TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES

PERMIT FOR CONSTRUCTION OF SUBSURFACE SEWAGE DISPOSAL SYSTEM

Issued to: Cooper Frank
Owner, Developer, Contractor, Installer, Etc.

Location:
Hutoha Dr
Crossville , TN 38572-
County: Cumberland
Map/Group: 149B-B Parcel: 1
Subdivision: Dakota
Lot: 93

Installation:
(x) 1. New Installation
( ) 2. Repair to Existing System
( ) 3. System Modification

Establishment:
(x) 1. Residential: # Bedrooms 2
( ) 2. Other: _____

Gal/Day 0

Evaluation Based Upon:
(x) 1. Soil Typing by Soil Scientist
( ) a. General
( ) b. High Intensity
(x) c. Extra High Intensity
( ) 2. Soil Percolation Test
( ) 3. Environmental Specialist
Estimated Absorption Rate: 30 MPI

Type of System:
( ) 1. Conventional
( ) 2. Modified Conventional
( ) 3. Conventional System Substitute
( ) Chamber
( ) Expanded Polystyrene
( ) Large Diameter Gravelless Pipe
Gravel backfill in a 24" wide trench required? _____
(x) 4. Low Pressure Pipe
( ) 5. Mound
( ) 6. Lagoon
( ) 7. Subsurface Drip System
( ) 8. Other

Approval Based Upon: State No. T.C.A. 68-221-403
( ) (c) Percolation Test
( ) (d) Grandfather clause - Current standards except those specified
( ) (f) 12" (karst) and 6" (non-karst) buffer required
( ) (i) 9" buffer required (24"-36" total soil depth)
( ) (k) Grandfather clause - meets June 30, 1990 standards (repair only)
(x) Current Standards
( ) Other: _____

This system shall consist of a two compartment septic tank holding 750 gallons, with 180 linear feet in 4 trenches, 12 inches wide and 18 (min) to 18 (max) inches deep. (Depth of gravel: 9 inches)

General Comments: For questions and final inspection call 931-520-6688

Also required:
( ) 1. Soil Improvement Practice (SIP)
( ) Curtain Drain
( ) Drawdown Drain
( ) Interceptor Drain
( ) 2. Flow Diversion Valve
(x) 3. Sewage Pump
( ) Pump Flow Rate (gpm) 20
( ) TDH (ft) 17
( ) 4. Other:

All installers of subsurface sewage disposal systems must hold a valid annual license from the Tennessee Department of Environment and Conservation.

Please see attached drawing and supporting documentation.

The recipient of this permit agrees to construct or have constructed the above described system in accordance with T.C.A. 68-221-401 et. seq. and The Regulations To Govern Subsurface Sewage Disposal Systems. If any part of the system is covered before inspected and approved, it shall be uncovered by the recipient of the permit at the direction of personnel of the Department of Environment and Conservation. **Any cutting, filling or alterations of the soil conditions on the aforementioned property after this day may render this approval null and void.**

By Angelle Conatser EPSCII & Brian Houston Env. Con. 3 Date 10/31/2023
(Date of issue)

This is a permit to construct and is not intended to imply approval of any work proposed or completed on this lot.

CN-0762 (Rev 12/93)

This permit is valid for 3 years from date of issue.

RDA 2403

Tennessee Department of Environment and Conservation - Division of Water Resources

