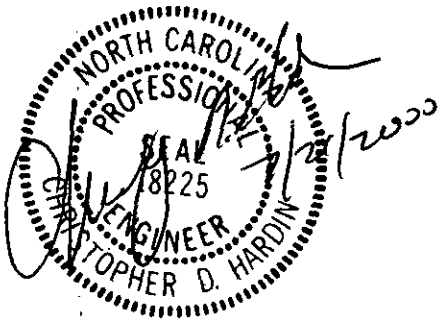
This permit application and design report has been prepared for Raymond C. and Jenny Mulligan and the Mecklenburg County Health Department for the specific application to the referenced project site. These services have been performed in accordance with generally accepted environmental and engineering practices. No warranty, expressed or implied is made. Although we cannot be responsible for the accuracy of the data provided to us by others, we have no reason to suspect that any of the information provided is inaccurate unless it has been otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visit.

If you have any questions concerning this submittal, please contact us at (704) 596-8788.

Sincerely,

**GEO-ENVIRONMENTAL CONSULTANTS**
**A Division of Shield Environmental Associates, Inc.**

Christopher D. Hardin, P.E.
Principal Engineer




Attachment

cc: Mr. Raymond C. Mulligan

Appendices

Appendix A - Design Specifications and Computations
Appendix B - System Layout and Drawings
Appendix C - Mecklenburg County Site Evaluation Form and Subsurface Wastewater System Review Checklist
Appendix D - System Equipment Information

GCI GEO-ENVIRONMENTAL CONSULTANTS

## BACKGROUND

The property that will be utilized for the residential LPP septic system is planned for a single family, 4-bedroom residence.

Mecklenburg County Soil Scientist, Mr. William Marlin, performed a site investigation on May 31, 2000. Mr. Marlin classified portions of the site as Provisionally Suitable with an LTAR of 0.3 gpd/ft$^2$ and other portions of the site as Unsuitable pending the design of an alternative system in accordance with Section .1957 of the Laws and Rules for Sewage Treatment and Disposal (15A NCAC 18A). The Soil/Site Evaluation prepared by the Mecklenburg County Health Division (MCHD) is included in Appendix C to this design report.

The residence will be served by an on-site drinking water well that has already been installed and is located approximately 50 feet away from the limits of the proposed residence. This drinking well is located outside the limits and up slope of the proposed septic drain field area and the location shown on the attached figures will be verified with an survey prior to system installation.

The location of the nitrification field is on a relatively flat portion of the site. The area at the time of the site evaluation was cleared of timber, but the near surface soils had little or no disturbance at the time this design was prepared. The trees were cut and removed, however, no stumps or existing in-place soils were removed. The homeowner has been informed that care should be taken to ensure minimum land disturbance in the vicinity of the proposed septic drain field. The location of the proposed septic drain field and the designated repair area is shown on the attached Figure 1.

## APPLICATION INFORMATION

1) Application for Improvement Permit has been submitted to Mecklenburg County Health Department by the property owner, Mr. Raymond C. Mulligan.
2) Property is shown on attached portion of development survey. The MCHD file number is 4798A.
3) Owner: Mr. and Mrs. Raymond C. Mulligan
7218 Glenbrook Lane
Charlotte, North Carolina 28269
(704) 379-9110 (Office)
(704) 597-5110 (Fax)

Engineer: Mr. Christopher D. Hardin, P.E.
Geo-Environmental Consultants (GCI)
A Division of Shield Environmental Associates, Inc.
11704 Reames Road
Charlotte, NC 29269
(704) 596-8788 (Office)
(704) 596-8770 (Fax)

4) Project described herein is a new project.
5) Water supply for development is provided by an on-site residential well shown on the attached Figure 1.
6) Facility to be served by the proposed system is a 4-bedroom single family residence.
7) Wastewater system components are described herein.
8) With most systems, MCHD requires that the house and nitrification lines be located and marked prior to their final approval. GCI agrees with this guideline and will require a layout by a surveyor immediately after design submittal to the MCHD.

## LOCATION

The property is located at 11745 Trailsend Road off Asbury Church Road in Huntersville, North Carolina.

## REFERENCES

1) Design and Installation of Low Pressure Pipe Waste Treatment System by: Craig Cogger, Bobby L. Carlile, Dennis Osborne, Ed Holland; published by UNC Sea Grant College Pub. UNC-SG-82-03, May 1982.
2) Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A, Section .1900, Department of Environment Health and Natural Resources, August 1, 1998

## PLANS AND SPECIFICATIONS FOR SPECIFIC SYSTEM COMPONENTS

### Septic Tank

1) The septic tank receives wastewater directly from the house.
2) A septic tank shall be in accordance with Section .1954 of 15A NCAC 18A and should have appropriate liquid seals, structurally soundness, and should not be subject to excessive corrosion or decay.
3) The septic tank is designed for a 1,000 gallon capacity, a liquid storage depth of 48 inches and a total depth of 53 inches. The septic tank must be a two-compartment design for maximum solids retention. The inlet compartment of a two-compartment tank shall hold between two-thirds and three-fourths of the total tank capacity.
4) Effluent from the two-compartment septic tank is designed for gravity flow through a four-inch solid wall PVC pipe to the pumping tank.
5) Both the septic tank and pumping tank must be provided with above ground concrete or masonry manhole risers to provide easy access for clean-out and pump service.
6) When prefabricated concrete tanks or tanks of other material are used, they shall be constructed in accordance with the plans that have been approved by the State and shall comply with all requirements of Section .1953 of 15A NCAC 18A.
7) On the outlet tee of the septic tank a filter should be installed. This filter should be equivalent to a Zabel Model A1800 and have access from the top ports to allow the required preventative maintenance. An access port over the filter should be installed as shown. A product sheet from Zabel Environmental Technology in provided in the Appendix.

## Pumping Tank

1) The pumping tank is sized for 1,000 gallon capacity and should have a minimum liquid storage depth of 48 inches and a total depth of 53 inches. The pumping tank is designed as a single compartment design to provide the required dosing interval and depth for the low pressure piping system. The 1,000 gallon pumping tank will have an access manhole extending at least 6 inches above finished grade that will allow access to the pumping system without removing the entire tank lid.
2) Pump and control circuits shall be provided with manual circuit disconnects within a watertight, corrosion-resistant, outside enclosure (NEMA 4X or equivalent) adjacent to the pump tank, securely mounted at least 12 inches above finished grade. The pump(s) shall be designed for testing purposes to allow a manual over ride of the automatic system without the use of special tools or entrance into the tank. Electrical conductors shall be conveyed to the disconnect enclosure through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes provided inside the tank. Wire grips, duct seal or other suitable material shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure. To ensure adequate compliance with local electrical codes the pump system electrical components should be approved by a registered North Carolina Master Electrician and the pumping manufacturer's local representative.
3) The pumping tank shall have a properly functioning high-water alarm. The alarm circuit shall be supplied ahead of any pump overload and short circuit protective devices. The alarm shall be audible and visible by system users and included in the pump and control enclosure (Simplex or Duplex Control Panel).
4) Float switch for the high water alarm shall be set no more than 3 inches above the high water level of pump cycle.
5) Pump floats should be set so that the level of water at the end of a pump cycle is above the top of the pump.
6) Float switch tie downs shall be made of corrosion resistant material, no tape or metal hose clamps.
7) Pump discharge piping shall be 2 inch diameter, Schedule 40 PVC and shall have a check valve that is designed and acceptable for use on residential wastewater applications.
8) Anti-siphon hole (three-sixteenth inch) is required between the pump and the check valve.
9) Watertight testing will be required on two piece pump tanks.

## Pipe and Fittings

1) All pipes and fittings should be made of PVC plastic.
2) All joints must be sealed with an appropriate PVC-solvent cement. The yard piping and supply manifold(s) from the pumping tank to the Low Pressure Pipe distribution field should be 2-inch Schedule 40 PVC.
3) There should be a threaded PVC union above the pump to allow easy removal or replacement. The pump should be mounted and secured in accordance with the manufacturer's recommendations to minimize stress on the piping system or other system components.

4) Lateral lines are designed to be made of 1- 1/4-inch PR160 PVC. Holes in the laterals should be drilled at the site at the spacing and locations indicated in the Lateral Lines section of this report.

5) A globe valve for final pressure adjustment should be installed in the supply manifold inside the pumping tank.

6) The end of each lateral line is equipped with a capped "turn-up" that provides above ground access for clean-out or back-flushing. The system is designed using 45-degree elbows rather than 90-degree elbows to allow clean out using mechanical methods if necessary.

**Pump, Float Controls and Alarm System**

1) The system is designed with a septic-tank effluent pump or a corrosion resistant submersible sump pump that will not be corroded by sewage during the design life of the system. The system pump should be a Myers, ME50 pump that is specially designated for low pressure piping or sand mound systems. Equivalent pumps are acceptable but they should be able to provide a minimum of 20 feet of head pressure at 30 gpm. Applicable product sheets from the F.E. Myers and Hughes Supply of Charlotte, North Carolina has been provided as a reference in the attached Appendix.

2) The controls for the pumping system include a float level and time system control for turning the pump on and off and a high water alarm to signal pump and/or system malfunctions.

3) The pump control should be sealed against the entry of corrosive and explosive gases from the effluent and should have a weathertight NEMA 4X (National Electrical Manufacturing Association) approval. The pump control installation should be approved by a North Carolina registered Master Electrician with experience in the installation of septic pumping control systems.

4) The system is designed with mechanical flood switches that are activated by a sealed float that contains a metal ball in contact with power leads. See attached product sheet from F. E. Myers and Hughes Supply of Charlotte, North Carolina.

5) In addition to the on and off control floats, there must be a separate float control for the high-water alarm. This may be a sealed, mercury-float switch mounted several inches above the on float. The high-water alarm should be located within the house and consist of a light bulb and/or audible signal mounted over a sign marked "wastewater system alarm." It should be on a separate electrical circuit from the pump power line, and be equipped with a test switch. The alarm is activated if the water level in the pumping tank rises above the "pump-on" float control. The tank provides at least one day or more of excess storage capacity (depending on water use in the home) during which time the system must be repaired.

**Home Water-Saving Devices**

Any home with an LPP system must be equipped with low-flow showerheads (three gallons per minute) and low-flush commodes (3 ½ gallons or less per flush) in order to minimize the hydraulic load on the system. Those devices are a simple, low-cost way of reducing water consumption with no inconvenience to the homeowner. The homeowner has been informed of the requirement for the use of water saving devices as a necessary design component of this wastewater disposal system.

## CONSTRUCTION INSTALLATION

### Site Preparation

1) One of the most important concerns for an LPP system is to protect the site from soil disturbance by heavy equipment. It is GCI's understanding that the homeowner is aware of the potential negative impact of construction damage and will make provision to protect the proposed septic application area during the house construction.
2) As soon as the absorption area has been designated, it should be flagged, roped off and "quarantined" from construction traffic. No site preparation or LPP construction work should occur if the soil has visual evidence of surface saturation and/or ponding of water.
3) As of the writing of this design report the absorption area has been identified and the area has been cleared of brush and trees. Our preliminary site evaluation indicated that the larger trees were cut off above ground level to avoid creating depressions and damaging the soil-pore network.
4) The site currently has adequate drainage, but installation of the system will required provisions to be made for intercepting or diverting surface water away from the absorption area.
5) Since the area has already been cleared, after the design report has been submitted to MCHD, the location of the lateral lines and supply manifold should be accurately staked out according to design specifications. Each lateral line must be laid out along a level contour using a transit. It is GCI's understanding that the MCHD will review the system layout immediately prior to plan approval.

### Tank Installation

1) The two-compartment septic tank should be installed on firm soils at the location shown on Figure 1. After the tank has been installed it should be leveled and backfill should be installed around the tank using low ground pressure tampers to minimize the potential for damage to the tank.
2) The pumping tank should be installed near the septic tank using similar procedures to those used for the installation of the septic tank and at the locations shown on Figure 1.
3) The tanks should then be connected with the required length of solid wall, four-inch, Schedule 40, PVC pipe.

### Supply Manifold

1) The supply manifolds are designed to convey the system effluent from the pumping tank to the distribution laterals.
2) The manifolds are designed to join each lateral through a short riser pipe connecting a reducing tee on the manifold to a 1-1/4 inch elbow or tee on the lateral. This assembly design places each lateral pipe about six inches higher than the supply manifold and helps prevent the back-flow of effluent from a higher lateral to a lower lateral. The piping system installation should include the use of a 2" x 2" x 1 1/4" tee rather than "bushing down" when connecting laterals to the manifold.

3) After the supply manifolds have been placed in the trench and lateral lines connected, it should be backfilled with native soil and tamp tightly using hand tamper within 8-inches of the pipe and low ground pressure mechanical tamping equipment to minimize the potential for damaging the piping. The supply-manifold trench should not be backfilled with gravel or other granular non-native material, or the trench may become a conduit for effluent from the laterals.

**Lateral Lines**

1) Laterals will be placed at 5 foot minimum separation as required by 15A NCAC 18A.
2) The depth of the lateral trenches should be uniform from the manifold to the end of the lateral. In no case should the trench bottom be allowed to slope away from the manifold.
3) Small earthen dams are placed at the beginning of each lateral trench to help maintain uniform distribution of effluent along each trench.
4) Lateral trench bottoms are designed to be lined with three to six inches of gravel.
5) The 1 1/4-inch PVC pipes should be laid out and cut to proper lengths for the lateral lines. Holes are to be drilled (in a straight line) facing upwards (except for a hole 1/3 of the way from beginning and end of each line) after the laterals have been cut to proper length.
6) Holes should be drilled through only one side (top) of the pipe.
7) Sleeve laterals in 4-inch diameter perforated corrugated pipe. The corrugated pipe should have three rows of holes, each hole between 1/2" and 3/4" in diameter and spaced longitudinally approximately 4-inches on centers. The rows of holes should be equally spaced 120° on centers around the periphery, or three rows may be located in the lower portion of the pipe, the outside rows being approximately on 120° centers.
8) A short turn-up with a capped end should be installed at the end of each lateral. The capped end should be flush with or above the final grade. The system is designed using two 45 degree bends for constructing cleanouts.
9) Rock used in the nitrification trenches should be clean, washed gravel or crushed stone and graded or sized between 3/8 to 1 inch. The rock shall be placed a minimum of 12-inches deep with at least 6-inches between the pipe and the trench bottom and 2-inches over the pipe, and distributed uniformly across the trench bottom and over the pipe.
10) Use geotextile fabric over the trench at the gravel-backfill interface to minimize the migration of fine particle materials into the trench.

**Pump and Controls**

1) The pump should be placed on two concrete blocks set next to each other on the bottom of the tank to minimize the pumping of solid particles that can clog the LPP system.
2) A piece of nylon rope or other non-corrodible material should be attached to the pump and to the outlet pipe for lifting the pump in and out of the chamber.
3) The lower level control or "pump-off" must be positioned above the pump, so that the pump remains submerged at all time as shown in the figures in the Appendix.
4) The pump outlet pipe should be connected to the supply manifold with a threaded PVC union to allow quick removal.

5) A 1/4-inch siphon breaker hole should be drilled in the bottom of the supply line before it leaves the pump tank. This hole is designed to break any vacuum in the system and minimize the inadvertent siphoning of effluent out of the tank.

**Electrical Connections**

1) The pump and high-water alarm must be placed on separate electrical circuits.
2) All electrical connections must be made outside the pumping tank. Power cords from the pump and controls should be plugged into a weathertight NEMA 4X approved outdoor ground fault receptacle mounted outside of the pumping tank.
3) Wiring between the pumping tank and the house should meet state and local code requirements and the installation of the controls should be approved by a North Carolina registered Master Electrician.

**PROPER OPERATION CHECK**

1) After the piping and electrical connections have been installed and connected, the system should be checked for proper operation. With electrical power turned off, fill the pumping tank with water until the liquid rises to the level of the high-water alarm float.
2) Turn on the electrical power after the liquid has reached the high level alarm level. The alarm light should go on in the house, and the pump should start operating. The alarm light should go off when the liquid level falls below the high-water float. The pump should turn off when the liquid reaches the lowest float control. Be sure the pump is still completely submerged. This testing process should be repeated at least two times to ensure that a complete cycle is possible for the system.

**PRESSURE HEAD ADJUSTMENT**

1) The pressure head must be adjusted to match that specified in the design. The pressure head is measured as the height liquid will rise above the turn-up elbow when the pump is running. To adjust the head:
   - Glue a four-foot length of pipe (preferably clear) to a threaded adapter that will screw onto the turn-up adapters at the end of each lateral.
   - Replace the turn-up cap with the pipe and adapter
   - Turn the power on to allow liquid to rise in the pipe
   - Adjust the gate or globe valve in the pumping tank until the effluent reaches the desired height in the pipe. Remember to include the distance below the ground surface to the lateral line when measuring the height.

**FINAL LANDSCAPING**

1) After the LLP system is installed, the following should be checked to ensure that the system will not be overloaded with excess rainwater and runoff:
   - The distribution field should be shaped to shed rainwater and have no areas with ponding water.
   - Grassy swales or ditches for diverting surface water should be properly installed and seeded.

- Gutter and downspout drains should be directed away from the system.

2) Finally, the entire area should be planted with grass in order to prevent erosion. The soil should be properly tilled to a shallow depth, limed (if necessary) and fertilized before planting. After applying an appropriate grass seed, the area should be mulched with straw or other suitable material.

## QUALITY ASSURANCE REQUIREMENTS

The LPP system must be installed by a qualified, contractor that is on the Mecklenburg County list of competent contractors. The MCHD requires and GCI also recommends that the construction and installation of the LPP system be spot checked by an independent design engineer recognized by Mecklenburg County to have experience in the design of LPP systems. Critical stages of the installation that should be checked are as follows:

1. System layout by a registered surveyor
2. Septic and pump tank installation prior to backfilling
3. Manifold and lateral installation prior to backfilling.
4. Final landscaping, pump operation and pressure head check.

It is important to note that if on-site quality assurance observations are not provided by GCI, then the homeowner and/or installation contractor assumes responsibility and/or liability for proper system installation and operation.

The system design is based on a maximum waste flow of 480 gallons per day. Homeowners should pay particular attention to the section titled Owner Care Requirements for ways to minimize the burden on and malfunction of the system components.

## MAINTENANCE

1) Any person owning or controlling the property upon which a ground absorption sewage treatment and disposal system is installed will be responsible for the following items regarding the maintenance of the system:
   - The ground absorption sewage treatment and disposal systems should be maintained at all times to prevent seepage or discharge of sewage or effluent to the surface of the ground or to surface waters.
   - The ground absorption sewage treatment and disposal systems should be checked and the contents of the septic tank removed periodically to ensure proper operation of the system.

2) A contract shall be executed between the system owner and a management entity prior to the issuance of an Operation Permit for a system required to be maintained by a public or private management entity. The contract should include the specific requirements for maintenance and operation, responsibilities of the owner and system operator, provisions that the contract will be in effect for as long as the system is in use, and other requirements for the continued proper performance of the system. It should also be a condition of the Operation Permit that subsequent owners of the system execute such a contract.

## OPERATION AND MAINTENANCE PROCEDURE

The system is classified as Type IV. The Regulations require that the system be operated by a person certified by the N.C. Department of Environmental Health to operate this type of system.

Operating, Maintenance and Inspection procedures shall include but not be limited to the following:

- Minimum inspection/maintenance frequency shall be 2 times per year, with reporting frequency every 6 months to the local Health Department.
- Septic system should be pumped every 4 years or when solids accumulate to 1/3 the volume of the tank.
- Two times per year clean and inspect the filter. When washing the filter, debris must be sprayed directly back into the septic tank and not onto the lawn.
- The LPP system should be observed by the regulatory agency one, three, six and nine months after initial installation, and then every 3 years thereafter. An inspection report should be completed and filed with the MCHD each time the system is checked.
- The laterals shall be pressure flushed annually with clean water.
- Pressure head for laterals should be checked and adjusted one month after installation and annually thereafter.
- All piping, fittings, turn-ups and valve boxes shall be checked annually for damage and/or proper operation and corrections made immediately.
- The property should be inspected to ensure surface water is deflected away from the fields and tank. Any ponding of surface water should be corrected.
- Grasses should be mowed and maintained and any erosion should be corrected promptly in the vicinity of the nitrification drain field and system components.
- The nitrification drain field should be checked twice a year for leaks, blowouts or malfunction, indications of damp or mushy areas compared to surrounding area or evidence of noticeable odor of sewage. Repairs shall be made immediately.
- The pump electrical should be checked to insure tight, clean connections with no corrosion and proper operation.
- Pump switches shall be checked for free operation and proper level set.
- Pump draw down depth and delivery rate shall be checked twice a year.
- Check septic tank and pump tank for evidence of damage or leakage. Check the quality of effluent including grease and sludge accumulation.

The system operator in conjunction with the local Health Department should establish an operation and maintenance program and procedure based on experience obtained from similar installations.

## OWNER CARE REQUIREMENTS

Most low pressure pipe systems require adequate effort on the part of the owner to operate and maintain. Even though the effort is typically minimal, the system must be maintained properly to provide reliable operation and minimize repair costs. The following are suggestions for the home owner to minimize the burden on a low pressure pipe system.

1) Garbage disposals should not be used for on-site low pressure systems. The ground garbage adds large amounts of solids to a septic tank, causing sludge to build up very quickly.
2) Grease, cooking oils and coffee grounds should never be put in the sinks and other plumbing components that drain to the septic tank.
3) Items such as disposable diapers, cigarettes, facial tissues and other solid or paper wastes should not be flushed into the on-site system.
4) Used motor oil and other such oily liquids should not be put into a septic tank and will be considered an environmental impact if discovered at a later date.
5) Using less water can reduce the amount of water flowing to the treatment and disposal field and will preserve the design life of the system.
6) Water-saving fixtures and devices should be installed on sinks, toilets and showers to reduce the rate and volume of water that flows from the fixtures.
7) Dishwashers and washing machines should only be run with full loads.
8) Leaky faucets and toilets can add large volumes of water to the daily flow of liquid into the on-site system. Leaks within the plumbing and water distribution system should be repaired as soon as possible to save water and minimize the total volume of liquid to the treatment and disposal field.
9) Roof drains, basement sump pumps, foundation drains, and other such drains should not empty into the on-site system. These drains should be directed to another part of the lot away from the treatment and nitrification drain field.