Permit for Construction of a Subsurface Sewage Disposal System

Issued To: Frank Cooper

Location: Hutoha Dr
Crossville, TN 38572
Dakota Lot 93
149B B 001.00

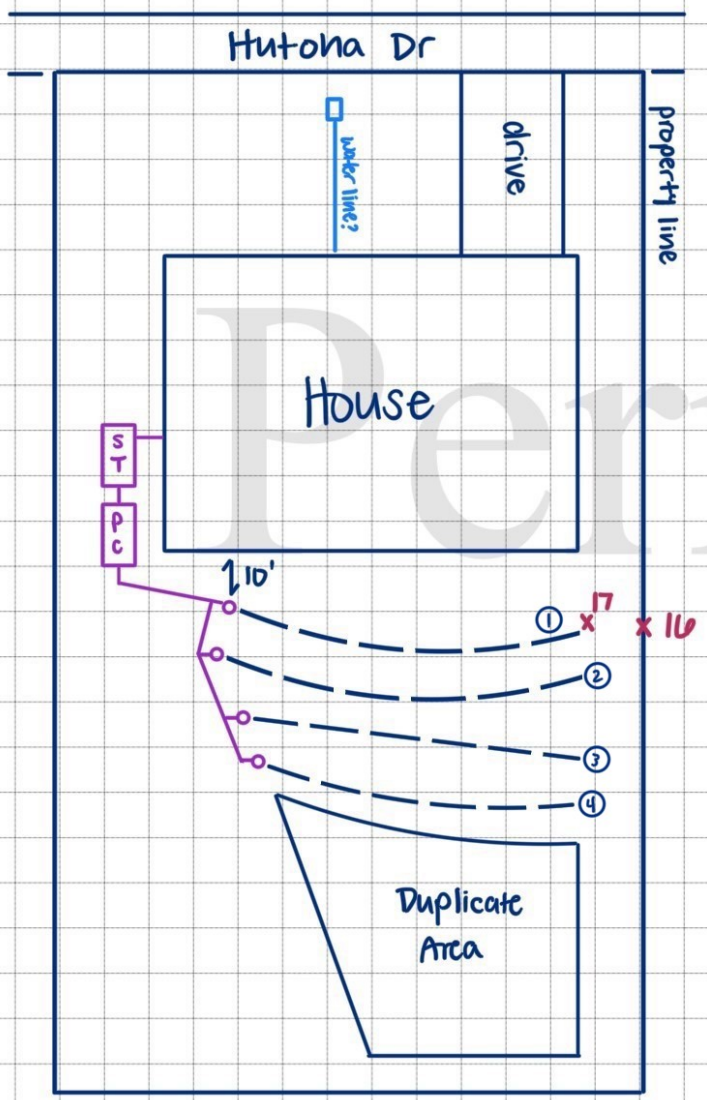
DESIGN REVIEW:
Inspector: Brian Hunter ENV. CON. 3

Date: 10/31/23 Shyrelle Conatser EPSC II

General Notes:

- Please refer to the design specifications for the subsurface sewage disposal system on the first page of the construction permit.
- Contact the local Division of Water Resources representative to schedule a final inspection.
- All electric components (e.g., pump, alarm, etc.) for the subsurface sewage disposal system must be inspected and approved by the appropriate electrical inspector prior to requesting a final inspection. Documentation of the electrical inspection must be available during the final inspection.

2 Bedroom – Modified Low Pressure Pipe



- Keep tanks 5' from house.
- Keep field lines 10' from house, property lines, and utilities.
- protect and reserve duplicate area.

* see attached pages for MLPP design notes.

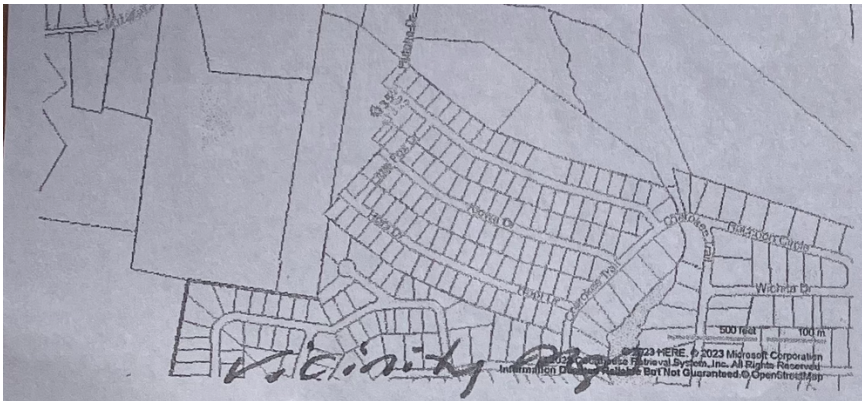
* 24 cubic yards of suitable top soil.
* House MUST be 10' from flagged latteral lines.

Flagged Lines:

1.) orange - 43 ft
2.) lime - 46 ft
3.) pink - 47 ft
4.) yellow - 44 ft

180 ft
total length
@ 18" only

*Not to Scale



Vicinity Map

- This soil map is to evaluate the site for a subsurface sewage disposal system only
- Signature of the Soil Consultant does not constitute approval of this map by the Division of Water Resources
- I Andy Brown or Doug Davis affirm that this soil map meets the standards established in the Regulations to Govern Subsurface Sewage Disposal, the Soils Handbook, and the Soils Taxonomy. No other warranties are made or implied

L1	Orange	43 ft
L2	Lime	46 ft
L3	Pink	47 ft
L4	Yellow	44 ft

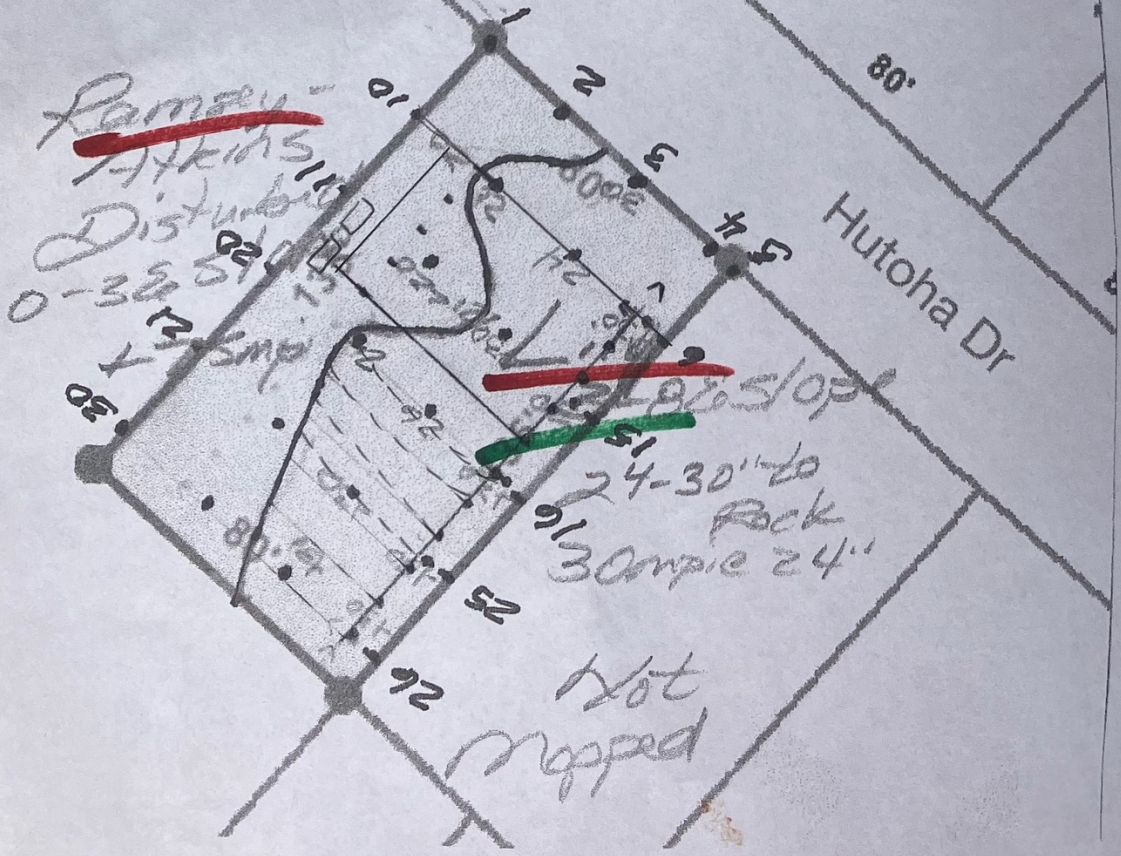
180 ft

35.88257
-85.08270

el 10ft
tl 35ft

Siphon break

1" laterals



NAME: Frank Cooper
LOCATION: Lake Tansi - *Dakota Lot 93* - *Hutoha Dr*
GPS LOCATION: *35.88257 -85.08270*
PARCEL #: *149B B 001.00*

This system is to consist of a two-compartment septic tank, dosing system and a pressure distribution disposal field. All materials and the placement of these materials shall be in strict compliance with these plans. No construction shall begin until the soil is adequately dry which shall be determined by this office.