## DESIGN LIMITATIONS

1) The site soil evaluation and design parameters for this project were performed by representatives of the MCHD. Although we cannot be responsible for the accuracy of the data provided to us by others, we have no reason to suspect that any of the information provided is inaccurate unless it has been otherwise noted in this design report.

2) This design does not address potential malfunction due to improper installation, operation and/or maintenance.

3) As indicated above, effective operation of the septic system requires adequate effort on the part of the owner. The system design provides general care requirements but does not provide detailed troubleshooting guidelines. Additional septic system troubleshooting guidelines can be provided by GCI if requested.

4) These design services have been performed in accordance with generally accepted engineering practices.

# APPENDICES

# APPENDIX A

## Design Specifications and Computations

**DESIGN SPECIFICATIONS**
**Low Pressure Piping System**
**11745 Trailsend Drive**
**Huntersville, NC**

| | |
|---|---|
| Daily waste flow | 480 gal |
| Septic tank size | ~~1000 gal~~ 1500 |
| Pumping tank size | 1000 gal |
| Effluent loading rate | 0.125 gal/ft$^2$/day |
| Absorption area | 2 areas, 40 ft. by 64 ft. |
| Total length of laterals | 1,024 ft. |
| Lateral diameter | 1 1/4 in dia. PVC |
| Lateral configuration | 16 x 64 ft lines, 2 sections |
| Supply line length | 135 ft |
| Supply line diameter | 2 in dia. Sch 40 PVC |
| Manifold placement | Side Inlet |
| Hole size | 5/32 in |
| Hole spacing | Varies, see Table 1 |
| Number of holes | Varies, see Table 1 |
| Flow per hole | Varies, see Table 1 |
| Maximum pump design flow | 50 gpm at 40 feet of head |
| Elevation head | 10 ft |
| Friction head | 1.33 ft |
| Pressure head | 3.3t |
| Total head | 15.6 ft |
| Minumum pump requirements | 30 gpm at 20 feet of head |
| Storage volume in laterals | 461 gal |
| Storage volume in supply line | 22 gal |
| Total storage volume | 483 gal |
| Dosing volume | 200 gal |
| Dosing depth* | 10 in |
| Pump run per dose | 2 minutes, 30 seconds |
| Check valve | Yes |
| Siphon break hole | Yes |

* Double check dosing depth against pump tank dimensions

W:\REPORTS\2000\1002066-01\MULLLPP1.REP

**RESIDENTIAL LOW PRESSURE PIPE SYSTEM**

**Client: Raymond and Jenny Mulligan**

**Location: 11745 Trailsend Road**

**Date: July 21, 2000**

| Lateral | Length (FT) | Invert Elevation of Lateral Head (FT) | Pressure Head (FT) | Flow Rate* Per 1/8 inch Hole (GPM) | Hole Spacing (FT) | # of Holes Per Line | Flow/Line (GPM) |
|---|---|---|---|---|---|---|---|
| A1 | 64 | 678.5 | 2.5 | 0.32 | 3 | 16 | 5.1 |
| A2 | 64 | 678.2 | 2.8 | 0.32 | 3 | 16 | 5.1 |
| A3 | 64 | 677.9 | 3.1 | 0.37 | 3 | 16 | 5.9 |
| A4 | 64 | 677.6 | 3.4 | 0.37 | 3 | 16 | 5.9 |
| A5 | 64 | 677.4 | 3.6 | 0.37 | 3 | 16 | 5.9 |
| A6 | 64 | 677.1 | 3.9 | 0.37 | 3 | 16 | 5.9 |
| A7 | 64 | 676.8 | 4.2 | 0.41 | 3 | 16 | 6.6 |
| A8 | 64 | 676.5 | 4.5 | 0.41 | 3 | 16 | 6.6 |
| | | | | | | ***Zone A Total*** | ***47.0*** |
| B1 | 64 | 678.5 | 2.5 | 0.32 | 3 | 16 | 5.1 |
| B2 | 64 | 678.2 | 2.8 | 0.32 | 3 | 16 | 5.1 |
| B3 | 64 | 677.9 | 3.1 | 0.37 | 3 | 16 | 5.9 |
| B4 | 64 | 677.6 | 3.4 | 0.37 | 3 | 16 | 5.9 |
| B5 | 64 | 677.4 | 3.6 | 0.37 | 3 | 16 | 5.9 |
| B6 | 64 | 677.1 | 3.9 | 0.37 | 3 | 16 | 5.9 |
| B7 | 64 | 676.8 | 4.2 | 0.41 | 3 | 16 | 6.6 |
| B8 | 64 | 676.5 | 4.5 | 0.41 | 3 | 16 | 6.6 |
| | | | | | | ***Zone B Total*** | ***47.0*** |
| | | | | | | ***Total*** | 94.1 |

Note: 1) System elevations are based on a spot elevation of 680.2 provided on topographic survey from client.

2) Laterals should be layed out by a surveyor and should be parallel to the change in slope and follow the topographic coutours lines.

3) Pressure/Flow computations are based Design and Installation of LPP Systems, Chap. 7, May 1982

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY CDH DATE 7/14/2002

CHKD. BY _____ DATE _____

| | | | |
|---|---|---|---|
| CLIENT | Ray Mulligan | SHEET | 1 OF 2 |
| PROJECT | Residential Septic System Design | PROJECT NO. | 1002066 |
| SUBJECT | Absorption Area Size and Layout | | |

# I. Size of Absorption Area

## A. System Flow

4 BR x 120 gal = 480 gal/day

## B. Loading Rate

Mech Co Soil Site Evaluation
File # 79BA 5/31/2000

Min. LTAR = 0.125 gal/ft²

Reduce by 25% to account for non-homogeneous soils.

Design LTAR = 0.125 (0.75)

Design LTAR = 0.09375 gal/ft²

Note: GCI Engineer drilled 2 hand auger to confirm soil classification. Mech Co. Min LTAR acceptable. Interbedded Silty Sand Seams will provide additional infiltration area. 25% Reduction is Conservative.

## C. Length of Distribution Trenches

System Area = 480 gal/day / 0.09375 gal/ft²

Area = 5,120 ft²

Required Line Length

Length = 5120 / 5 ft C/C

Length = 1024 ft

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY CDH DATE 7/14/2000

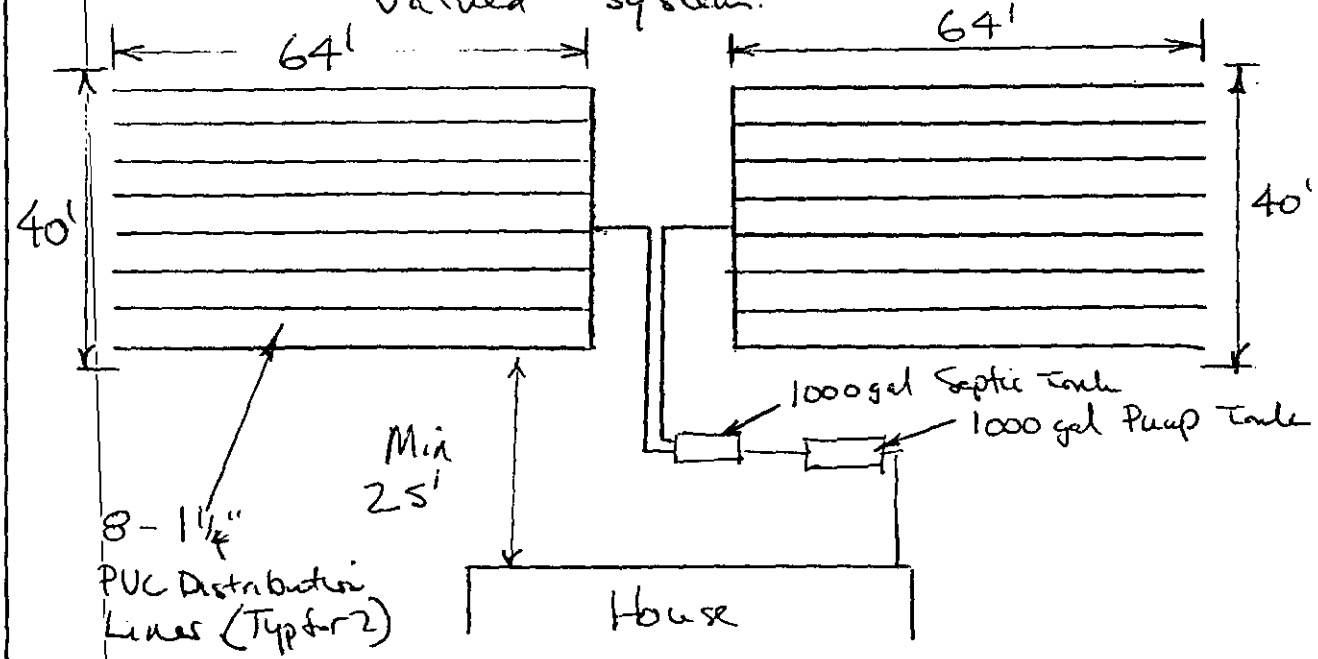
CHKD. BY _____ DATE _____

| | | | |
|---|---|---|---|
| CLIENT | Ray Mulligan Residence | SHEET | 2 OF 2 |
| PROJECT | Residential Septic System Design | PROJECT NO. | 1002066 |
| SUBJECT | Absorption Area Size and Layout | | |

I D. Schematic Layout & Sizing

Use 16 Lines @ 64 ft long

Divide into two equal sub area with parallel piped & separate valved system.




Total Absorption Area

$2 \times 64 \times 40 = 5{,}120$ ft²

OK

II Size of Septic & Pumping Tanks

From T15A:18A, Section 0.1952

$Vol = 2Q$ $\quad Q = 480$ gal/day

$Vol = 2(480)$

$Vol = 980$ gal

Use 1,000gal Septic Tank

1,000gal pumping Tank

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY CDH DATE 7/19/2000

CHKD. BY _____ DATE _____

| | | | |
|---|---|---|---|
| CLIENT | Ray & Jenny Mulligan | SHEET | 1 OF 2 |
| PROJECT | Residential Septic System Design | PROJECT NO. | 1002066 |
| SUBJECT | ~~Absorption~~ Dosing Volume / Pump Interval | | |

# II Dosing Volume / Pump Interval

From Design & Installation of LPP Systems p 12

A. $V_{dose} = V_{supply} + 5(V_{laterals})$

$V_{supply} = (d_1 + d_2)\left(\frac{75+60}{100}\right)(16.2)(16.2)$ ← 2 in Sch 40 Table 4 p 12

$V_{supply} = 21.9$ gal

$V_{Lateral} = (16 \times 64')/100\,(9.0)$ 1 1/2 in 160 psi Table 4 p12

$V_{dose} = (21.9 \text{ gal}) + 5(92.16)$ (Use 461; 4 x 22)

$V_{dose} = 482.7$ gals → 483 Use 500 gal/day Use 500 gal/dose

Note: Dosing 2 to 3 times per day provide adequate rest interval.

B. Dosing Depth

Tank Size 1000 gal

50 inches deep
88 inches long
53 inches wide
} Autry's Tanks

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY CDT DATE 7/15/20

CHKD. BY _____ DATE _____

| | | | |
|---|---|---|---|
| CLIENT | Ray & Jenny Mulligan | SHEET | 2 OF 2 |
| PROJECT | Residential Septic Design | PROJECT NO. | 1002066 |
| SUBJECT | Dosing Volume / Pump Interval | | |

II. B (cont)

Dosing Depth = $\frac{V_{dose}}{V_{tank}}$ X Liquid depth

2.5 dose/day

Use 4ft

$(200/1000) \times 4\text{ ft}$

Dosing Depth = 0.8 ft

= 9.6 inches

Use. Depth 10 inches.

To provide drawdown of 200 gal.

Estimated Pump Run

200 gal / 80 gpm > 2.5 Minutes

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY CDA DATE 2/17/2000

CHKD. BY _____ DATE _____

| | | | |
|---|---|---|---|
| CLIENT | Ray & Jenny Mulligan | SHEET | 21 OF 2 |
| PROJECT | Residential Septic System Design | PROJECT NO. | 1002066 |
| SUBJECT | Pump Selection | | |

## III Pump Selection

### A. Head Loss

Assume Distance to System Header

$d_1$ = 75 ft. @ 2 in ϕ

*Computed Length of Header from Width of System.

$d_2$ = 60 ft @ 2 in ϕ

$d_t = d_1 + d_2$

$d_t$ = 135 ft

Use $d_t$ = 150 ft

Note: Laterals are down hill / gravity from house discharge point.

From Design of LPP W.T Systems. May 1982

Friction Head = $h_f$

$h_f$ = 1.2 (Pipe Friction ($h_p$)) Assume 20 gpm

$h_p = (150'/100) \times 0.74$ ← See Table 3

$h_p$ = 1.11

$h_f = 1.2\ (1.11) = 1.33$ ft

Compute Total Head loss ($h_t$)

$h_t$ = elevation head + pressure head + $h_f$

10 ft + 3 ft + 1.33 ft

$h_t$ = 14.33 ft

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY CDH DATE 7/17/2001

CHKD. BY _____ DATE _____

| | | | |
|---|---|---|---|
| CLIENT | Ray & Jenny Mulligan | SHEET | 2 OF 2 |
| PROJECT | Residential Septic System Design | PROJECT NO. | 1002066 |
| SUBJECT | Pump Selection | | |

III. Pump Selection (cont'd)

Pressure Head (hp) for Lines.

Pressure head required for even distribution.

Check 1 1/4 Pipe

From Table 3.

64/100 x 5.23 = 3.3 ft Friction loss

Use. hp = 5 ft due to length of lines.

ht = (5 ft) + (5 ft) + 1.33

ht = 11.33 feet. Use ht = 20 ft.

Use. Myers ME 50

Sizing to be Checked w/ Hughes Supply / Local Manufacturers Representatives

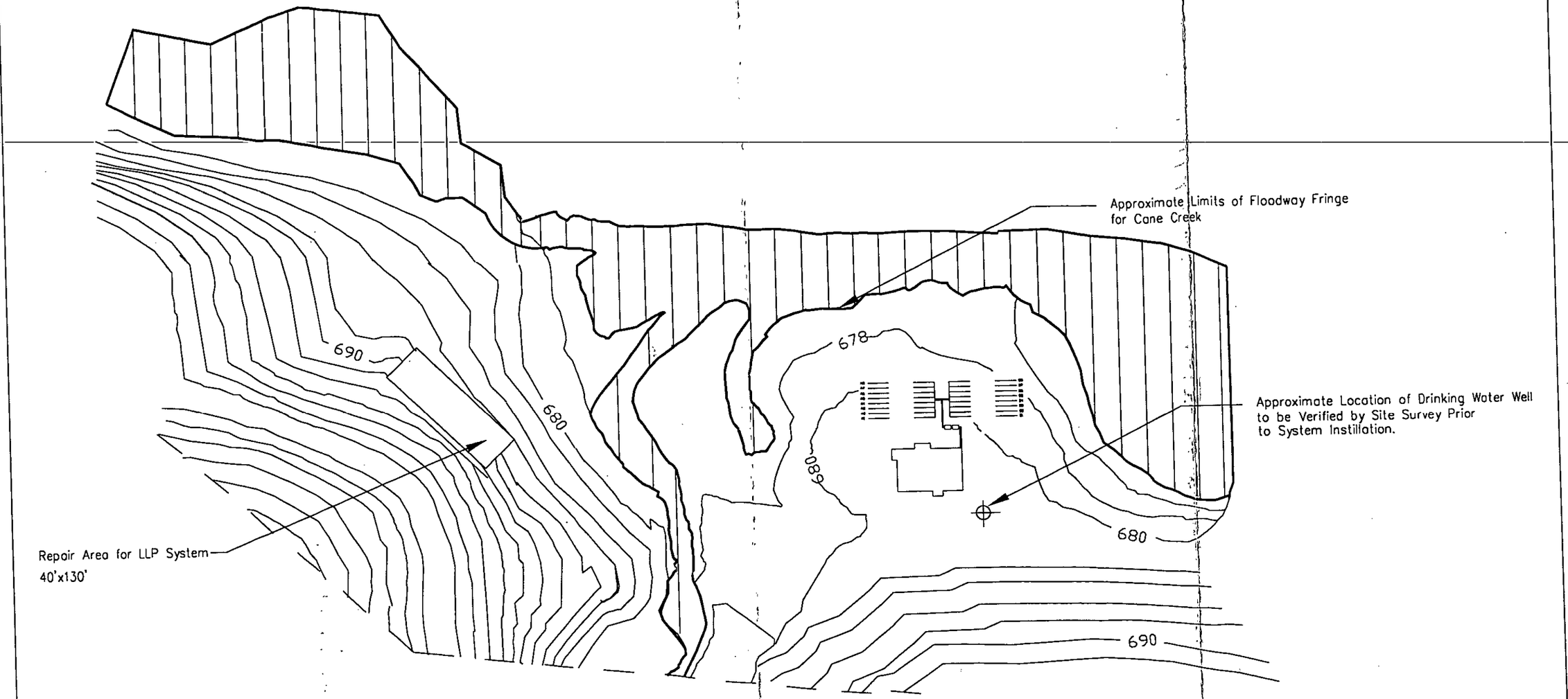
ME 50 - Pumps are designed for Pressure Distribution Systems

ME 50 Curve indicates 80 GPM @ 20 ft of head.

Note: Pump is over sized to account for Pressure System and Solids.

# APPENDIX B

## System Layout and Drawings




NOTE: This Diagram is for the location and identification of System provided from a preliminary Non-Recorded Topographic Information provided by Mr. Raymond Mulligan

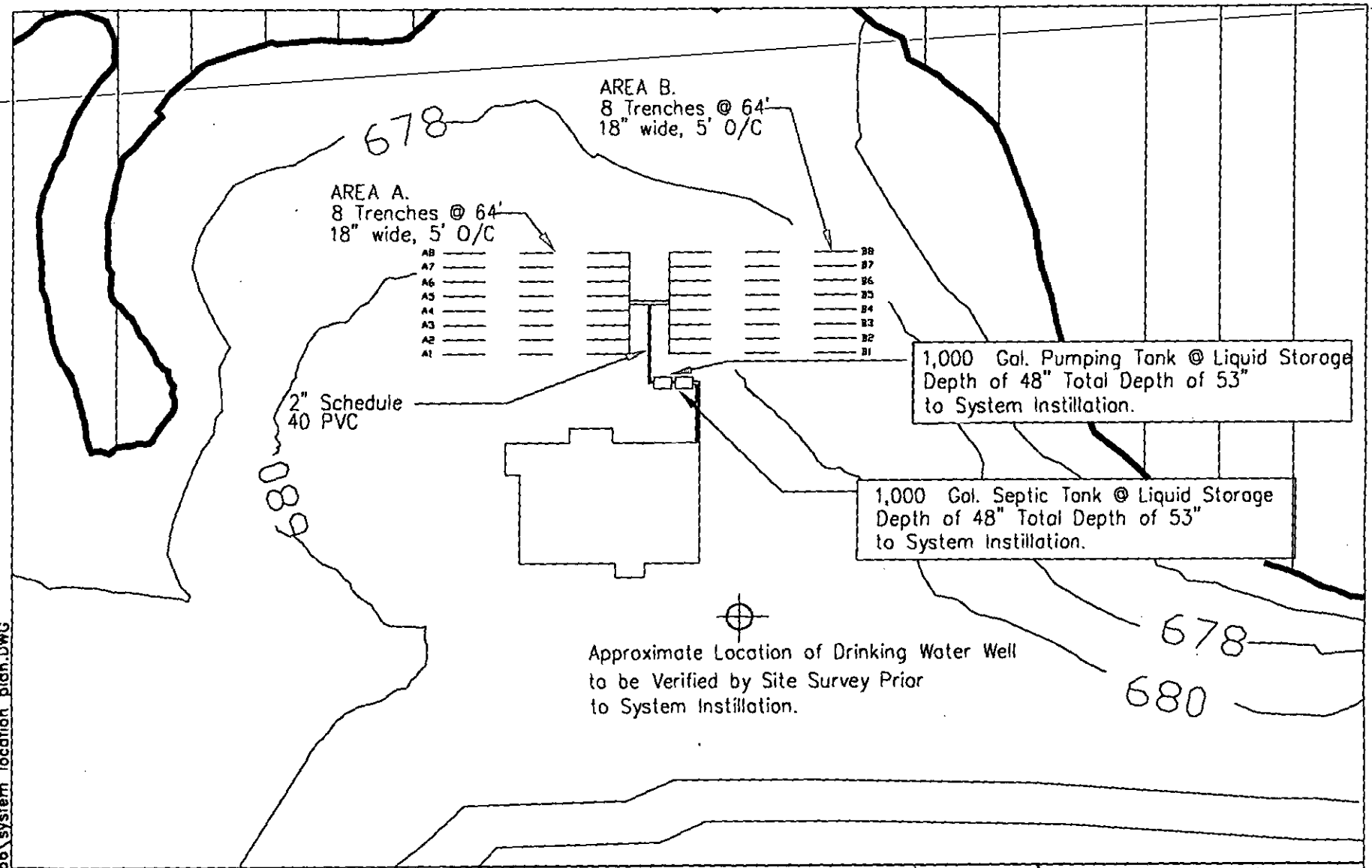
GEO–ENVIRONMENTAL CONSULTANTS
A DIVISION OF SHIELD ENVIRONMENTAL ASSOCIATES INC.
11704 REAMES ROAD, CHARLOTTE, NC 28269
PHONE (704)596-8788 FAX (704)596-8770

| | |
|---|---|
| PROJECT #: | 1002066 |
| DATE: | 7/24/00 |
| PROJECT MGR: | C.D.H. |
| DESIGN BY: | C.D.H. |
| DRAWN BY: | M.B. |
| SCALE: | 1"=100' |