Soil Permeability Rate	**30 Minutes Per Inch**
Slope	**3-8%**
Loading	**300 GPD @ .35gpd/ft²**
Depth to Restrictive Layer	**24 Inches**

AREA REQUIRED: Loading **(300 GPD)** / Absorption factor for **(30 MPI)** soil **(0.35 GPD/Sq Ft)** = **860 Sq Ft**

LINEAR FEET: Absorption Area Required **(860 Sq Ft)** / 5 ft (Distance Between Trenches) = **Install 180ft**

DISTRIBUTION SYSTEM:

Hole Spacing	**5 Feet**	Lateral Length	**1 @ 43ft, 1 @ 44ft, 1 @ 46ft, 1 @ 47ft**
Hole Diameter	**5/32 Inch**	Lateral Diameter	**1 inch**
Manifold Length	**35 Feet**	Trench Width	**12 Inches**
Manifold Diameter	**2 Inches**	Distance Between Laterals	**5 Feet**

DISTRIBUTION SYTEM: Total Footage **(180ft)** / Hole Spacing **(5ft)** = **36 Holes**
Lateral Length **(43ft)** / Hole Spacing **(5ft)** = **8 Holes**
Lateral Length **(44ft)** / Hole Spacing **(5ft)** = **8 Holes**
Lateral Length **(46ft)** / Hole Spacing **(5ft)** = **9 Holes**
Lateral Length **(47ft)** / Hole Spacing **(5ft)** = **9 Holes**

(34 Holes) x **.5** (gpm flow through **5/32 inch** hole at **3 ft** of pressure head) = **18 GPM**
Siphon Break needed: 18 GPM + 2 GPM = **20 GPM**

PUMP HEAD: Elevation Head + 5 Feet (tank depth) = **10 Feet**
Friction Loss (**2 Inch** diameter pipe) = 35/100ft x .84ft = 0.294ft x 1.2 (fittings loss) = **1 Feet**
Pressure Head = **3 Feet**

Total Dynamic Head (TDH) = **10 Feet** + **1 Feet** + **3 Feet** = 14 Feet

ADD 20% SAFETY FACTOR: The pump shall have a minimum capacity of **20 GPM** against a TDH of **17 Feet**.

DOSE DATA: Manifold Volume (Vsupply) = **35 Feet** x **17.4 Gal/100 Feet** = **6.1 Gallons**

Lateral Volume (Vlat) = **180 Feet x 4.5 gal/100ft** = **8.1 Gallons**

Dosing Volume (Vdose) Minimum Dose = Vsupply + 5(Vlat) = **6.1 Gallons** + 5(**8.1 Gallons)** = **46.6 Gallons**

Design Dosing Volume (2 doses per day) = Loading (**300 GPD**) / **2** doses per day = **150 gals**

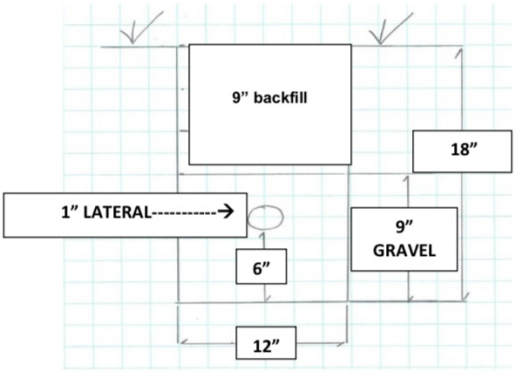
The run time for the pump for each dose will be about 7.5 minutes if a 20 GPM pump is installed.