Raymond & Jenny Mulligan
Residential Septic System
CHARLOTTE, NORTH CAROLINA

SITE PLAN — FIGURE 1

P:\PROJ\RMATT\11x17H.DWG



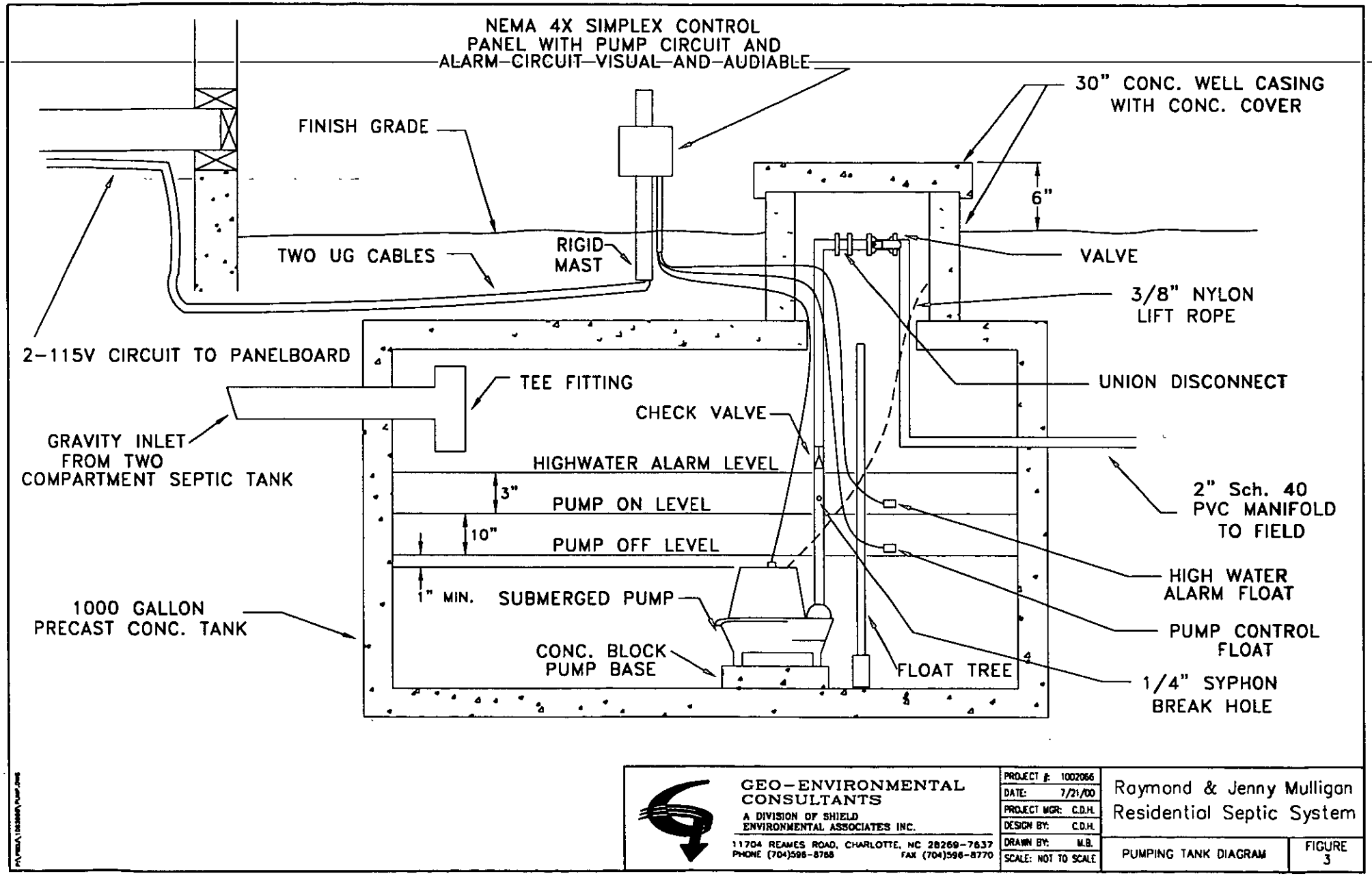

P:\PROJ\1002066\system location plan.DWG

NOTE: Septic Drain Field to be Layed out by Surveyor (See Table 4 for Invert Elevations)

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A Division of Shield Environmental Associates Inc.
GEOTECHNICAL/ENVIRONMENTAL ENGINEERS & SCIENTISTS
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PHONE (704)596-8788 FAX (704)596-8770

| | |
|---|---|
| PROJECT #: | 1002066 |
| DATE: | 7/24/2000 |
| PROJECT MGR: | C.O.H. |
| DESIGN BY: | C.O.H. |
| DRAWN BY: | M.B. |
| SCALE: | 1"= 50' |

Raymond & Jenny Mulligan
Residential Septic System
System Location Plan
FIGURE 2



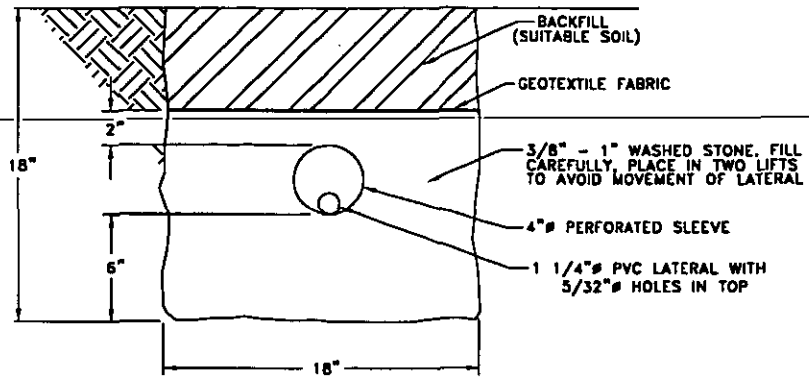

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PHONE (704)596-8788 FAX (704)596-8770

| | |
|---|---|
| PROJECT #: | 1002066 |
| DATE: | 7/21/00 |
| PROJECT MGR: | C.D.H. |
| DESIGN BY: | C.D.H. |
| DRAWN BY: | M.B. |
| SCALE: | NOT TO SCALE |

Raymond & Jenny Mulligan
Residential Septic System

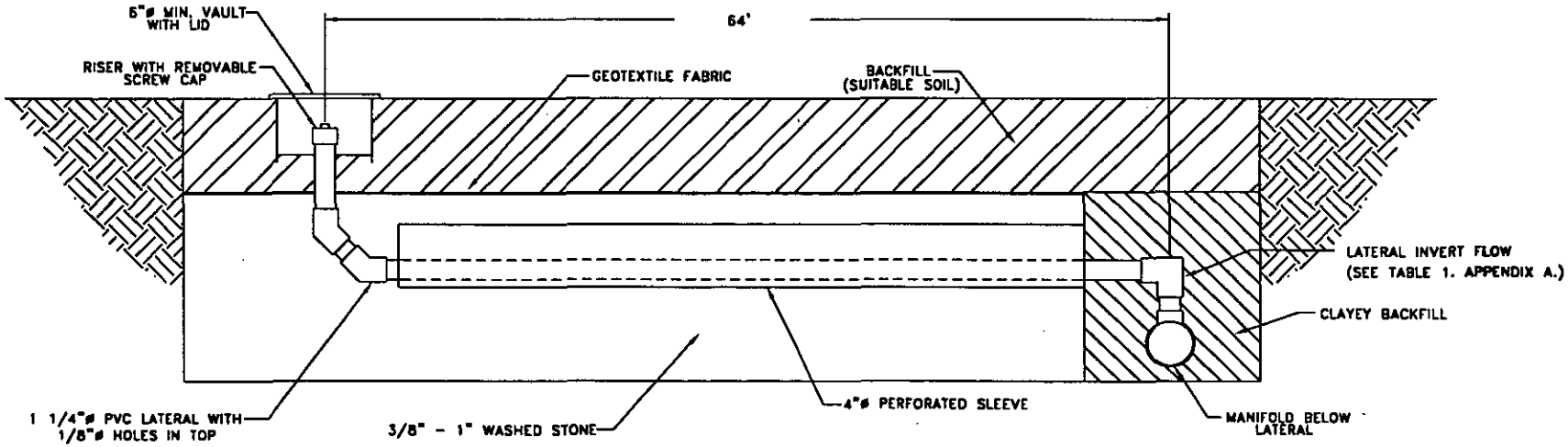
PUMPING TANK DIAGRAM

FIGURE 3




## LATERAL TRENCH

NOT TO SCALE




## MANIFOLD AND LATERAL

NOT TO SCALE

P:\PROJ\1002066\DTL-LPP.DWG

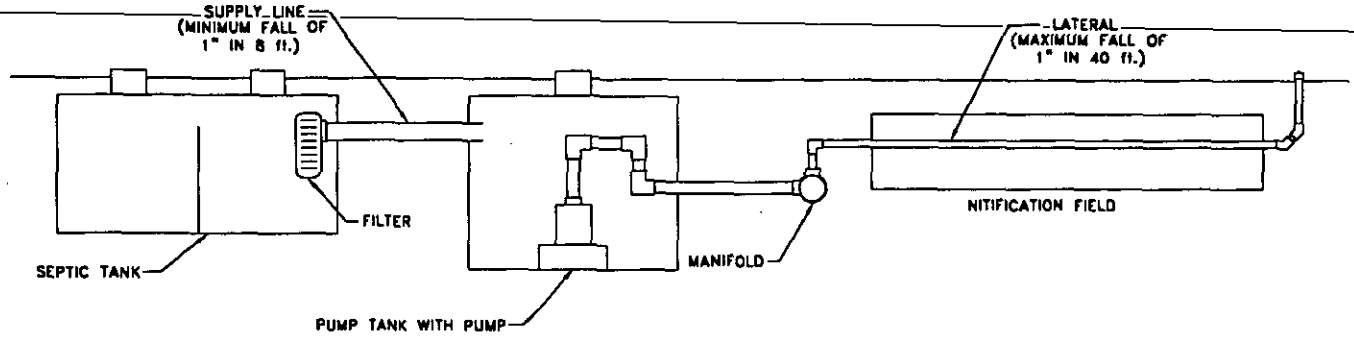
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11704 REAMES ROAD, CHARLOTTE, NC 28269-7637
PHONE (704)596-8788 FAX (704)596-8770

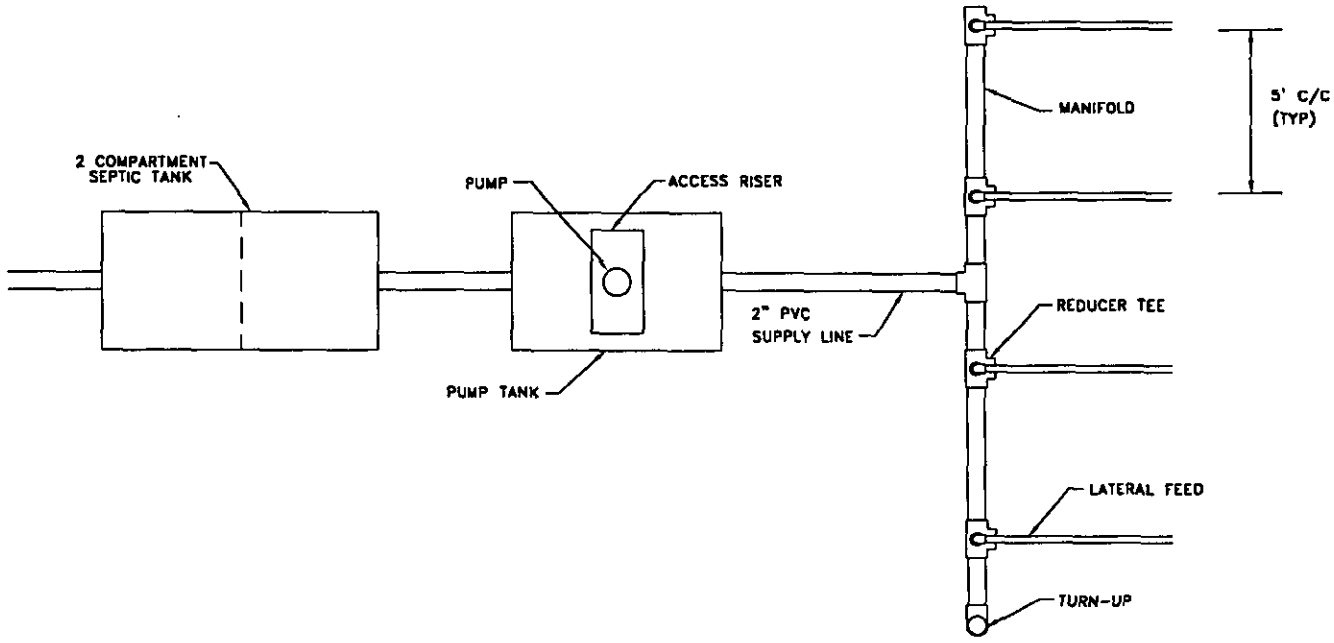
| | |
|---|---|
| PROJECT #: | 1002066 |
| DATE: | 7/21/00 |
| PROJECT MGR: | C.D.H. |
| DESIGN BY: | C.D.H. |
| DRAWN BY: | M.B. |
| SCALE: | NOT TO SCALE |

Ray & Jenny Mulligan
Residential Septic System

LPP LATERALS

FIGURE 4




P:\PROJ\1002066\DTL-MNFLD.DWG

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PHONE (704)596-8788 FAX (704)596-8770

| | |
|---|---|
| PROJECT #: | 1002066 |
| DATE: | 7/20/00 |
| PROJECT MGR: | C.D.H. |
| DESIGN BY: | C.D.H. |
| DRAWN BY: | M.B. |
| SCALE: | NOT TO SCALE |

Raymond & Jenny Mulligan
Residential Septic System
Charlotte, North Carolina

PRESSURE MANIFOLD SYSTEM

FIGURE 5

Map Book 25 Page 962

L. W. Long
6116-663

FILED FOR REGISTRATION
94 FEB -4 PM

Griffin - Parker
5992-370

TRACT 3
8.350 ACRES

TRACT 2
8.305 ACRES

TRACT 1
9.175 ACRES

HUNTERSVILLE TOWNSHIP

CANE CREEK MALLARD CREEK TOWNSHIP

TRACT 4
16.436 ACRES

Approx Location of Mulligan Residence

Stone

N.54-16-12 E.

471.21

969.15

1672.65

1049.11

1015.84

682.68

682.59 TOTAL

574.13 TOTAL

N.40-32-28 W.

S.11-22-03 W.

S.42-38-33 W.

S.43-07-12 W. 2783

S.41-49 W. 1583.05

S.9-20-57 W.

S.5-43-14 W. 1106.86

S.33-29-15 W. 189.70

S.85-09-45 E. 205.06

N.14-13-52 W. 352.57

S.83-47-54 E. 285.30

543.71 TOTAL 256.33

120.85 N.73 E.

510.0

X-SECTION 15 Elev. = 685.6

X-SECTION 14 Elev. = 682.3

X-SECTION 12 Elev. = 675.4

Access

24" Pipe

Pole

15' Easement

30' Easement

Bridge

Floodway

Floodway Fringe District Encroachment Line

Floodway Fringe District Boundary Line

172.27 N.79 E.

280.31

290.0 N.54 E.

79.46 N.18 E. 130.0

50.54 N.74 E. 125.0

257.11

270.0 N.35 E.

72.26 N.20 E.

167.74 240.0 N.7 E. 210.0

240.0 N.62 E.

N.2-30 E.

60' Easement

Duke Power Co. R/W Deed: 1966

R/W

W. A. Wright
1976-501

E.S. Newitt
1985-153

W.A. Wright
1976-501

Huffman
578

# APPENDIX C

## Mecklenburg County Site Evaluation Form and Subsurface Wastewater System Review Checklist

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

ACI #2

Street: _____

Property ID: 019-341-06

Lot #: _____

File #: 47664

# SOIL/SITE EVALUATION
## for ON-SITE WASTEWATER SYSTEM

OWNER: Raymond C. Mulligan APPLICANT: _____

ADDRESS: 7218 Hawbrook Loop Charlotte DATE EVALUATED: 5-25-06

PROPOSED FACILITY: residence PROPOSED DESIGN FLOW (.1949) 480gpd PROPERTY SIZE: .5 ac

LOCATION OF SITE: 11745 Trails End Lane PROPERTY RECORDED: _____

WATER SUPPLY: ☑Private ☐Public ☑Well ☐Spring ☐Other _____

EVALUATION METHOD: ☑Augur Boring ☐Pit ☐Cut

TYPE OF WASTEWATER: ☑Sewage ☐Industrial Process ☐Mixed

| PROFILE # | Slopes 2-12 .1940 Landscape Position/ Slope % | Horizon Depth (IN.) | SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE | .1941 CONSISTENCE MINERALOGY | OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR | .1943 SOIL DEPTH | .1956 SAPRO CLASS | .1944 RESTR. HORIZ | PROFILE CLASS &LTAR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | LS | 0-4" | gr/sl | Fr/SE/PL NS/NP | 2.5Y 7/1 @ 21" | 21" | N/A | None | US IV .125 LPP |
| | | 4-27" | SBK/sc | F:/SE/PL S/P | | | | | |
| 2 | LS | 0-3" | gr/sl | Fr/SE/PL NS/NP | 23" To soil wetness | 23" | N/A | None | PS .391 IV |
| | | 3-23" | SBK/sc | F/SE/PL S/P | | | | | |
| 3 | LS | 0-4" | gr/sl | Fr/SE/PL NS/NP | 2.5Y 7/1 @ 26" | 30" | N/A | None | US .125 IV |
| | | 4-18" | SBK/sc | F:/SE/PL S/P | | | | | |
| | | 18-30" | SBK/sc | Fr/SE/PL SS/SP | | | | | |
| 4 | LS | 0-5" | gr/sl | Fr/SE/PL NS/NP | 28" To soil wetness | 20" | N/A | None | US .125 IV |
| | | 5-20" | SBK/sc | F:/SE/PL S/P | | | | | |
| 5 | LS | 0-3" | gr/sl | Fr/SE/PL NS/NP | 25" To soil wetness | 25" | N/A | None | US .125 IV |
| | | 3-25" | SBK/sc | F:/SE/PL S/P | | | | | |

| DESCRIPTION | INITIAL SYSTEM | REPAIR SYSTEM |
|---|---|---|
| Available Space (.1945) | 4J | |
| System Type(s) | | |

OTHER FACTORS (.1946): _____

SITE CLASSIFICATION (.1938): Approved

| | | | |
|---|---|---|---|
| Available Space (.1945) | 42 | | OTHER FACTORS (.1946): |
| System Type(s) | | | SITE CLASSIFICATION (.1948): unsuitable |
| Site LTAR | .125 gpf | | EVALUATED BY: W.B. Mullins 5-31-06 |
| | | | OTHER(S) PRESENT: |

FILE # 4996A

COMMENTS Not suitable WOT to Repair system

| LANDSCAPE POSITION | GROUP | TEXTURE | .1955 LTAR |
|---|---|---|---|
| R-RIDGE | I | S-SAND | 1.2-0.8 |
| S-SHOULDER SLOPE | | LS-LOAMY SAND | |
| L-LINEAR SLOPE | | | |
| FS-FOOT SLOPE | II | SL-SANDY LOAM | 0.8-0.6 |
| N-NOSE SLOPE | | L-LOAM | |
| H-HEAD SLOPE | | | |
| CC-CONCLAVE SLOPE | III | SI-SILT | 0.6-0.3 |
| CV-CONVEX SLOPE | | SICL-SILTY CLAY LOAM | |
| T-TERRACE | | CL-CLAY LOAM | |
| FP-FLOOD PLAIN | | SCL-SANDY CLAY LOAM | |
| | IV | SC-SANDY CLAY | 0.4-0.1 |
| | | SIC-SILTY CLAY | |
| | | O-ORGANIC | |

| CONSISTENCE | |
|---|---|
| MOIST | WET |
| VFR-VERY FRIABLE | NS-NON-STICKY |
| FR-FRIABLE | SS-SLIGHTLYSTICKY |
| FI-FIRM | S-STICKY |
| VFI-VERY FIRM | VS-VERY STICKY |
| EFI-EXTREMELY FIRM | NP-NON-PLASTIC |
| | SP-SLIGHTLYSTICKY |
| | P-PLASTIC |
| | VP-VERY PLASTIC |

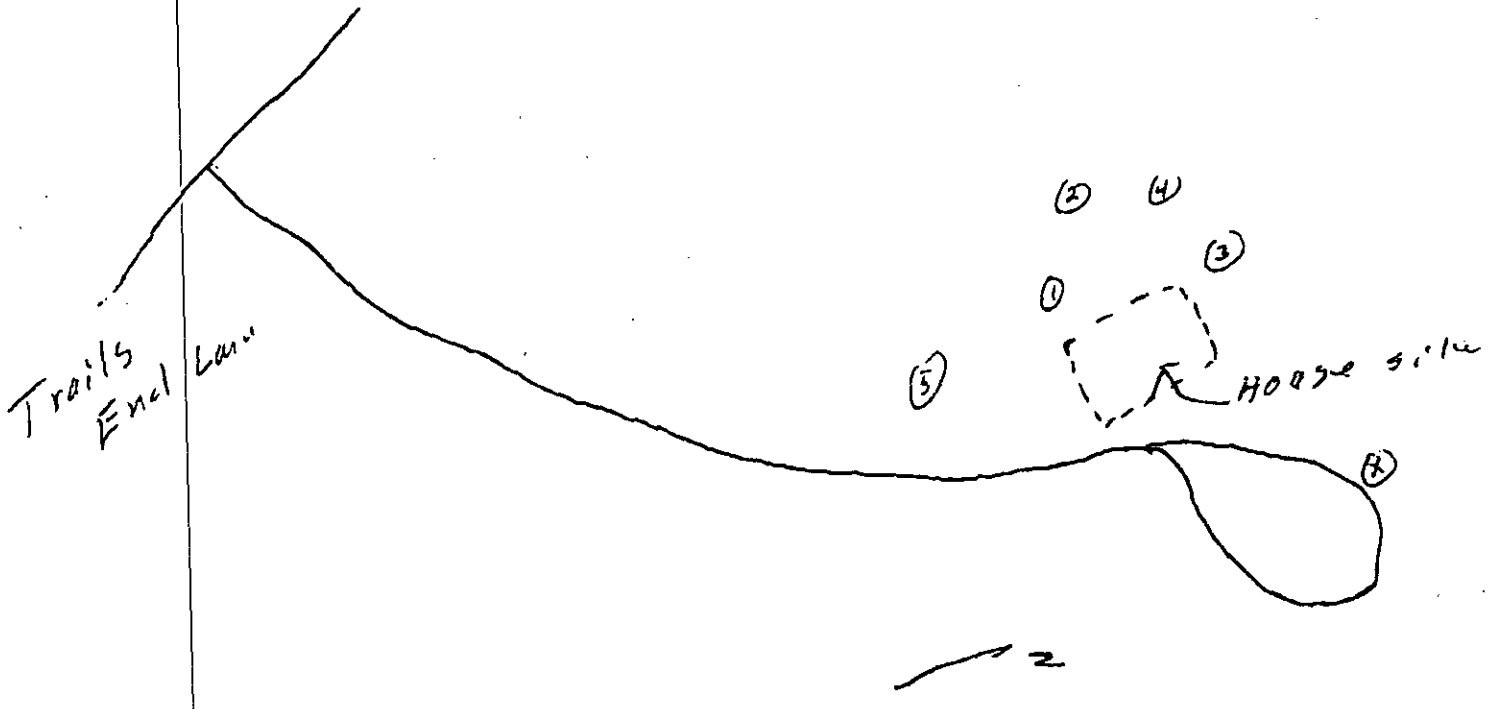
STRUCTURE

SG-SINGLE GRAIN
M-MASSIVE
CR-CRUMB
GR-GRANULAR
SBK-SUBANGULAR BLOCKY
ABK-ANGULAR BLOCKY
PL-PLATY
PR-PRISMATIC

MINERALOGY

SLIGHTLY EXPANSIVE

EXPANSIVE



# Mecklenburg County Environmental Health
# Subsurface Wastewater System Review Checklist

## Application Information

- [x] Application for Improvement Permit has been submitted to Mecklenburg County Health Department
- [x] Property has been shown on plat or boundary survey, and MCHD file number have been provided
- [x] Name, address, phone, fax, e-mail information for owner, agent, engineer, soils consultant are attached
- [x] Project proposed is described, including whether new, repair, expansion, replacement, modification of existing, or combination
- [x] Water supplies (existing and proposed) and surface waters have been described and locations shown
- [x] Facilities are described and located (existing and proposed) which are to be served by proposed system, including occupancy and projected use patterns
- [x] Wastewater system components are described and located (existing and proposed)

## Plans and Specifications for Specific System Components

- [x] Tanks located accessible to pumpers and maintenance vehicles with all setbacks shown
- [x] Plans show tank dimensions and nominal capacities
- [ ] Plans show pertinent elevations in pump tanks (i.e., float activation levels) or siphon tanks (i.e., siphon-trip and alarm elevations)
- [x] Access risers, manholes, sanitary tee and effluent filter details shown
- N/A [ ] For grease traps, design and construction specifications are provided in accordance with Rule .1955(k)
- [x] Tank installation (e.g.: bedding, method of sealing tank and riser, pipe connections, surface water diversion) and water tightness testing procedures are provided
- [x] Plans show pumps, discharging piping, and all related appurtenances
- [x] Calculations provided for system total dynamic head, pump is specified, pump curve(s) provided, and expected operating conditions specified
- [x] Plans show accessible pump removal system and accessible float support system, float switches and float settings
- [x] Plans show simplex or duplex Nema 4X rated pump control panel with high water alarm components

## Ground Absorption Fields

- [x] Final layout, existing and finished ground elevations are shown on the plans See Design Report
- [x] All lines have been staked in the field as needed to verify layout, relative elevations and distribution system design See Design Report, Will be layed out by surveyor
- [x] Trench and lateral distribution system plan and profile details and invert elevations for each lateral are shown on the plans Table 1 Appendix A
- [x] Manifold and supply line and interconnection details and invert elevations are shown on the plans
- [x] Flow distribution device design, construction detail, location, and invert elevations shown on the plans
- [x] Drainage system locations, discharge points and design details are shown on the plans
- [x] Site preparation procedures have been specified
- [x] Construction phasing and phased system testing has been specified
- [x] Final landscaping provisions have been specified, including compliance with erosion control requirements

## Applicant's Soil Scientist Field Evaluations

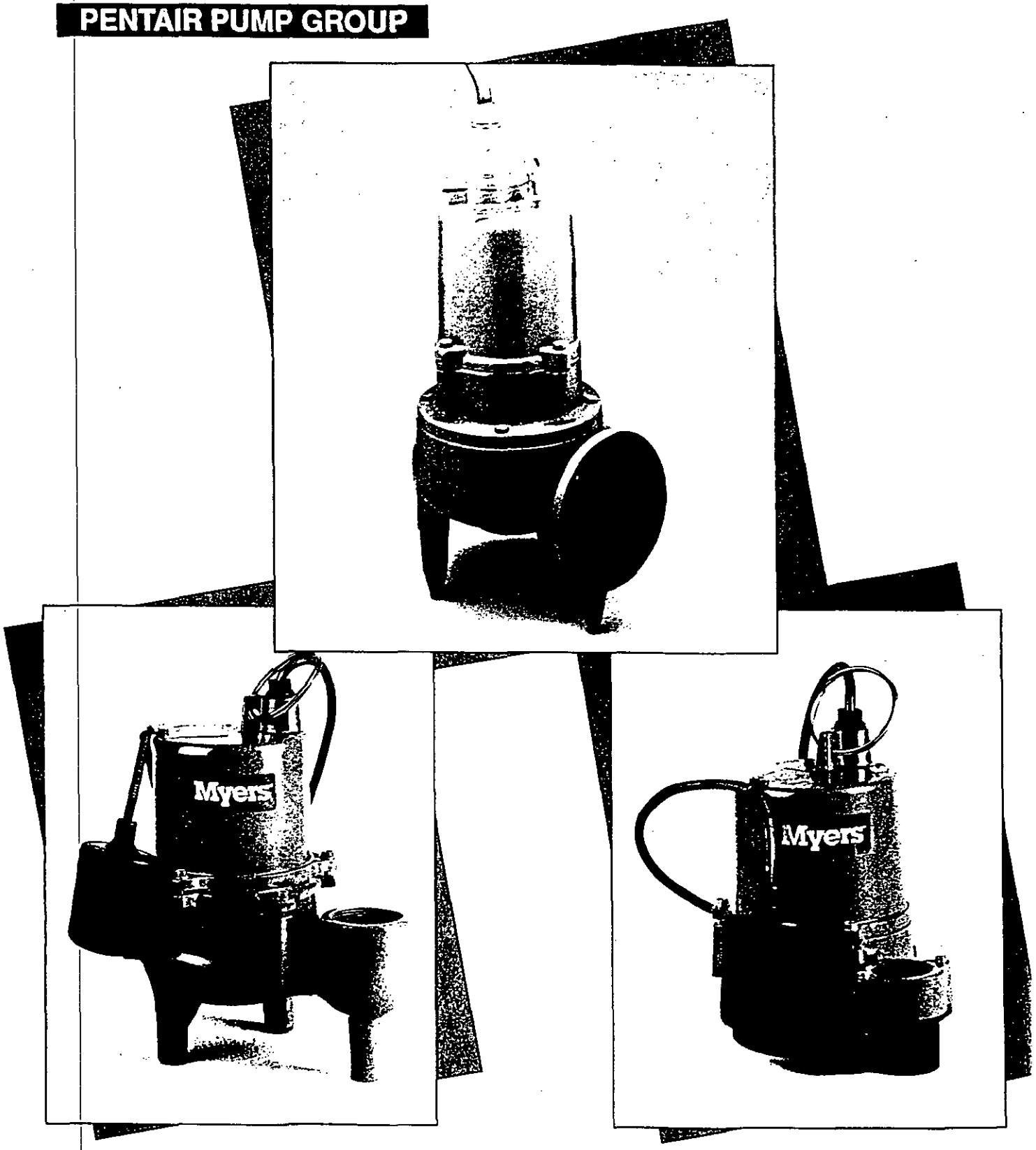
- [x] For sites originally classified unsuitable, written documentation indicating that the proposed system can reasonably be expected to function satisfactorily, in accordance with Rule .1948(d)
- [x] Recommended LTAR (if not provided) for conventional, LPP, or other proposed system with justifying references
- N/A [ ] In-situ hydraulic conductivity measurements in the most restrictive horizon within two feet of the trench bottom to support selected LTAR
- N/A [ ] Logs from deep borings or pits identifying restrictive layers, relevant changes in texture and density

# APPENDIX D

## System Equipment Information

# Myers

**PENTAIR PUMP GROUP**




# Sump and Sewage Pumps
# 1/6 - 5 HP

# 3/4" SOLIDS HANDLING EFFLUENT PUMPS

## ME40 - 1½" Discharge, 1½" Pipe

| PIPE LENGTH FEET | GPM VERTICAL HEAD FEET | | | | | | |
|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 27 | 30 |
| 100 | 50 | 42 | 35 | 28 | 20 | 12 | 7 |
| 200 | 37 | 32 | 28 | 22 | 15 | 10 | 5 |
| 300 | 32 | 24 | 21 | 18 | 12 | 8 | 4 |
| 400 | 27 | 23 | 20 | 16 | 11 | 6 | |
| 600 | 23 | 21 | 18 | 13 | 10 | 5 | |
| 800 | 21 | 19 | 16 | 12 | 8 | 4 | |
| 1000 | 19 | 17 | 15 | 11 | 7 | 3 | |
| 1500 | 15 | 14 | 12 | 10 | 6 | | |

## ME40 - 1½" Discharge, 2" Pipe

| PIPE LENGTH FEET | GPM VERTICAL HEAD FEET | | | | | | |
|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 27 | 30 |
| 100 | 65 | 57 | 48 | 37 | 23 | 15 | 8 |
| 200 | 58 | 50 | 42 | 32 | 20 | 14 | 5 |
| 300 | 49 | 42 | 35 | 28 | 18 | 12 | 4 |
| 400 | 44 | 39 | 32 | 26 | 17 | 11 | 4 |
| 500 | 41 | 36 | 31 | 23 | 16 | 11 | 3 |
| 600 | 38 | 33 | 28 | 22 | 15 | 10 | |
| 800 | 33 | 31 | 26 | 20 | 12 | 8 | |
| 1000 | 31 | 28 | 23 | 18 | 11 | 7 | |
| 1500 | 27 | 21 | 20 | 16 | 10 | 6 | |
| 2000 | 22 | 20 | 18 | 12 | 9 | 5 | |

## ME50 - 2" Discharge, 2" Pipe

| PIPE LENGTH FEET | GPM VERTICAL HEAD FEET | | | | | | |
|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 35 | 40 | 45 | 50 |
| 100 | 79 | 69 | 58 | 51 | 42 | 32 | 19 |
| 200 | 70 | 61 | 50 | 43 | 35 | 26 | 12 |
| 300 | 65 | 57 | 46 | 40 | 31 | 23 | 11 |
| 400 | 60 | 52 | 44 | 39 | 30 | 22 | 10 |
| 500 | 55 | 49 | 40 | 34 | 28 | 20 | 9 |
| 600 | 52 | 46 | 38 | 32 | 27 | 19 | 8 |
| 700 | 50 | 44 | 36 | 31 | 24 | 18 | 7 |
| 800 | 49 | 42 | 33 | 30 | 23 | 17 | 6 |
| 1000 | 43 | 38 | 31 | 27 | 21 | 16 | 4 |
| 1200 | 41 | 37 | 30 | 23 | 20 | 13 | |
| 1500 | 37 | 34 | 25 | 22 | 19 | 12 | |
| 2000 | 32 | 28 | 22 | 19 | 15 | 11 | |

## ME75 - 2" Discharge, 2" Pipe

| PIPE LENGTH FEET | GPM VERTICAL HEAD FEET | | | | | | |
|---|---|---|---|---|---|---|---|
| | 20 | 30 | 40 | 50 | 55 | 60 | 65 |
| 100 | 78 | 65 | 52 | 35 | 22 | 5 | |
| 200 | 68 | 58 | 45 | 29 | 18 | | |
| 300 | 62 | 52 | 42 | 25 | 17 | | |
| 400 | 58 | 50 | 40 | 24 | 16 | | |
| 500 | 52 | 49 | 36 | 22 | 15 | | |
| 600 | 51 | 43 | 34 | 21 | 13 | | |
| 700 | 48 | 41 | 33 | 20 | 12 | | |
| 800 | 46 | 39 | 31 | 19 | 11 | | |
| 1000 | 41 | 35 | 28 | 18 | 10 | | |
| 1200 | 35 | 32 | 25 | 16 | 9 | | |
| 1500 | 34 | 29 | 23 | 13 | 8 | | |
| 2000 | 31 | 26 | 20 | 12 | 7 | | |

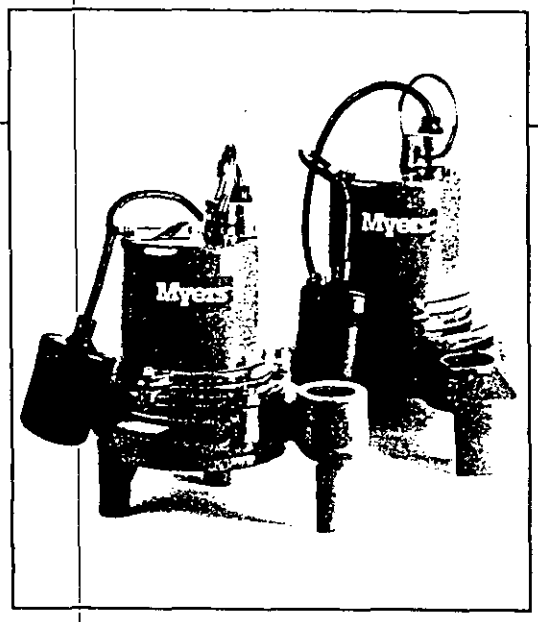
## ME100 - 2" Discharge, 2" Pipe

| PIPE LENGTH FEET | GPM VERTICAL HEAD FEET | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 20 | 30 | 40 | 50 | 60 | 70 | 75 | 80 |
| 100 | 92 | 82 | 72 | 60 | 43 | 25 | 17 | 9 |
| 200 | 81 | 72 | 63 | 52 | 38 | 21 | 13 | 5 |
| 300 | 74 | 67 | 58 | 47 | 34 | 20 | 12 | 4 |
| 400 | 68 | 62 | 54 | 45 | 32 | 19 | 11 | 3 |
| 500 | 62 | 56 | 50 | 40 | 30 | 18 | 10 | |
| 600 | 60 | 53 | 49 | 38 | 28 | 17 | 9 | |
| 700 | 57 | 52 | 44 | 36 | 26 | 16 | 8 | |
| 800 | 54 | 50 | 42 | 34 | 25 | 15 | 7 | |
| 1000 | 49 | 43 | 38 | 32 | 23 | 14 | 6 | |
| 1200 | 45 | 40 | 34 | 29 | 22 | 13 | 5 | |
| 1500 | 41 | 36 | 32 | 26 | 21 | 12 | 4 | |
| 2000 | 36 | 32 | 29 | 23 | 18 | 11 | 3 | |

## ME150 - 2" Discharge, 2" Pipe

| PIPE LENGTH FEET | GPM VERTICAL HEAD FEET | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| 100 | 103 | 95 | 86 | 76 | 64 | 50 | 32 | 13 |
| 200 | 91 | 84 | 76 | 67 | 56 | 42 | 29 | 12 |
| 300 | 82 | 76 | 70 | 62 | 52 | 40 | 25 | 11 |
| 400 | 76 | 70 | 63 | 57 | 49 | 38 | 24 | 10 |
| 500 | 71 | 65 | 58 | 52 | 43 | 35 | 23 | 9 |
| 600 | 66 | 61 | 55 | 50 | 42 | 32 | 22 | 8 |
| 700 | 62 | 58 | 53 | 48 | 41 | 31 | 20 | 7 |
| 800 | 61 | 56 | 52 | 46 | 38 | 30 | 19 | 6 |
| 1000 | 55 | 51 | 46 | 41 | 34 | 28 | 18 | 5 |
| 1200 | 51 | 46 | 42 | 38 | 32 | 25 | 17 | 5 |
| 1500 | 46 | 43 | 39 | 34 | 31 | 22 | 16 | 4 |
| 2000 | 40 | 38 | 33 | 31 | 26 | 21 | 14 | 4 |

**NOTE:** Do not size pump to right of heavy black line if liquid being pumped contains solids.
All Charts include: 1 Check Valve, 1 Gate Valve, 5 Elbows, and PVC Pipe SDR21 (C=150)




# ME3 Series

## High Head (ME3H) and High Flow (ME3F) Submersible Effluent Pumps

**DURABLE MOTOR DELIVERS YEARS OF RELIABLE SERVICE.**

- Oil-filled motor for maximum heat dissipation and continuous bearing lubrication.
- Overload protected, shaded pole motor eliminates starting switches and relays which are prone to fail.
- Heavy cast iron motor housing and volute case dissipate heat, allow motor to run cooler for extended life.

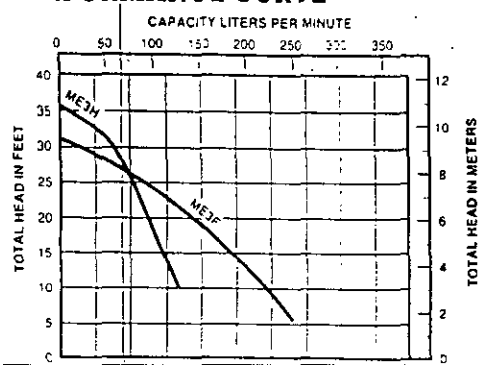
**ENGINEERED FOR MAINTENANCE-FREE OPERATION.**

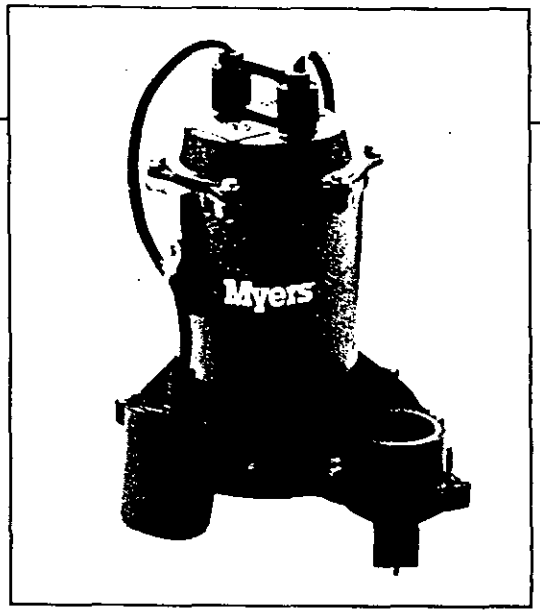
- Field tested, wide angle, mercury-free mechanical float switch for maximum draw down. (Automatic piggy-back models only.)
- Automatic pump models can be operated manually by unplugging piggy-back switch and plugging pump directly into outlet.
- Passes a full 3/4" solid.
- UL, CSA and SSPMA listed.

### PRODUCT CAPABILITIES

| | | | |
|---|---|---|---|
| Capacities To | ME3H<br>ME3F | 36 GPM<br>66 GPM | 136 LPM<br>249 LPM |
| Heads To | ME3H<br>ME3F | 36 ft<br>32 ft | 11.0 m<br>9.75 m |
| Max. Spherical Solids | | 3/4 in | 19 mm |
| Liquids Handling | | domestic effluent and drain water | |
| Intermittent Liquid Temp | | up to 140°F | up to 60°C |
| Motor Electrical Data | | 1/3 hp, 1550 rpm, shaded pole, oil-filled<br>115 volts, 11.5 amps, 1ph, 60 Hz<br>230 volts, 5.8 amps, 1ph, 60 Hz | |
| Third Party Approvals | | UL CSA | |
| Acceptable pH Range | | 5-9 | |
| Specific Gravity | | 9-1.1 | |
| Viscosity | | 28-35 SSU | |
| Discharge NPT | | 1-1/2 in | 50.8 mm |
| Min. Sump Dia. Simplex<br>Duplex | | 24 in<br>36 in | 60.1 cm<br>91.4 cm |

### PERFORMANCE CURVE




# ME40 Series

## 4/10 HP Effluent and Drain Water Pumps

**TWO VANE IMPELLER DESIGN PROVIDES MAXIMUM DOSING EFFICIENCY.**

- Enclosed design for high efficiency pumping.
- Eliminates possibility of jamming between impeller and volute.
- Passes a full 3/4 inch solid.
- Original performance can be restored if wear occurs by replacing volute seat ring.
- UL, CSA, and SSPMA listed.

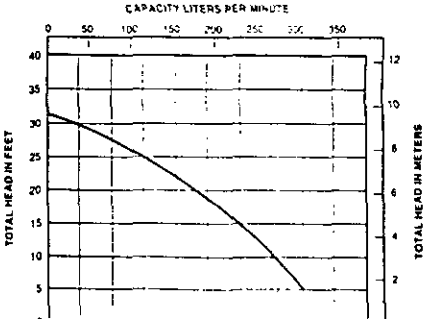
**DURABLE MOTOR WILL DELIVER MANY YEARS OF RELIABLE SERVICE.**

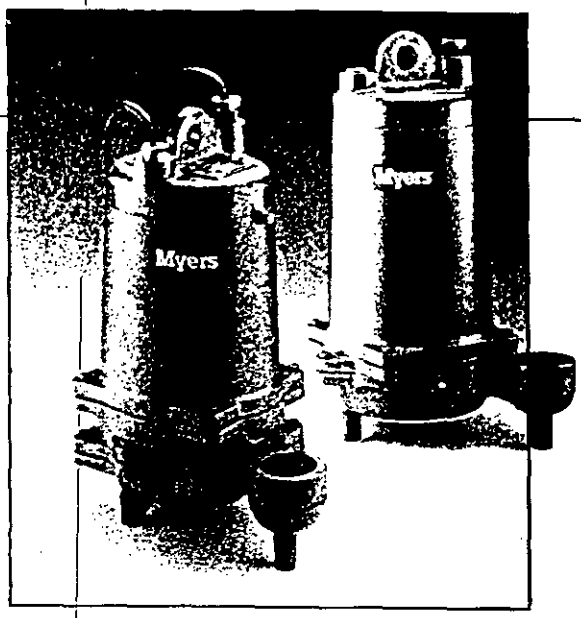
- Oil-filled motor for maximum heat dissipation and continuous bearing lubrication.
- Overload protected, shaded pole motor eliminates starting switches and relays which are prone to fail.
- Positive sealing, quick connect float and switch cords make replacement simple if service is ever necessary.
- Field tested, wide angle, mercury-free mechanical float switch provides maximum draw down. (Automatic models only.)

### PRODUCT CAPABILITIES

| | | |
|---|---|---|
| Capacities To | 80 GPM | 303 LPM |
| Heads To | 32 ft | 9.75 m |
| Maximum Spherical Solids | 3/4 in | 19 mm |
| Liquids Handling | domestic effluent & drain water | |
| Intermittent Liquid Temp | up to 140°F | up to 60°C |
| Motor Electrical Data | 4/10 hp, 1600 rpm<br>shaded pole, oil-filled<br>115 volts, 11.5 amps, 1 ph, 60 Hz<br>230 volts, 5.8 amps, 1 ph, 60 Hz | |
| Third Party Approvals | UL CSA | |
| Acceptable pH Range | 5-9 | |
| Specific Gravity | .9-1.1 | |
| Viscosity | 28-35 SSU | |
| Discharge, NPT | 1-1/2 in | 38.1 mm |
| Min. Sump Dia. Simplex<br>Duplex | 24 in<br>36 in | 61.0 cm<br>91.4 cm |

### PERFORMANCE CURVE






# ME Series

## 1/2 through 1-1/2 HP Effluent Pumps

**IDEAL FOR USE IN MOUND AND TRENCH PRESSURE DISTRIBUTION SYSTEMS.**

- High efficiency, two vane, enclosed impeller provides ideal performance for efficient dosing
- Impeller passes full 3/4 inch solids.
- Enclosed impeller design eliminates possibility of jamming or corrosion between impeller and volute.
- UL, CSA and SSPMA listed

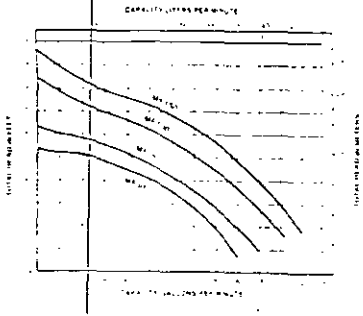
**DURABLE MOTOR WILL DELIVER MANY YEARS OF RELIABLE SERVICE.**

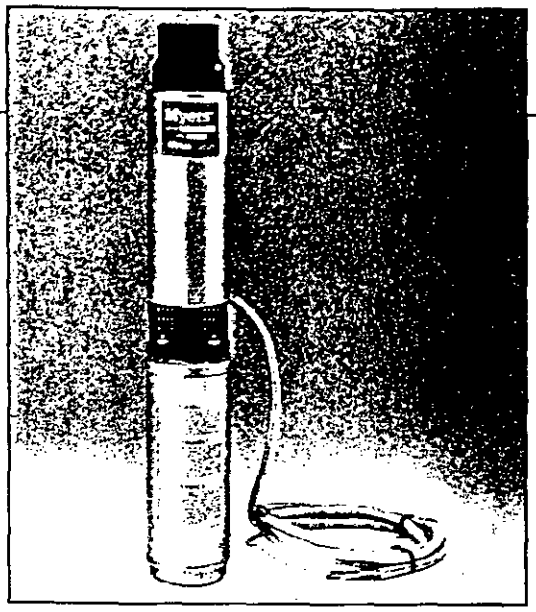
- Oil-filled motor for maximum heat dissipation and constant bearing lubrication.
- High torque, permanent split capacitor (PSC), single phase motors. No starting switches or relays to wear out.
- Optional seal leak probe warns of seal leak condition. (Dual seal motors only.) Helps prevent costly motor damage.
- Motors have a winding current and temperature sensitive overload. (Single phase only.)
- Volute seal ring is replaceable. Restores pump to original performance if wear ring should occur.
- Motor is held in place by 4 screws. Easily removed if service is ever needed.

### PRODUCT CAPABILITIES

| | | |
|---|---|---|
| Capacities To | 120 GPM | 454 LPM |
| Heads To | 98 ft | 29.8 m |
| Max. Spherical Solids | 3/4 in | 19 mm |
| Liquids Handling | domestic effluent & drain water | |
| Intermittent Liquid Temp. | up to 140° F | up to 60°C |
| Motor Electrical Data | 1/2 hp, 115 volts, 1 ph<br>1/2 to 1-1/2 hp, 230 volts, 1 ph<br>208, 230/460/575 volts, 3 ph<br>oil-filled, permanent split capacitor<br>type 1 ph, 3450 rpm, 60 Hz | |
| Motor Insulation | Class B (130°C) | |
| Third Party Approvals | UL, CSA | |
| Acceptable pH Range | 5-9 | |
| Specific Gravity | 9-1.1 | |
| Viscosity | 28-35 SSU | |
| Discharge NPT | 2 in | 50.8 mm |
| Min. Sump Dia. Simplex<br>Duplex | 24 in<br>36 in | 61.0 cm<br>91.4 cm |

### PERFORMANCE CURVE





# 2NFL and J–BE Series

## High Head Filtered Effluent Pumps

**COST EFFECTIVE WASTEWATER SYSTEMS.**

- High pressure capacity
- Corrosion resistant design for long life.
- UL and CSA listed.

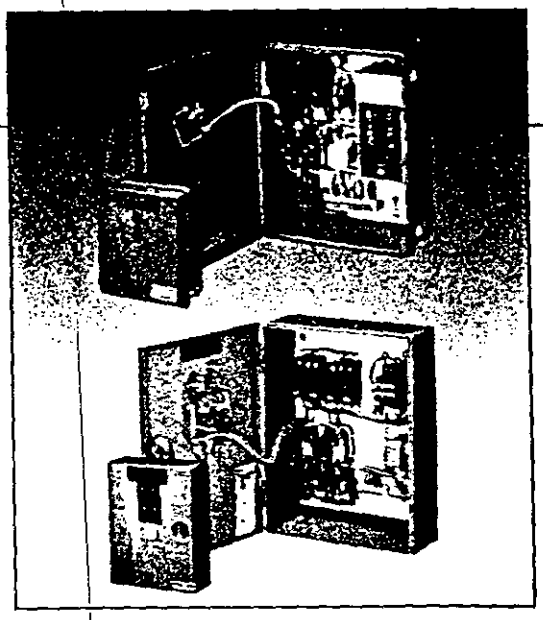
***DEPENDABLE FIELD PROVEN MOTOR.***

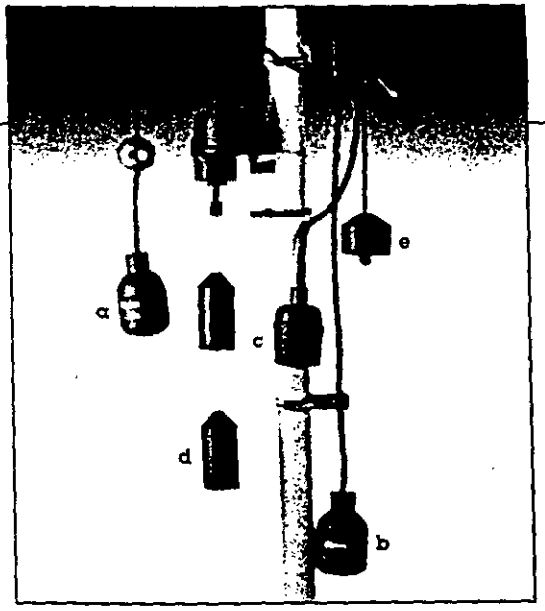
- Stainless steel construction
- Built-in overload and electric surge protection.
- Replaceable 10' jacketed power cord.
- Hermetically sealed windings
- Continuous duty rating
- Frequent cycling capabilities
- Powerful, yet lightweight
- Easy handling and installation

### PRODUCT CAPABILITIES

| | | |
|---|---|---|
| Capacities To | 50 GPM | 189 LPM |
| Heads To | 480 ft | 146.30 m |
| Maximum Spherical Solids | .6 in | 16 mm |
| Liquids Handling | filtered effluent | |
| Maximum Liquid Temp. | 150° F | 68°C |
| Motor Electrical Data | 1/2 hp, 115 volts, 1 ph<br>1 to 1-1/2 hp, 230 volts, 1 ph<br>60 Hz, 3450 rpm | |
| Motor Rating | continuous duty | |
| Max. Motor Starts per 24 Hours | 1/2 and 3/4 hp - 300<br>1 and 1-1/2 hp - 100 | |
| Third Party Listings | UL, CSA | |
| Specific Gravity | 9-1.1 | |
| Viscosity | 28-35 SSU | |
| Discharge NPT<br>8, 12 and 20 GPM<br>25 and 35 GPM | 1 in<br>2 in | 31.8 mm<br>50.8 mm |

**NOTE:** These pumps must be used in a filtered vault.






# CE, CMEP & CMW Simplex and Duplex Electric Control Panels

**QUALITY ELECTRICAL COMPONENTS ASSURE RELIABLE, AUTOMATIC PUMP OPERATION.**

- For 1/4-3 HP sump, sewage and effluent pumps.
- IEC horsepower-rated contactors (1Ø) and motor starters (3Ø)
- 3Ø starters with ambient-compensated quick-trip overloads.
- Include alternating and override relays to maximize pump wear.
- Designed for use with off-on-alarm (simplex) and off-on-lag-alarm (duplex) mercury switches (not included with panel).

**CORROSION RESISTANT FOR LONG LIFE.**

- Weathertight NEMA 4X fiberglass enclosure with outdoor panels.
- Indoor NEMA 1 panels are enamel-coated galvanized steel.

**MEETS NEC AND UL SAFETY STANDARDS.**

- UL-508 approved panel designs.
- Outdoor NEMA 4X panels include standard high water alarm light; indoor NEMA 1 panels include standard high water alarm buzzer.

**WIDE RANGE OF PANEL OPTIONS.**

- Elapsed time meter.
- Alarm bell or horn
- Alarm bell or horn with silence switch.
- Auxiliary contacts
- Condensation heater
- Convenience outlet
- Intrinsically safe relays.
- Lightning arrestor
- Full inner door.
- Cycle counter.
- 24-volt control circuitry
- Transfer switch/generator receptacle.
- Pump delay circuitry.
- Low level cut-off and alarm
- Phase loss circuitry
- Low voltage circuitry

NOTE: Other options also available.

# Level Controls

**a. SMNO and SMNC SUSPENDED MERCURY FLOAT CONTROLS.**

- Available with normally open or closed contact configurations.
- For use with Myers control panels.
- Available in 15' cable lengths.
- UL listed.

**b. PM15NO PIPE MOUNTED MERCURY FLOAT CONTROLS.**

- Available with normally open or closed contact configurations.
- For use with Myers control panels.
- Available in 15' cable lengths.
- UL listed.

**c. MFLC PIGGY-BACK WIDE-ANGLE MERCURY-FREE MECHANICAL FLOAT CONTROLS.**

- Available in 10' or 15' lengths and 115V or 230V plug configurations.
- Directly controls up to 1/2 HP-115V or 1 HP-230V single phase pumps.
- Also available in 3-amp pilot duty, normally open or normally closed configurations, for use with Myers control panels.

**d. ALC-18 PIGGY-BACK SWITCHES.**

- Available in 115V or 230V plug configurations.
- Handles up to 1/2 HP-115V or 1 HP-230V single phase pumps.
- Pump down range adjustable by moving weights to desired levels.
- Standard wiring is normally open, but can be wired normally closed.
- AWS-1 and AWSU-1 versions have built-in connection boxes.

**e. 20VM SJE VERTICAL MASTER™ PUMP SWITCH.**

- Piggy-back plug with 20' cord length.
- Available in 115V or 230V plug configurations.
- Rated at 13 amps for 115V or 230V, single phase use.
- Stainless steel pipe mounting bracket.
- Vertical pumping range of 3/4 to 6-1/2 inches.

# MYERS
# LIMITED WARRANTY
## SUMP & RESIDENTIAL SEWAGE

During the time periods and subject to the conditions hereinafter set forth, **F.E. Myers** will repair or replace to the original user or consumer any portion of your new **MYERS product which proves defective due to defective materials or workmanship of MYERS.** Contact your nearest Authorized **MYERS** Dealer for warranty service. At all times **MYERS** shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts, or components. Damage due to lightning or conditions beyond the control of **MYERS** is NOT COVERED BY THIS WARRANTY.

**WARRANTY PERIOD**

**Pumps:** 12 months from date of installation or 18 months from date of manufacture.

**Labor, etc, Costs: MYERS** shall IN NO EVENT be responsible or liable for the cost of field labor or other charges incurred by any customer in removing and/or reaffixing any **MYERS** product, part or component thereof.

**THIS WARRANTY WILL NOT APPLY:** (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and the parts used in connection with such service; (d) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices; or (e) unit is used for purposes other than for what it was designed and manufactured, and (f) if three phase submersible motors are installed on a single phase power supply using a phase converter or if three phase power is supplied by only two transformers, making an open Delta system.

**RETURN OR REPLACED COMPONENTS:** Any item to be replaced under this Warranty must be returned to **MYERS** in Ashland, Ohio, or such other place as **MYERS** may designate, freight prepaid.

**PRODUCT IMPROVEMENTS: MYERS** reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for units sold and/or shipped prior to such a change or improvement.

**WARRANTY EXCLUSIONS: MYERS** SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AFTER THE TERMINATION OF THE WARRANTY PERIOD SET FORTH HEREIN.

Some states do not permit some or all of the above warranty limitations and, therefore, such limitations may not apply to you. No warranties or representations at any time made by any representative of **MYERS** shall vary or expand the provisions hereof.

**LIABILITY LIMITATION:** IN NO EVENT SHALL **MYERS** BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY **MYERS** PRODUCT OR PARTS THEREOF. PERSONAL INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER INSTALLATION. **MYERS** DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY UNDER THIS WARRANTY, FOR IMPROPER INSTALLATION–**MYERS** RECOMMENDS FOLLOWING THE INSTRUCTIONS IN THE INSTALLATION MANUAL. WHEN IN DOUBT, CONSULT A PROFESSIONAL.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

In the absence of suitable proof of this purchase date, the effective date of this warranty will be based upon the date of manufacture.

**DETERMINATION OF UNIT DATE OF MANUFACTURE:** Submersible Sump pump (8-95) month and year stamped on pump nameplate; column sump pump month and year on red warranty tag.

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Myers
PENTAIR PUMP GROUP

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419/289-1144, FAX: 419/289-6658
www.femyers.com

Myers (Canada), 269 Trillium Drive, Kitchener, Ontario N2G 4W5
519/748-5470, FAX: 519/748-2553

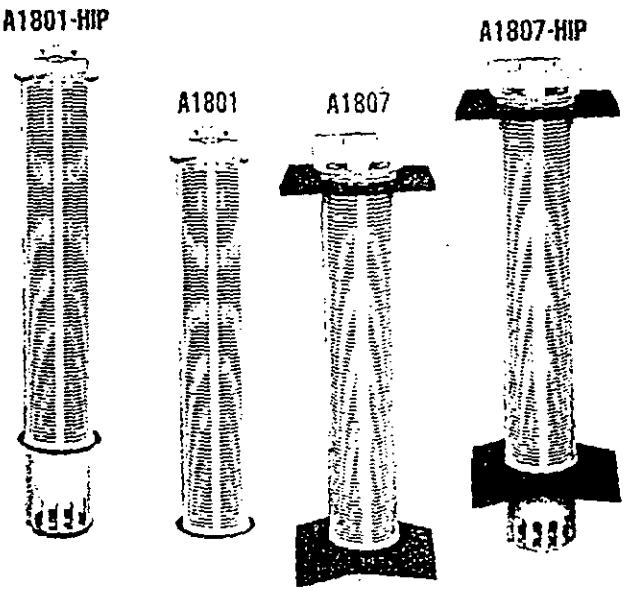
# Zabel™ A1800 Series Residential Wastewater Effluent Filter Product Specification

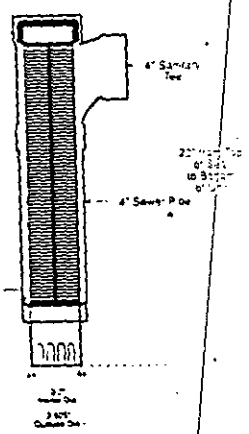
1. Product Name: Zabel™ The A1800 Residential Wastewater Filters, U.S. Patent Nos.: 5,382,357; 5,482,621; Canadian Patent No: 2,135,937; Other patents pending.
2. Model Numbers: A1800; A1800-HIP, A1800-HIP-SF, A1801, A1801-HIP, A1801-HIP-SF, A1807, A1807-HIP
3. Application: Single family homes no more than four bedrooms. **Zabel's™ New Residential High Performance Filter** is designed to provide extra protection for homes with garbage disposals and still sloughs the solids back into the tank.
4. Performance Specification
   4.1. All A1800 Models: Maximum daily flow - 800 gpd.
   4.2. Multiple Filters may be installed in manifolds to handle larger flows.
   4.3. TSS: Average reduction in TSS within 6 months of installation - 40 percent in typical residential wastewater.
5. Materials: All materials are non-corrosive PVC
6. New System Installation: Center the top of the 4-inch Filter Case under an outlet access opening at least 8 inches in diameter. Securely fasten the bell coupling of the case by a PVC solvent weld connection to the 4-inch PVC pipe extending through the outlet wall of the tank. The pipe extending through the end wall may be any schedule four-inch pipe. Location of the PVC outlet pipe in the tank end wall shall conform to local code. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. For septic tanks with cast in place concrete baffles use the A1807 model. Insert bottom of filter through thick gasket and slide to top of filter cartridge. Install filter cartridge with top gasket only into tank baffle, to ensure gasket lies flat without hanging over the edge of baffle. **Do not trim** gasket unless it overhangs edge of baffle. Remove filter cartridge and install thin gasket into the groove at the bottom of the cartridge. Reinsert the cartridge into the concrete baffle to complete installation. A riser to grade over the Outlet Access Opening is recommended.
7. Existing System Installation: The filter cartridge, Model A1801 may be installed in any existing 4" outlet Tee and pipe. The filter may be installed in an existing tank if an adequate outlet access opening already exists and the filter can be installed without damaging the existing tank. If a 4-inch PVC outlet pipe does not extend into the tank, the filter can be installed utilizing a plumbing flange. For septic tanks with cast in place concrete baffles use the A1807 model. Insert bottom of filter through thick gasket and slide to top of filter cartridge. Install filter cartridge with top gasket **only** into tank baffle, to ensure gasket lies flat without hanging over the edge of baffle. **Do not trim** gasket unless it overhangs edge of baffle. Remove filter cartridge and install thin gasket into the groove at the bottom of the cartridge. Reinsert the cartridge into the concrete baffle to complete installation. If the existing tank cannot be used, the filter can be installed in existing systems using a Zabel Container Assembly Model CA100 or Zeus™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36" T-Handle is available if required to reach filters more than 12 inches below grade. Tap the cartridge on the inside of the inspection port or hose off the cartridge into the tank if needed and reinsert into the case. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system
10. Service Frequency: The filter should be cleaned when the septic tank is normally inspected and pumped as required by local regulation. The A1800's are designed to slough most normal solids off the inside of the vertical walls and back into the tank when the effluent flow is in a resting state. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system
11. Warranty: The A1800's are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel's™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.
12. Dimensions:

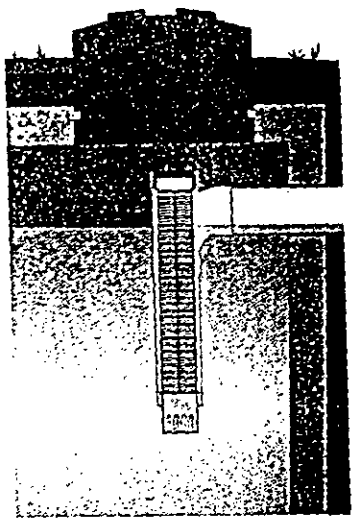
| | Diameter | Cartridge Height | Filtration | Total Filter Surface | Lineal Feet of Weir |
|---|---|---|---|---|---|
| A1800 | 4" | 18" | 1/16" | 158.4 in² | 61 |
| A1800-HIP | 4" | 22" | 1/2"-1/16" | *158.4 in² | *61 |
| A1807 | 4" | 18" | 1/16" | 158.4 in² | 61 |

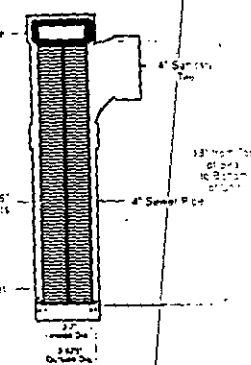
*Calculations are for the 1/16" area only.

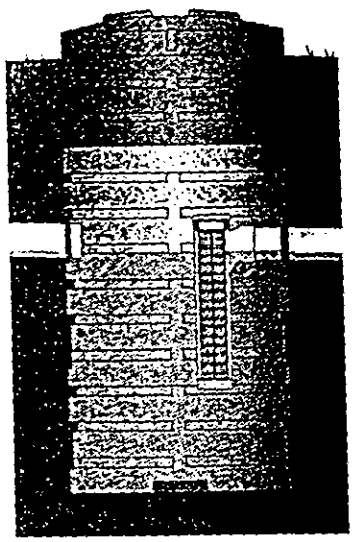
# A1800s

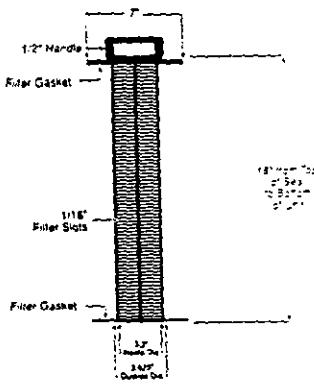


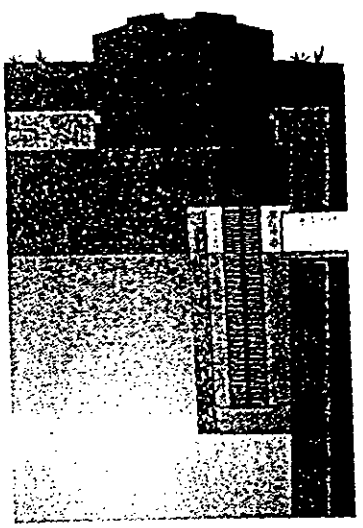











*Zabel™ Recommendation:* Any configuration of Risers used **should not** exceed 48" in height.

*The product(s) shown are* ***covered by one or more of the following patents:***
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584,
U.S. Des. 386,241, 349,367, 4805501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 264824,
Other Patents Pending

Call for a free ZABEL ZONE™ *On Site Wastewater Magazine* **1-800-221-5742** • Website page: www.**zabel**.com

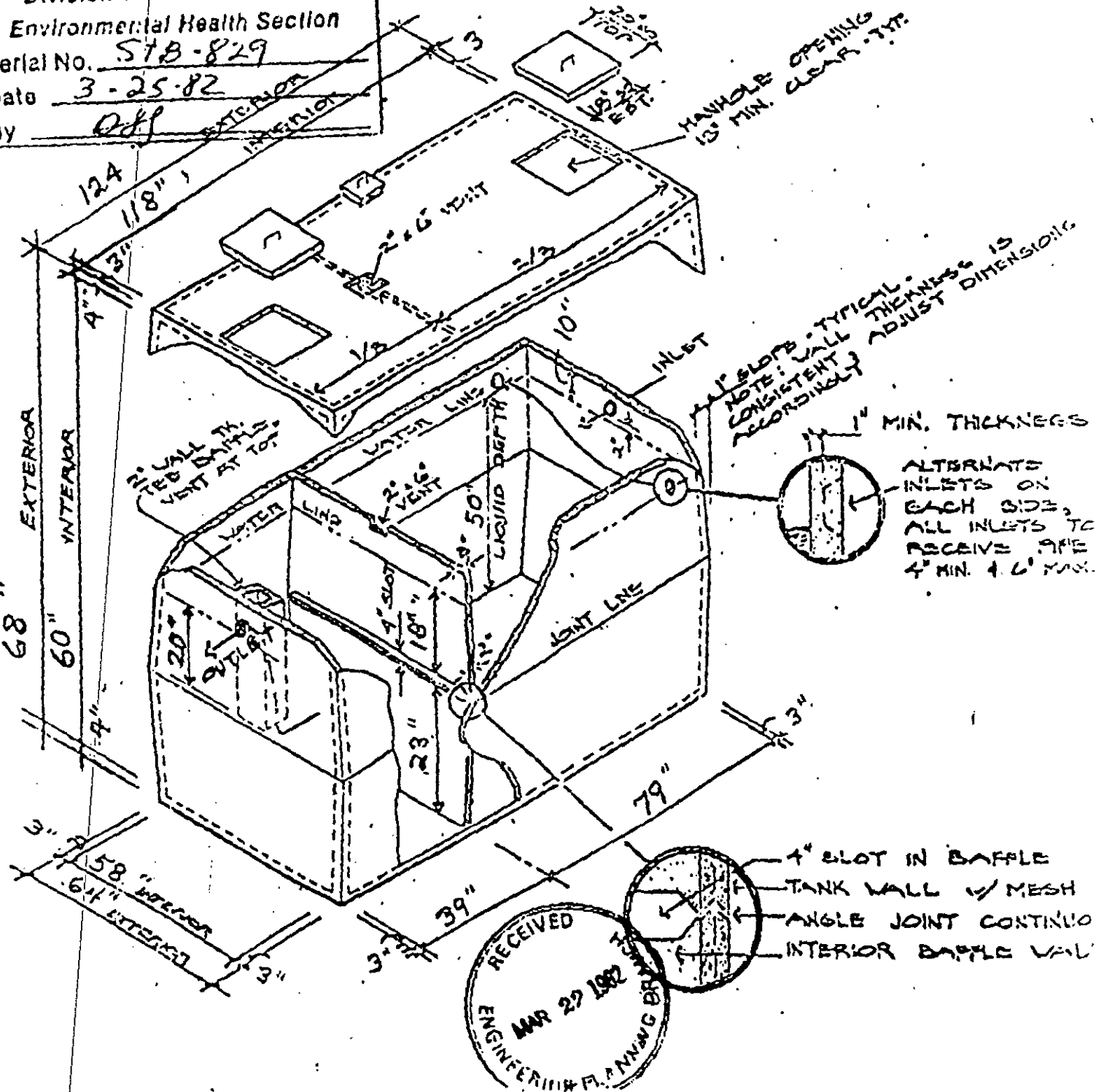
MFG. by : AUTRY CONCRETE PRODUCTS

ADDRESS: 8918 Byrum Drive
Charlotte, N. C. 28217

CONCRETE : 3,000 PSI
REINFORCING: 6" x 6" x 10/10 WIRE MESH (ALL FACES AND BAFFLE)
LIQUID DEPTH: 50" FREEBOARD 10"
LENGTH TO WIDTH RATIO: 2 TO 1
TYPE OF INLET: STRIGHT PIPE
TYPE OF OUTLET: CAST IN PLACE BAFFLE 2/3 in. LIQUID DEPTH
MANHOLE : TWO @ 18" sq. CLEAR OPN.
LIQUID CAPACITY: 1500 GALLONS
MANHOLE HANDLE: #3 REBAR

NOTE : TANK SIZE & MFG'S IDENTIFYING MARK TO BE AT RIGHT OF INLET OPENING

Approved by
Department of Human Resources
Division of Health Services
Environmental Health Section
Serial No. STB-829
Date 3-25-82
By Off




RECEIVED
MAR 29 1982
ENGINEERING & PLANNING BRANCH

Autry Concrete Prod.
918 Byrum Dr.
Charlotte, N.C.
28217
704-357-1250

try - 1000
T - 78

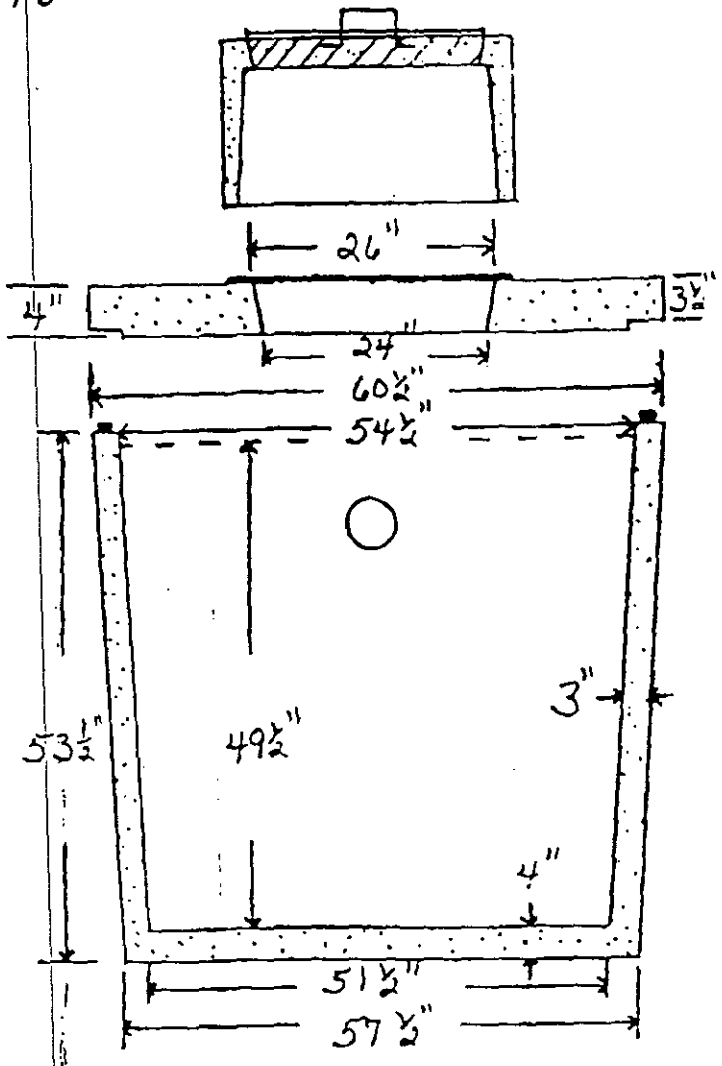
ONE COMPARTMENT PUMP TANK

Tank Size And Mfg's Identifying Imprint To Be At Left Of Outlet Opening.

Manufactured Date On Top Of Tank Immediately Above The Identifying Imprint.

LIQUID CAPACITY: 1000 Gallons

NO. INLETS: 3 NO. OUTLET: 1




OUTLET MANHOLE:
24" sq min. Clearance

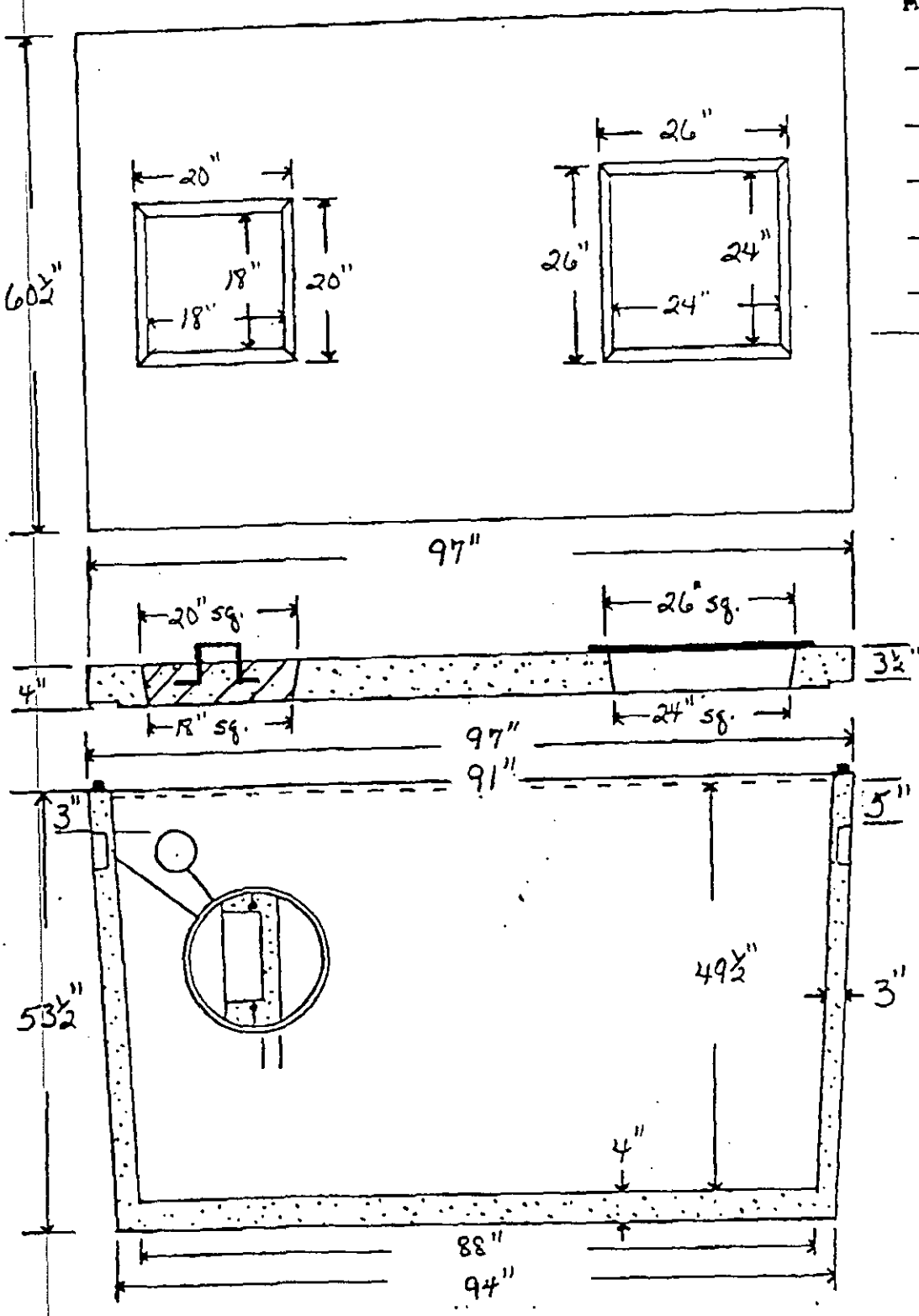
INLET MANHOLE:
18" sq min Clearance with # 3 Rebar Handle

CONCRETE: 3500 PSI

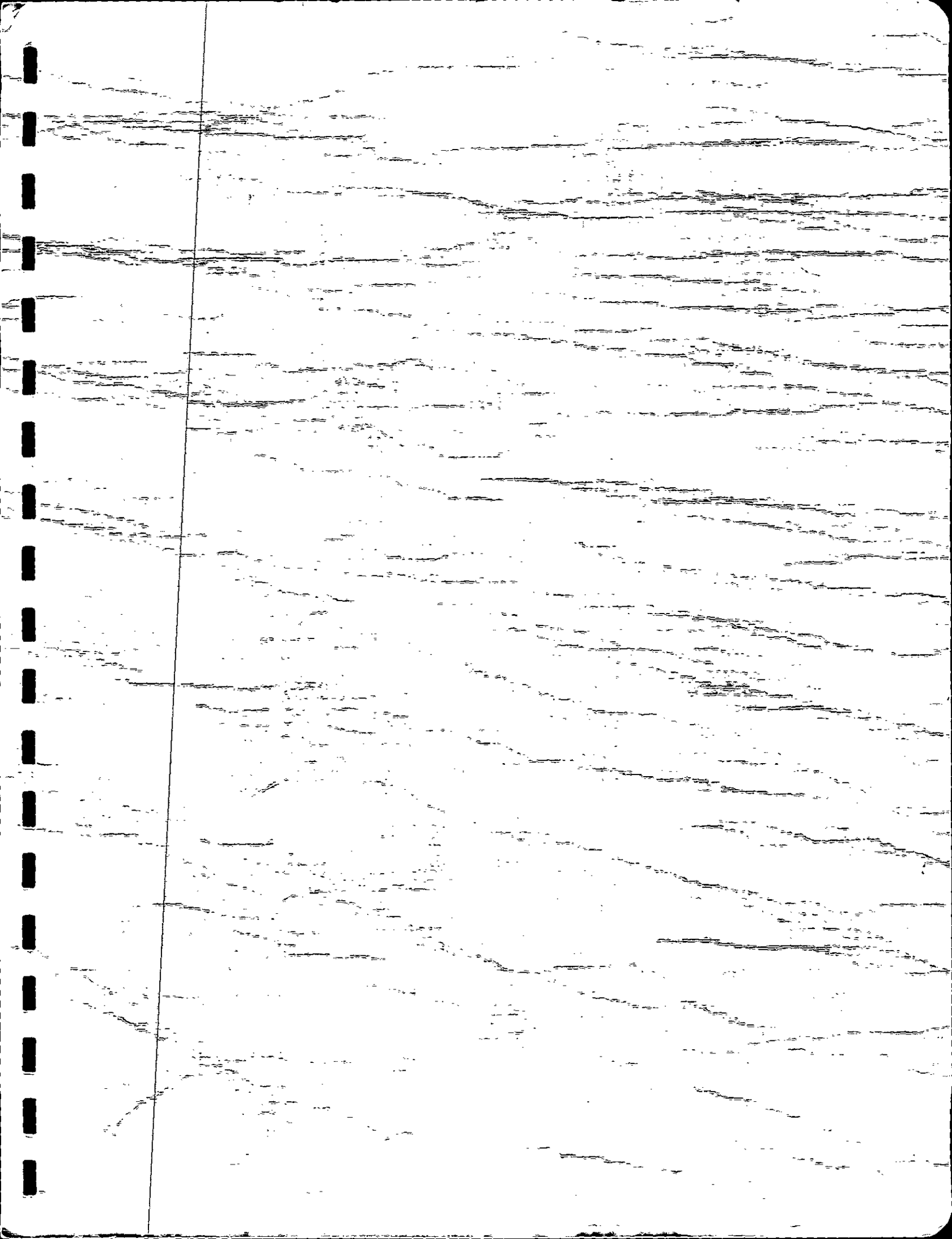
REINFORCING: 6"x6"x 10/10 wire mesh in center of walls, ends, Top & Bottom Additional: See Foot Note

SEALANT: 1" Butyl Rubber Mastic Sealant

NOTE: Additional Reinforcing, 9" on center Both Ways in Top and Bottom use # 3 Rebar




MFG. BY
f
8(
C
Ph
Au
P



FOR REGISTRATION JUDITH A. GIBSON
REGISTER OF DEEDS
MECKLENBURG COUNTY, NC
2000 SEP 11 10:56 AM
BOOK: 11563 PAGE: 209-212 FEE: $12.00
INSTRUMENT # 2000131217

STATE OF NORTH CAROLINA

COUNTY OF MECKLENBURG

WASTEWATER TREATMENT AND DISPOSAL SYSTEM DESIGN AGREEMENT: 15A NCAC 18A .1948 AND ANY OF THE FOLLOWING RULES: .1956; .1957(a); .1957(b); or .1957(c); OR .1969

FILE # 4798 A
PARCEL # 019-171-19

The undersigned, RAYMOND CHARLES MULLIGAN, owner of property located at 11745 TRAILS END LANE, Huntersville NC, (the "site") and described in an instrument recorded in Book 9127 25 at Page 712 912 Mecklenburg Public Registry, hereby acknowledges that the undersigned applied to the Mecklenburg County Health Department (the "Department") for a permit to install a septic tank sewage disposal system on the site; that the Department evaluated the site for suitability for such a system in accordance with the regulations promulgated by the North Carolina Commission for Health Services as 15A NCAC 18A .1900 et seq.; that the Department originally classified the site as "unsuitable" pursuant to the standards set forth in the regulations; that the undersigned requested that the Department reclassify the site as "provisionally suitable" in light of the particular septic tank system proposed by the undersigned; that the Department considered various studies, data, and other information which indicate to the Department that the septic tank system proposed by the undersigned is allowed by the rules; and that the Department therefore reclassified the site as "provisionally suitable" and issued an appropriate permit for such proposed septic tank system.

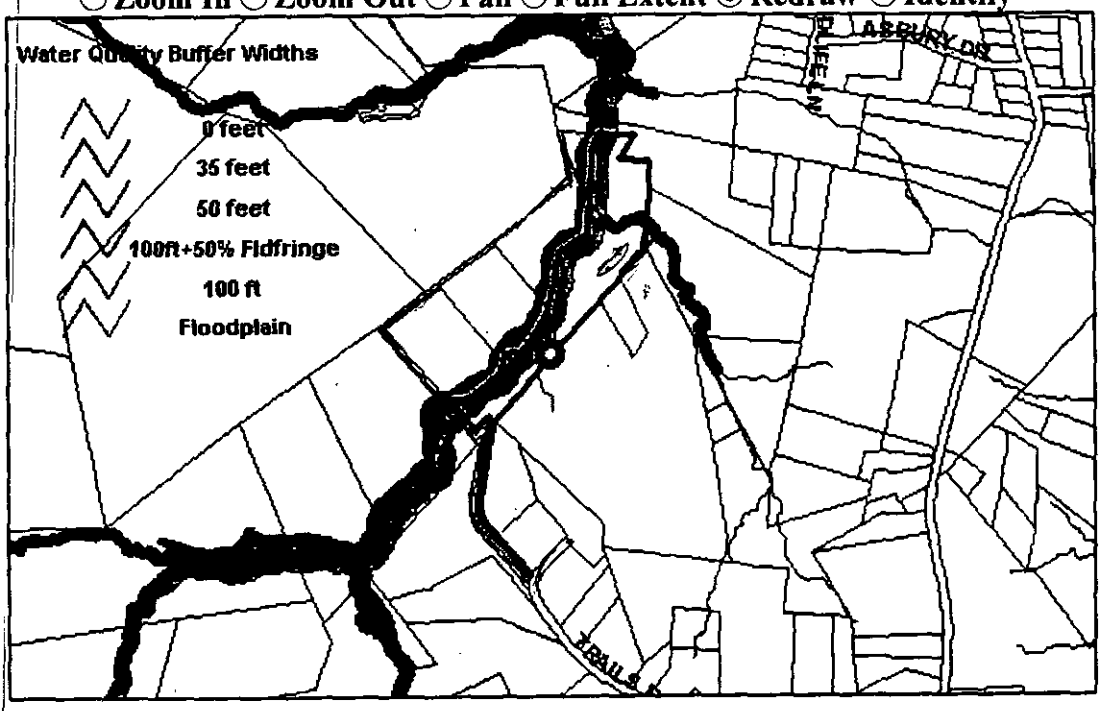
The undersigned further acknowledges that the proper design, construction, operation and maintenance of such septic tank system is the responsibility of the designer, owner, developer, installer, or user of the system, as applicable, and that neither the Department nor its officials, employees, or agents warrant or guarantee that the said system installed pursuant to the permit issued by the Department will function in a satisfactory manner for any given period of time or that the Department, its officials, employees or agents assume any liability for any damages of any kind which are caused, or which may be caused, by a malfunction of such system.

The undersigned further acknowledges that the following conditions will apply to the site:

- Any changes on the property may make the Improvement Permit Null and void and may make the Improvement Permit subject to revocation.

*This instrument was prepared by:* RAY MULLIGAN
*Mail after recording to:* 7218 Glenbrook Lane
Charlotte NC 28269

○ Zoom In ○ Zoom Out ○ Pan ○ Full Extent ◉ Redraw ○ Identify




parcel 01934108

Ray Mulligan
379-9110 (FAX) 632-9630

- large ck. 100 ft + 100yr. Floodplain
- small ck. 35 ft buffer

- 16 acres
- not subdividing
- building one house on lot
- located in Huntsville Zoning Area

- House footprint shown on survey
- All three zones shown on survey
-

ACS

**FEE:** 159 **AUTHORIZATION FOR WASTEWATER SYSTEM CONSTRUCTION**
**DATE:** 8/2/00 **VOID SIXTY (60) MONTHS FROM DATE OF ISSUANCE**

**DATE:** per call **PERMIT NO:** 4798-A
**PARCEL NO:** 019-171-19

**JOB LOCATION ADDRESS:** 11745 Trails End Lane
**PROPERTY OWNER:** Ray Mulligan
**BUILDING CONTRACTOR:**
**SUBDIVISION NAME:**
**AUTHORIZATION ISSUED BY:** Kell Rile **DATE:** 8-10-0
DEHNR AUTHORIZED AGENT

## AUTHORIZATION CONDITIONS

1. WASTEWATER SYSTEM CONSTRUCTION AND INSTALLATION MUST MEET ALL CONDITIONS AND SPECIFICATIONS AS SET FORTH IN IMPROVEMENT PERMIT NO. 4798-A, AND THE ATTACHED SITE PLAN WITH SYSTEM DETAILS. CONSTRUCTION AND INSTALLATION MUST ALSO MEET ALL REQUIREMENTS SET FORTH IN THE RULES GOVERNING SANITARY SEWAGE COLLECTION, TREATMENT, AND DISPOSAL AND ANY OTHER APPLICABLE RULES AND LAWS.

2. AN INSTALLATION, CONSTRUCTION, ALTERATION AND/OR REPAIR APPROVAL MUST BE SECURED **PRIOR** TO INSTALLATION OF THE SEPTIC TANK SYSTEM. THE INSTALLER OF THE SYSTEM SHALL BE A REGISTERED SEPTIC TANK CONTRACTOR WITH MECKLENBURG COUNTY HEALTH DEPARTMENT.

3. ANY ALTERATION IN SITE OR SOIL CONDITIONS (INCLUDING LOCATION OF STRUCTURES AND APPURTENANCES) OR MODIFICATION IN USE, DESIGN WASTEWATER FLOW, OR WASTEWATER CHARACTERISTICS AS SPECIFIED IN THE ASSOCIATED IMPROVEMENT PERMIT AND APPLICATION, MAY SUBJECT THIS AUTHORIZATION AND ASSOCIATED PERMIT(S) TO REVOCATION.

4. OTHER CONDITIONS: certified operator required type IV system
- agreement forms must be executed and recorded prior to installation approval
- install w/ plans on file

## OWNER CERTIFICATION

I CERTIFY THAT THERE HAVE BEEN NO ALTERATIONS IN SITE OR SOIL CONDITIONS OR MODIFICATIONS TO FACILITY, WASTEWATER FLOW, OR WASTEWATER CHARACTERISTICS FROM THOSE SPECIFIED IN THE ORIGINAL APPLICATION OR ASSOCIATED IMPROVEMENT PERMIT UNLESS AUTHORIZED IN WRITING BY THE MECKLENBURG COUNTY HEALTH DEPARTMENT. I ALSO UNDERSTAND THAT ANY SUCH ALTERATIONS, MODIFICATIONS, OR FALSE INFORMATION ARE GROUNDS FOR REVOCATION OF PERMITS AND AUTHORIZATION TO CONSTRUCT.

X [signature] 8/2/00
SIGNATURE OF OWNER/OWNER'S REPRESENTATIVE DATE

Permit Number 4798-A

0-19-171-19

- The IMPROVEMENT PERMIT is subject to revocation if site plans or the intended use change. There is to be NO grading, filling or disturbance of the soil in the area of the septic tank system or repair area
- CONSTRUCTION AUTHORIZATION must be obtained prior to receiving a Building Permit. The Construction Authorization is NOT transferable. Do not clear, grade, fill or disturb soil prior to obtaining a Construction Authorization.
- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

| | | | |
|---|---|---|---|
| Basement | ___ Yes | ✓ No | ___ Partial Basement |
| Type Primary Wastewater System<br>Type (circle one):<br>I II III (IV) V VI | ___ Conventional<br>___ Prefabricated, permeable block panel system<br>___ Shallow Placed Conventional | ✓ Low Pressure Pipe<br>___ Large Diameter Pipe<br>___ Fill<br>___ Other | ___ Innovative or Experimental:<br>___ IWWS-93-1<br>___ IWWS-93-2<br>___ IWWS-94-1 |

| | | | |
|---|---|---|---|
| .125 Long-term acceptance rate | 480 Max gallons/day wastewater flow | 5120 Absorption Area (sq ft) | 5' Trench spacing (min. on centers) |
| yes Serviced by private well | 1500 Gallon septic tank | 1024 Total trench length (ft) | 13" Maximum trench depth (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions) |
| 4 Bedrooms in residence | 1000 Gallon pump tank | 10" Depth of stone | |

Any surface waters present: No Type: Minimum separation distance:

Site modifications required:

Additional Conditions:
- certified operator required type ~~II~~ system
- agreement forms must be executed and recorded prior to installation approval
- install w/ plans on file

| | | | |
|---|---|---|---|
| Repair Area System Type<br>Type (circle one):<br>I II III (IV) V VI | ___ Conventional<br>___ Prefabricated, permeable block panel system<br>___ Shallow Placed Conventional | ✓ Low Pressure Pipe<br>___ Large Diameter Pipe<br>___ Fill<br>___ Other | ___ Innovative or Experimental:<br>___ IWWS-93-1<br>___ IWWS-93-2<br>___ IWWS-94-1 |

| | | | |
|---|---|---|---|
| 5120 Absorption Area (Sq ft)<br>1024 Total Trench Length (Ft) | 60" Depth of Stone Trench | 5 Trench spacing (min. on centers) | 12" Maximum Trench Depth |

For existing system, enter the year originally installed:

The undersigned, an authorized agent of the MECKLENBURG COUNTY HEALTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. This approval is granted in accordance with the provisions of Laws and Rules For Sewage, Treatment and Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

- No work shall be conducted on the septic tank system until an Installation, Construction, Alteration and/or Repair Approval is granted by this Department
- This Improvement permit is transferable.

8-1-00
DEHNR Authorized Agent Date

8-2-00
Owner/Agent Signature Date

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR
SUITE 211
700 N. TRYON ST
CHARLOTTE, N.C. 28202
(704) 336-5102

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH,
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

FEE: 200.00

DATE: 5/8/00 Rev Call

APPLICATION FOR IMPROVEMENT PERMIT
FOR RESIDENTIAL SITE
INDIVIDUAL WATER AND WASTEWATER
SYSTEMS PROGRAM

[ ] CRT

TYPE APPLICATION: X NEW SYSTEM __ EXPANSION/ ALTERATION OF EXISTING SYSTEM __ REPAIR OF EXISTING SYSTEM

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT,
HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

FILE #: 4798A

PROPERTY INFORMATION (FROM ENGINEERING FORM) FOR JOB LOCATION:

TAX/PARCEL NUMBER: 019 171 19

STREET ADDRESS: 11745 TRAILS END LANE

SUBDIVISION OR MOBILE HOME PARK NAME:

LOT NUMBER:

TOWNSHIP (CHECK ONE):

__ 0 MECKLENBURG
__ 1 CHARLOTTE
__ 2 DAVIDSON
__ 3 CORNELIUS
__ 4 PINEVILLE
__ 5 MATTHEWS
X 6 HUNTERSVILLE
__ 7 MINT HILL

CLOSING DATE_____

TYPE OF BUILDING (CHECK ONE):

__ SINGLE MOBILE HOME(S)
__ DOUBLE WIDE (D)
X HOUSE (H)
__ MODULAR HOME (M)
__ MULTIPLE FAMILY (U)
__ OTHER (O)

HEATED SQUARE FOOTAGE: 4223

NUMBER OF BEDROOMS: 4 NUMBER OF OCCUPANTS: 7

FOUNDATION FOR RESIDENCE:

__ WITHOUT BASEMENT
__ ON SLAB
X CRAWL SPACE
__ WITH BASEMENT /PLUMBING
__ WITH BASEMENT /NO PLUMBING

IF EXPANSION/ALTERATION OF EXISTING SYSTEM, DESCRIBE THE PROPOSED BUILDING ADDITION:

WILL THERE BE A HOME BUSINESS IN THE RESIDENCE: __ YES X NO TYPE: _____

WATER SUPPLY (CHECK ONE):
__ COMMUNITY (C)
__ MUNICIPAL (M)
X PRIVATE WELL (P)
__ SHARED WELL (S)
__ OTHER 'SPRINGS' (O)

IF ANY OF THE FOLLOWING ARE LOCATED ON THE PROPERTY, PLEASE SHOW LOCATION ON PLAT:

BURIED CABLES, LANDFILLS, STUMPHOLES __ YES ✓ NO
EXISTING WASTEWATER SYSTEMS __ YES ✓ NO
EASTMENTS OR RIGHT-OF-WAYS ✓ YES __ NO
WELL, SPRINGS OR WATERLINES ✓ YES __ NO
DESIGNATED WETLANDS ✓ YES __ NO

PROPERTY OWNER:

NAME: MULLIGAN, RAYMOND, C
(LAST) (FIRST) (MI)

ADDRESS: 7218 GLENBROOK LANE

CITY: CHARLOTTE STATE: NC ZIP: 28269

DAYTIME PHONE: (704) 372-9110 New # 336 7351320

LEGAL AGENT FOR PROPERTY OWNER, IF APPLICABLE:

NAME:
(LAST) (FIRST) (MI)

DAYTIME PHONE: ( ) —

WHAT DATE WAS THE PROPERTY ORIGINALLY DEEDED AND RECORDED? 4/14/99

An Improvement Permit is subject to suspension or revocation if site plans or the intended use change or if information submitted in this application is falsified or changed. The undersigned, owner, or legal agent for the owner, of the property described above as the "Job Location" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the Mecklenburg County Health Department to enter onto the property for the purpose of processing this request.

SIGNED: Ray Mulligan DATE: 5/8/2000

MECKLENBURG COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR., SUITE 211, 700 N. TRYON ST., CHARLOTTE, N.C. 28202., (704) 336-5102

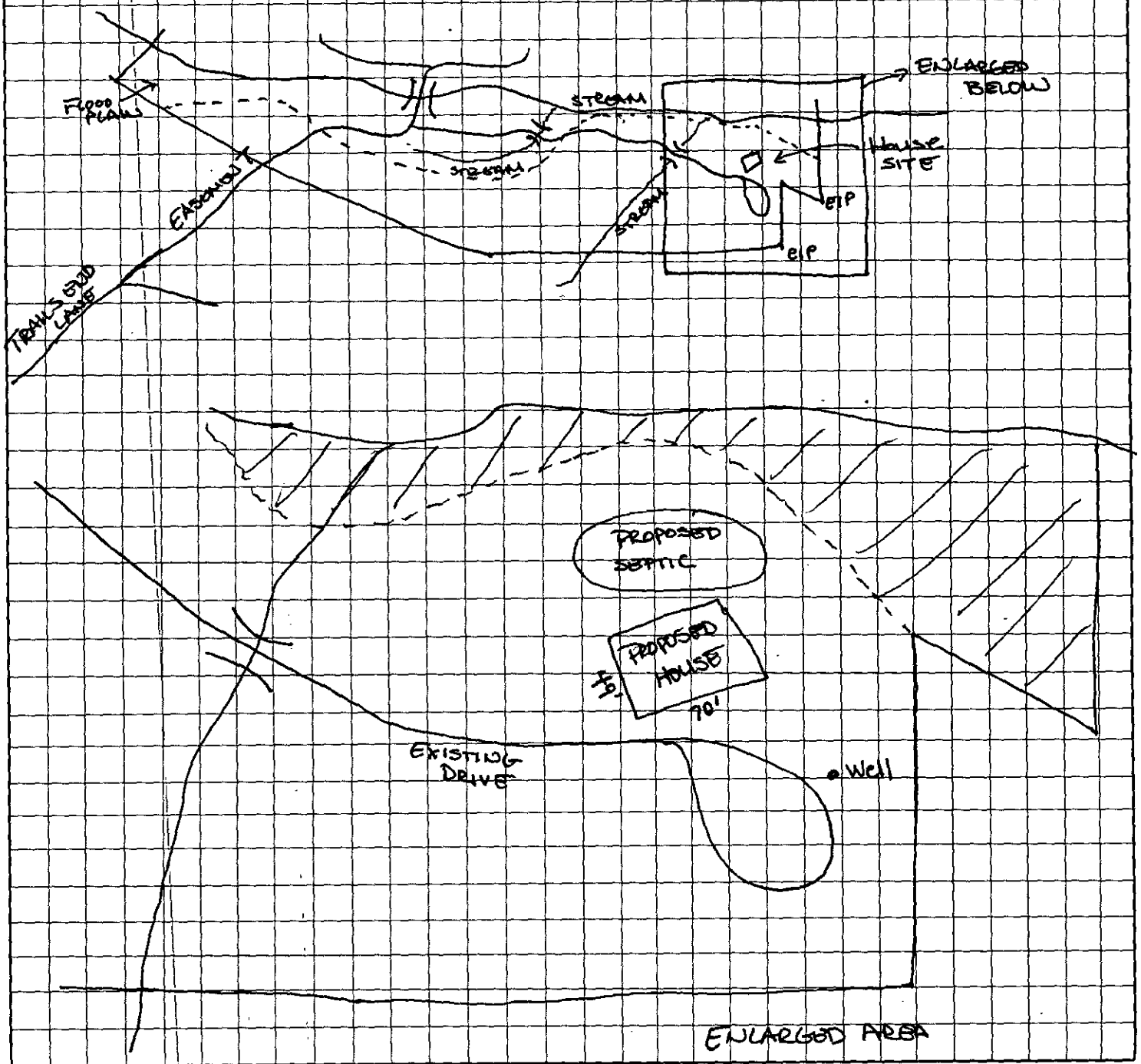
# PROPOSED PLOT PLAN

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON STREET
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 4798a

TC: 019-171-19

Draw in and name all roads adjoining the property. Draw in and accurately dimension the lot concerned. Accurately indicate property boundaries proposed and/or existing structures and driveways, underground utilities, and wells and springs within 100 feet of the proposed building or drainfield.




OWNER/AGENT SIGNATURE

DATE 5/8/00

APPROVAL DATE _____

White - Health Department's Copy  Canary - E.H.S. Copy  Pink - Owner's Copy

THIS IS A 16 ACRE TRACT AND MR. JAHUBISIN APPLIED TO BUILD A HOUSE IN 8/99. THE APPLICATION IN THE FILE IS FOR HIS PLANS. HE DECIDED NOT TO BUILD AFTER MEETING WITH JEFF KNIGHT.

MR. JAHUBISIN WAS IN THE OFFICE TODAY 5/5/00 TO PICK UP A BUILDING PERMIT FOR RAY MULLIGAN FOR THIS SAME PROPERTY. MR. MULLIGAN IS GOING TO BUILD AT A DIFFERENT LOCATION ON THE PROPERTY AND SO I GAVE MR. JAHUBISIN AN APPLICATION FOR MR. MULLIGAN TO FILE AND TOLD HIM WE WOULD HAVE TO CHECK HIS PROPOSED SITE.

JUDY
5/5/00

DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

Sheet: _____

#1 ACS Property ID: PO 019-341-06

Lot #: _____

File #: 4798A

# SOIL/SITE EVALUATION
## *for* ON-SITE WASTEWATER SYSTEM

OWNER: Ray Mulligan APPLICANT: Chuck Jakubisin

ADDRESS: 7216 Glenbrook Dr., Charlotte DATE EVALUATED: 9-27-99

PROPOSED FACILITY: residence PROPOSED DESIGN FLOW (.1949) 600 gpd PROPERTY SIZE: _____

LOCATION OF SITE: Trails End Lane PROPERTY RECORDED: _____

WATER SUPPLY: ☒Private ☐Public ☐Well ☐Spring ☐Other _____

EVALUATION METHOD: ☐Augur Boring ☒Pit ☐Cut

TYPE OF WASTEWATER: ☒Sewage ☐Industrial Process ☐Mixed

| PROFILE # | .1940 Landscape Position/ Slope % (Slopes 6-12%) | Horizon Depth (IN.) | SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE | .1941 CONSISTENCE MINERALOGY | OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR | .1943 SOIL DEPTH | .1956 SAPRO CLASS | .1944 RESTR HORIZ | PROFILE CLASS &LTAR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | LS | 0-3" | gr/L | VFr/SEXP/NS/NP | 7.5YR 7/1 TO Soil Wetness | 47" | N/A | None | PS III .39gpd/ft² |
| | | 3-33" | gr/SL | VFr/SEXP/NS/NP | | | | | |
| | | 33-47" | SBK/scl | Fr/SEXP/SS/SP | | | | | |
| 2 | LS | 0-14" | gr/SL | VFr/SEXP/NS/NP | 2.5Y 6/2 @ 30" | 39" | N/A | None | US III .25gpd/ft² |
| | | 14-39" | SBK/SC | Fi/SEXP/SP | | | | | |
| 3 | LS | 0-34" | gr/SL | VFr/SEXP/NS/NP | 7.5YR TO Soil Wetness | 49" | N/A | None | PS III .45gpd/ft² |
| | | 3-41" | SBK/scl | Fr/SEXP/SS/SP | | | | | |
| | | 41-49" | SBK/SC | Fi/SEXP/SP | | | | | |
| 4 | LS | 0-3" | gr/SL | VFr/SEXP/NS/NP | 7.5YR TO Soil Wetness | 51" | N/A | None | PS III .5gpd/ft² |
| | | 3-51" | SBK/scl | Fr/SEXP/SS/SP | | | | | |
| 5 | LS | 0-3" | gr/SL | VFr/SEXP/NS/NP | 7.5YR TO Soil Wetness | 50" | N/A | None | PS .49gpd/ft² IV |
| | | 3-33" | SBK/scl | Fr/SEXP/SS/SP | | | | | |
| | | 33-50" | SBK/SC | Fi/SEXP/SP | | | | | |
| 6 | LS | 0-29" | gr/SL | VFr/SEXP/NS/NP | 7.5YR TO Soil Wetness | 49" | N/A | None | PS .57gpd/ft² III |
| | | 29-49" | SBK/scl | Fr/SEXP/SS/SP | | | | | |

| DESCRIPTION | INITIAL SYSTEM | REPAIR SYSTEM |
|---|---|---|
| Available Space (.1945) | | |
| System Type(s) | | |
| Site LTAR | | |

OTHER FACTORS (.1946): _____

SITE CLASSIFICATION (.1948): Provisionally Suitable

EVALUATED BY: W.A. Mauldin 9-27-99

OTHER(S) PRESENT: C. Jakubisin

FILE # 4796A

## COMMENTS

100% Repair

LANDSCAPE POSITION

R-RIDGE
S-SHOULDER SLOPE
L-LINEAR SLOPE
FS-FOOT SLOPE
N-NOSE SLOPE
H-HEAD SLOPE
CC-CONCLAVE SLOPE
CV-CONVEX SLOPE
T-TERRACE
FP-FLOOD PLAIN

| GROUP | TEXTURE | .1955 LTAR |
|---|---|---|
| I | S-SAND<br>LS-LOAMY SAND | 1.2-0.8 |
| II | SL-SANDY LOAM<br>L-LOAM | 0.8-0.6 |
| III | SI-SILT<br>SICL-SILTY CLAY LOAM<br>CL-CLAY LOAM<br>SCL-SANDY CLAY LOAM | 0.6-0.3 |
| IV | SC-SANDY CLAY<br>SIC-SILTY CLAY<br>O-ORGANIC | 0.4-0.1 |

CONSISTENCE

| MOIST | WET |
|---|---|
| VFR-VERY FRIABLE | NS-NON-STICKY |
| FR-FRIABLE | SS-SLIGHTLYSTICKY |
| FI-FIRM | S-STICKY |
| VFI-VERY FIRM | VS-VERY STICKY |
| EFI-EXTREMELY FIRM | NP-NON-PLASTIC |
| | SP-SLIGHTLYSTICKY |
| | P-PLASTIC |
| | VP-VERY PLASTIC |

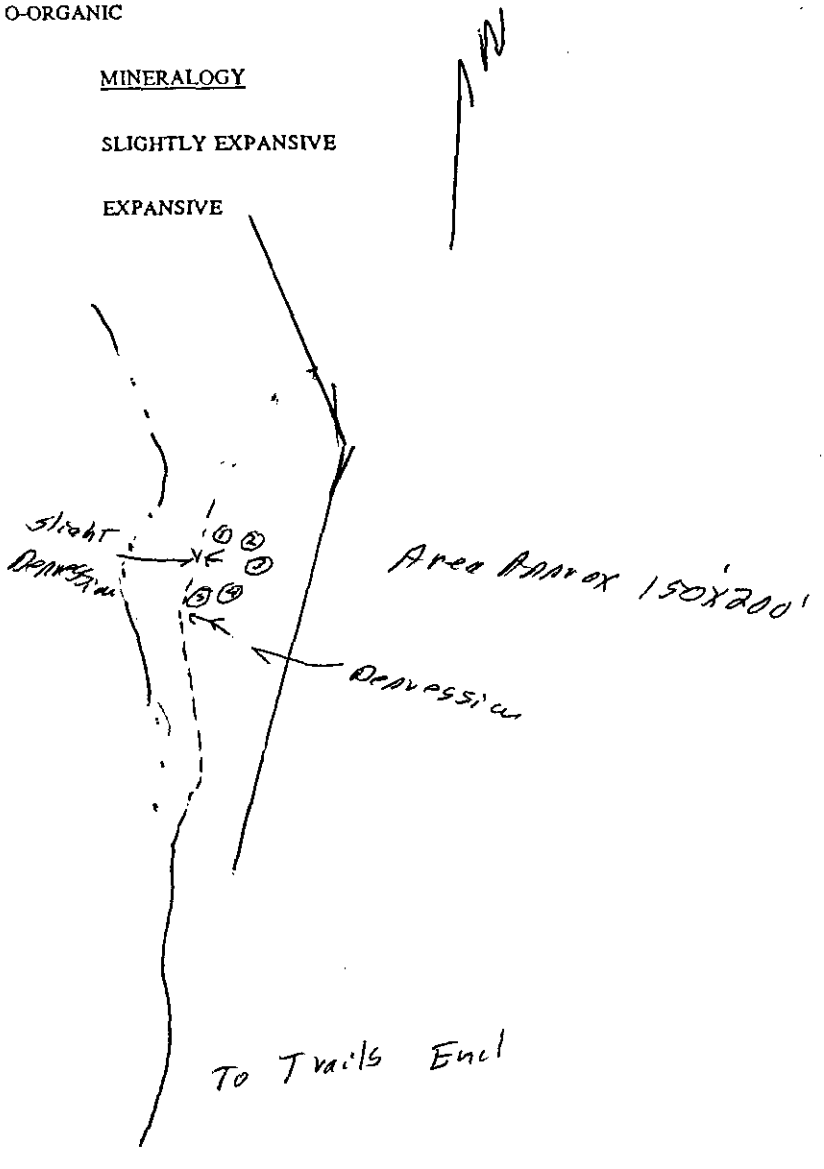
STRUCTURE

SG-SINGLE GRAIN
M-MASSIVE
CR-CRUMB
GR-GRANULAR
SBK-SUBANGULAR BLOCKY
ABK-ANGULAR BLOCKY
PL-PLATY
PR-PRISMATIC

MINERALOGY

SLIGHTLY EXPANSIVE

EXPANSIVE



Ray Mulligan
7218 Glenbrook Lane
Charlotte, NC 28269
(704) 379-9110

019-341-06 PP

**To:** Mr. William Martin
Mecklenburg County Health Department
Via Fax: (704) 336-6894

**From:** Ray Mulligan

**RE:** Tract 4 Cane Creek Forest Map Book 25 Page 912
File No. 4798.A

**Date:** Aug 24, 1999

Please perform a preliminary perk test on this property as requested by Mr. Jakubison, on the site which he has identified, the preliminary test noted in the file as [illegible] was performed on a different section of the same tract. I have asked Mr. Jakubison to perform this test, and you have my approval to proceed

Please do not hesitate to contact me if there are any questions at (704) 379-9110

Thank you for your assistance.

Ray Mulligan
Owner

FEE: $80.00 #4358
DATE: 8-20-99 MD

**APPLICATION FOR IMPROVEMENT PERMIT FOR RESIDENTIAL SITE INDIVIDUAL WATER AND WASTEWATER SYSTEMS PROGRAM**

[ ] CRT

TYPE APPLICATION: [X] NEW SYSTEM [ ] EXPANSION/ ALTERATION OF EXISTING SYSTEM [ ] REPAIR OF EXISTING SYSTEM

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT,
HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

FILE #: 4798A

PROPERTY INFORMATION (FROM ENGINEERING FORM) FOR JOB LOCATION:

TAX/PARCEL NUMBER: 01934106PO

STREET ADDRESS: [redacted] Trails End Lane

SUBDIVISION OR MOBILE HOME PARK NAME:

LOT NUMBER: 4108

TYPE OF BUILDING (CHECK ONE):

[ ] SINGLE MOBILE HOME(S)
[ ] DOUBLE WIDE (D)
[X] HOUSE (H)
[ ] MODULAR HOME (M)
[ ] MULTIPLE FAMILY (U)
[ ] OTHER (O)

HEATED SQUARE FOOTAGE: 2450

NUMBER OF BEDROOMS: 5 NUMBER OF OCCUPANTS: 9

FOUNDATION FOR RESIDENCE:

[ ] WITHOUT BASEMENT
[ ] ON SLAB
[ ] CRAWL SPACE
[X] WITH BASEMENT /PLUMBING
[ ] WITH BASEMENT /NO PLUMBING

TOWNSHIP (CHECK ONE):

[ ] 0 MECKLENBURG
[ ] 1 CHARLOTTE
[ ] 2 DAVIDSON
[ ] 3 CORNELIUS
[ ] 4 PINEVILLE
[ ] 5 MATTHEWS
[X] 6 HUNTERSVILLE
[ ] 7 MINT HILL

CLOSING DATE _____

IF EXPANSION/ALTERATION OF EXISTING SYSTEM, DESCRIBE THE PROPOSED BUILDING ADDITION:

WILL THERE BE A HOME BUSINESS IN THE RESIDENCE: [ ] YES [X] NO TYPE: _____

WATER SUPPLY (CHECK ONE):
[ ] COMMUNITY (C)
[ ] MUNICIPAL (M)
[X] PRIVATE WELL (P)
[ ] SHARED WELL (S)
[ ] OTHER 'SPRINGS' (O)

IF ANY OF THE FOLLOWING ARE LOCATED ON THE PROPERTY, PLEASE SHOW LOCATION ON PLAT:

BURIED CABLES, LANDFILLS, STUMPHOLES [ ] YES [X] NO
EXISTING WASTEWATER SYSTEMS [ ] YES [X] NO
EASTMENTS OR RIGHT-OF-WAYS [X] YES [ ] NO
WELL, SPRINGS OR WATERLINES [ ] YES [X] NO
DESIGNATED WETLANDS [ ] YES [X] NO

| PROPERTY OWNER: Ray Mulligan | LEGAL AGENT FOR PROPERTY OWNER, IF APPLICABLE: |
|---|---|
| NAME: Mulligan Ray (LAST) (FIRST) (MI) | NAME: Jakubisin Chuck J (LAST) (FIRST) (MI) |
| ADDRESS: 7218 Glenbrook Lane | DAYTIME PHONE: ( ) 361 - 5097 |
| CITY: Charlotte STATE: NC ZIP: 28269 | |
| DAYTIME PHONE: ( ) 597 - 5110 | |

WHAT DATE WAS THE PROPERTY ORIGINALLY DEEDED AND RECORDED? _____

An Improvement Permit is subject to suspension or revocation if site plans or the intended use change or if information submitted in this application is falsified or changed. The undersigned, owner, or legal agent for the owner, of the property described above as the "Job Location" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the Mecklenburg County Health Department to enter onto the property for the purpose of processing this request.

SIGNED: [signature] DATE: 8/20/99

MECKLENBURG COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR., SUITE 211, 700 N. TRYON ST., CHARLOTTE, N.C. 28202., (704) 336-5102

114

map book 25

page 912

tract 4

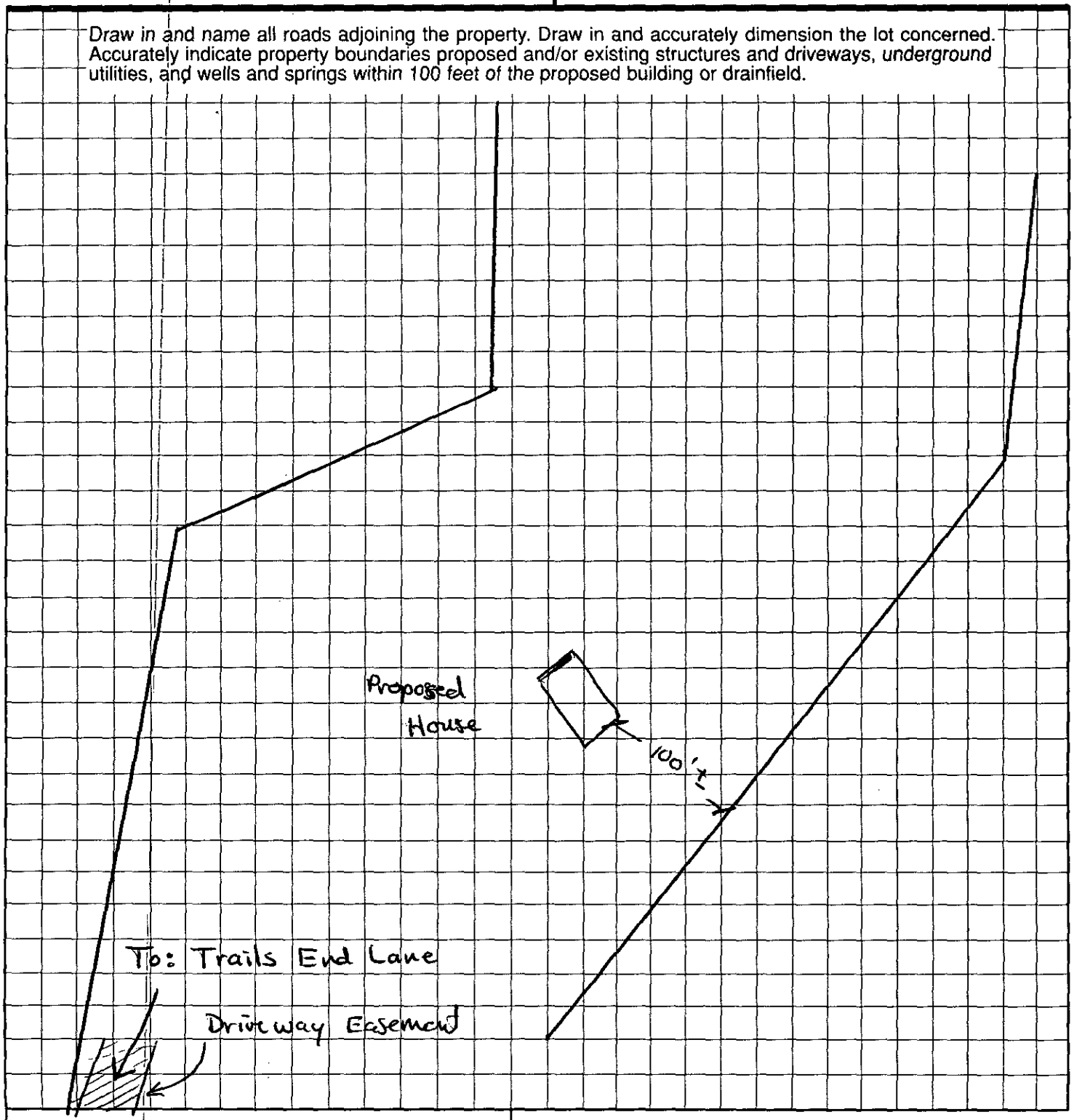
# PROPOSED PLOT PLAN

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON STREET
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 4798A

TC: 019-341-0680

Draw in and name all roads adjoining the property. Draw in and accurately dimension the lot concerned. Accurately indicate property boundaries proposed and/or existing structures and driveways, underground utilities, and wells and springs within 100 feet of the proposed building or drainfield.




Chuck Jakubsen
OWNER/AGENT SIGNATURE

DATE 8/20/99

APPROVAL DATE _____

White - Health Department's Copy  Canary - E.H.S. Copy  Pink - Owner's Copy

# Mecklenburg County
## Health Department

Basil G. Delta, M.D., M.P.H.
Health Director

August 19th, 1988

Guy O. Keller
3535 Randolph Road, Suite 200A
Charlotte, NC 28211

RE: Property located at Trails End Road 1
FILE: 4798A
PARCEL: 01917114 PO

Dear Sir:

At your request, a field investigation was conducted on the property designated above for the purpose of determining site suitability for the installation of a ground absorption sewage disposal system. Results of the investigation revealed that the lot contains soils which have been classified as PROVISIONALLY SUITABLE in accordance with the provisions of 10 NCAC 10A .1900. A copy of the Site Evaluation Report (Serial Number 15420) deliniating the soil types and their respective classifications is enclosed.

While this classification indicates the site is acceptable for the installation of a septic tank system, no specific system or plans have been approved. The area available for such an installation may impose limitations on the size and/or type construction permitted on the lot. Specific plan approval will be provided upon submission of an Application For An Improvement Permit with an ACCURATELY dimensioned plot plan detailing the location of current and/or proposed buildings, wells and sewage disposal systems and determination that the area is adequate to accomodate the proposed construction.

Please note that this classification may be revoked if any filling, grading or construction (including the drilling of a well) is performed on the lot which in the opinion of this Department renders any area previously designated suitable for system installation, unsuitable. Futhermore, this approval may be revoked should any changes occur in the regulations under which it was granted, if such changes would have prevented its approval had they been in effect on the date of issuance.

If there are any questions concerning this matter, do not hesitate to contact me.

Very truly yours,

Sylvia D. Daniel

Sylvia D. Daniel, R.S., Supervisor
On Premises Waste Disposal & Water Supply

Enclosure

MECKLENBURG COUNTY ENVIRONMENTAL HEALTH
SITE EVALUATION REPORT
SERIAL NUMBER 15420

File: 4798A Action 4

Parcel: 01917114 PO ☐ PC

Location: Trails End Road

Subdivision:

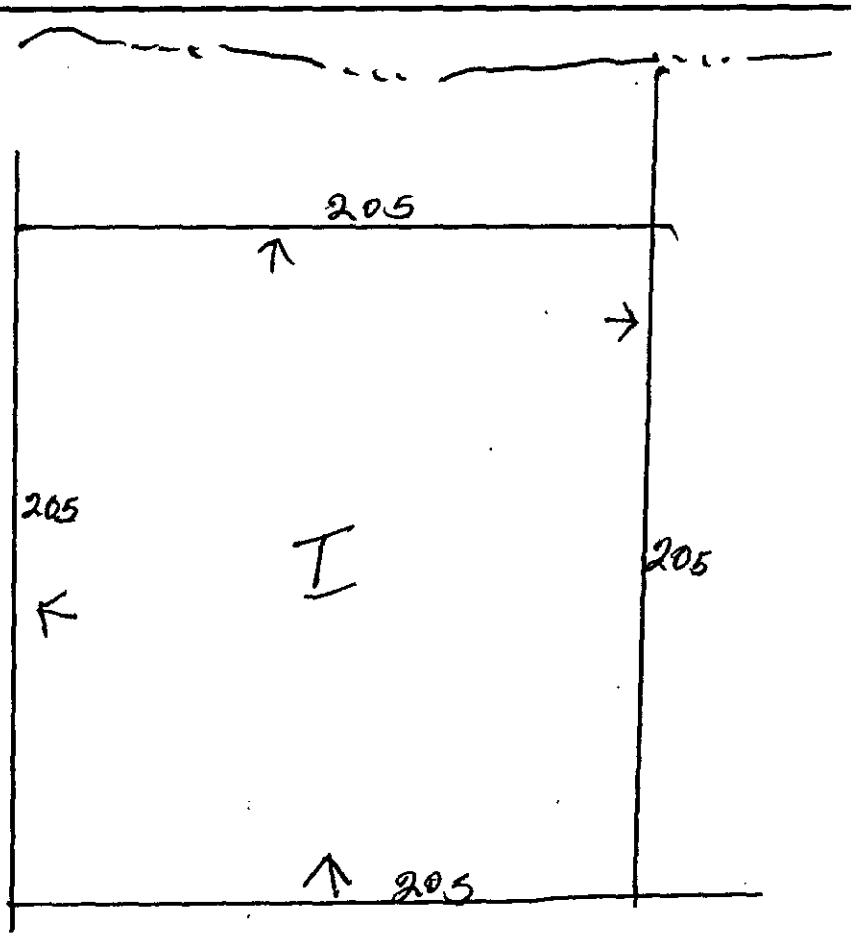
Lot: 1 Block: Acres: 1

Owner: Guy O. Keller
Address: 3535 Randolph Road, Suite 200A
Charlotte, NC 28211

Comments: Off Trails End Rd - 1A of 13A Tract. Site Marked with White 2XH Keep Topo Map

Described by: W. B. Ramsey

Date: 8-19-88



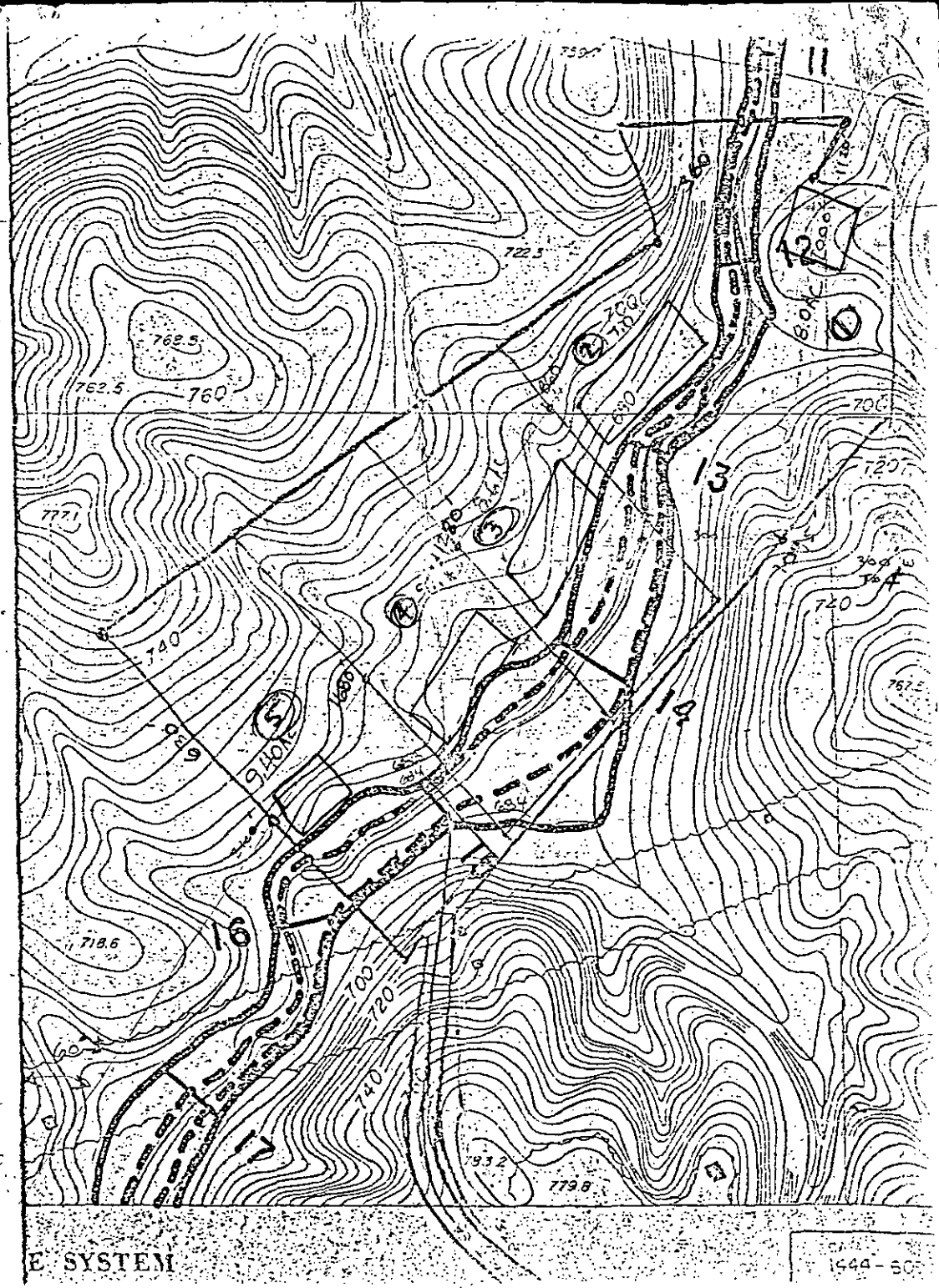

*** EVALUATION KEY ***

S = Suitable U = Unsuitable
PS = Provisionally Suitable
The "Area Classification" below indicates the suitability of areas in the diagram.

| FACTORS | AREA 1 | AREA 2 | AREA 3 | AREA 4 | AREA 5 | AREA 6 |
|---|---|---|---|---|---|---|
| Topography | S (PS) U 2-7 | S PS U | S PS U | S PS U | S PS U | S PS U |
| Texture | S (PS) U | S PS U | S PS U | S PS U | S PS U | S PS U |
| Structure | S (PS) U | S PS U | S PS U | S PS U | S PS U | S PS U |
| Drainage | S (PS) U | S PS U | S PS U | S PS U | S PS U | S PS U |
| Depth | S (PS) U 36-40 | S PS U | S PS U | S PS U | S PS U | S PS U |
| Restrictive Horizons | S (PS) U | S PS U | S PS U | S PS U | S PS U | S PS U |
| Available Space | S (PS) U | S PS U | S PS U | S PS U | S PS U | S PS U |
| Other (specify) | S PS U | S PS U | S PS U | S PS U | S PS U | S PS U |
| Soil Group/Series | TfA Appling Like | | | | | |
| Area Classification | S (PS) U | S PS U | S PS U | S PS U | S PS U | S PS U |

SEC 15 - REG FLOOD DISCHARGE
1460 ft³/sec = 655,300 GPM

FLOOD PROTECTING ELEV - 685.6




E SYSTEM

1449-50

7/25/88 Pd 30 - CK# 2444 JK

# APPLICATION FOR SOIL INVESTIGATION

MECKLENBURG COUNTY ENVIRONMENTAL HEALTH

1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 376-4603

(OFFICE USE ONLY)

FILE: 4798A

TC: 019 171 14

☐ PC ☐ REPT

**JOB LOCATION**

① ADDRESS: 11743 TRAILS END RD

② SUBDIVISION: CANE CREEK ESTATES ③ LOT: 1 ④ BLOCK: _____

⑤ PARCEL REFERENCE: BOOK NO.: _____ PAGE NO.: _____ PARCEL NO.: _____

⑥ DEED REFERENCE: BOOK NO.: _____ PAGE NO.: _____

**OWNER**

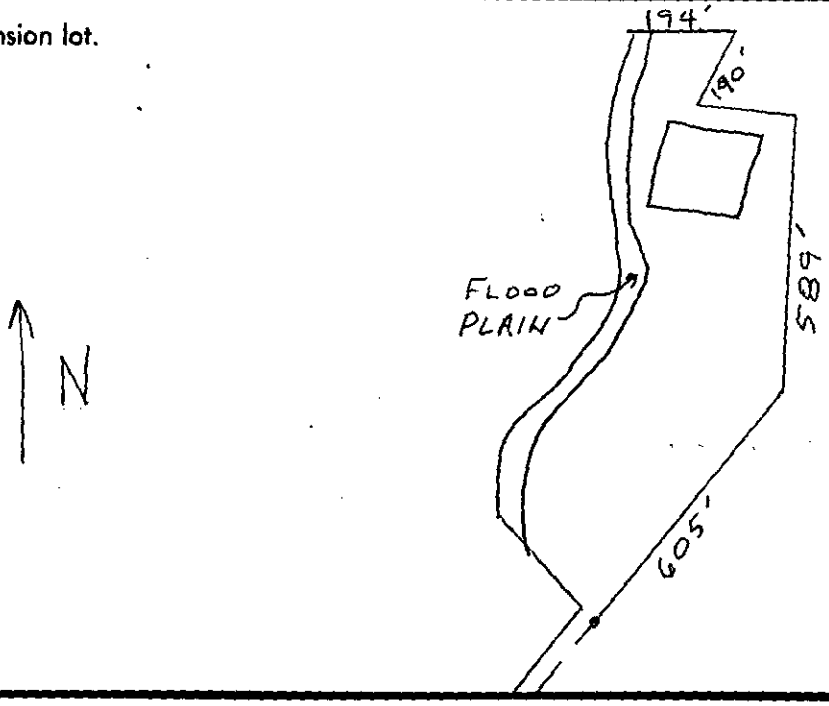
⑦ NAME: Guy (FIRST) O. (MIDDLE) Keller (LAST)

⑧ MAILING ADDRESS: 3535 Randolph Road Suite 200A

⑨ CITY: Charlotte ⑩ STATE: N. C. ⑪ ZIP: 28211

⑫ PHONE: (WORK) (704) 364-2500 (HOME) (704) 529-1772

⑬ Accurately diagram and dimension lot.




1" = 400'

SEE ATTACHED MAP

⑭ The undersigned, owner of the property described above as the "JOB LOCATION" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the MECKLENBURG COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH to enter onto the property for the purpose of processing this request.

Signed: ✓ Guy O. Keller

Mecklenburg County services are available without regard to ethnic origin, sex, or disability.

Date: July 12, 1988

WHITE - ENVIRONMENTAL HEALTH DEPARTMENT'S COPY ● CANARY - ENVIRONMENTALIST'S COPY ● PINK - OWNER'S COPY