Check Valve Calculations (Cv) = **6.1 Gallons** + **8.1 Gallons** = **14.2 gals** (**NO CHECK VALVE IS REQUIRED)**

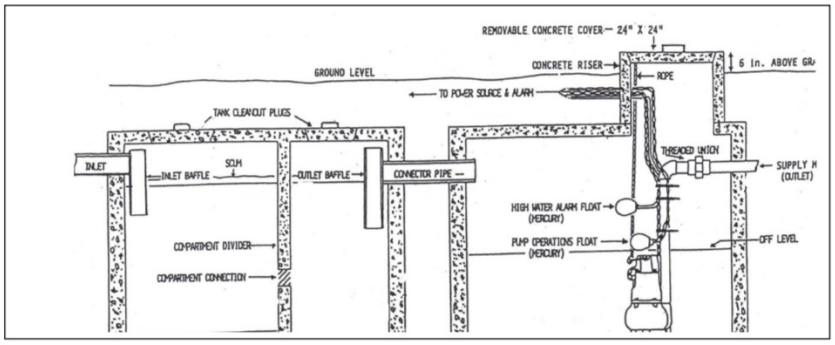
INSTALLATION NOTES

- **THIS PERMIT REFLECTS THE PRELIMINARY LAY OUT OF THE PROPOSED MODIFIED LOW PRESSURE PIPE SEWAGE DISPOSAL SYSTEM. AFTER THE LOT IS CLEARED CONTACT DWR AND THE LATERALS WILL BE MARKED IN THE FIELD AND THE LAY OUT REVISED IF NECESSARY.**
- This permit is for a two-bedroom modified low pressure pipe (MLPP) sewage disposal system to serve a structure without a basement or basement plumbing.
- **A COPY OF THIS PERMIT SHOULD BE ON SITE DURING THE INSTALLATION OF THE MLPP AND WHEN THE FINAL INSPECTION IS MADE.**
- **THE INSTALLER MUST POSSESS AN ACTIVE LICENSE TO INSTALL LOW PRESSURE PIPE SEWAGE DISPOSAL SYSTEMS.**
- Install the structure as shown on the permit/site sketch. Structure must be 10ft from flagged laterals.
- The structure, drive and utilities must not encroach into the area set aside to install and duplicate the MLPP.
- All utilities must be located along the property lines.
- **THE ELECTRICAL INSPECTOR MUST APPROVE THE PUMP AND WIRING CONNECTIONS BEFORE THE FINAL INSPECTION CAN BE MADE. THE ELECTRICAL INSPECTOR'S BLUE STICKER MUST BE IN PLACE BEFORE THE FINAL INSPECTION CAN BE MADE.**

- **USE THE ATTACHED EXTRA HIGH INTENSITY SOIL MAP TO LOCATE AND INSTALL THE MLPP LATERALS IN THE SUITABL SOIL AREA. THE LATERALS MUST BE INSTALLED IN THE Lily SOIL UNIT SHOWN ON THE ATTACHED SOIL MAP.**
- **ANY UNAUTHORIZED CUTTING/FILLING OF THE AREA SET ASIDE TO INSTALL AND DUPLICATE THE MLPP WILL VOID THIS PERMIT AND MAY REDUCE THE NUMBER OF BEDROOMS FOR WHICH A PERMIT MAY BE ISSUED.**
- **AVOID BURNING BRUSH OVER THE AREA SET ASIDE TO INSTALL AND DUPLICATE THE MLPP.**
- **AVOID USING THE AREA SET ASIDE TO ISNTALL AND DUPLICATE THE MLPP FOR PARKING OR STAGING BUILDING MATERIALS.**
- Disc 6" of topsoil ***(24 cubic yards)*** into the area where the MLPP laterals will be installed prior to installation of the MLPP laterals.
- **The laterals must be installed at or near the flagged locations. (lateral #1 – Orange-43ft, lateral #2 – Lime-46ft, lateral #3 – Pink-47ft, lateral #4 – Yellow-44ft)**



- **DO NOT EXCEED AN 18" TRENCH DEPTH. Measure the MLPP trench depth on the down slope side of the trench.**
- Install the laterals as shown in the cross-section of a modified LPP trench.
- Absorption Trench Aggregate: The gravel in the trench shall be washed and without fines and shall range in size from ¾ inch to 1 inch. Rock **shall not** be placed in the manifold trench.
- Install the laterals 10ft from water line, property lines and other utilities.
- Install the laterals 25ft from cut banks.
- Install the laterals 50ft from any well.



- The pump must supply 20 GPM at 17' TDH.
- The pump chamber must have a minimum volume of **750 gallons** and be single compartment.
- **Rule 0400-48-01-.12 (2)(g)3:** *The pump control must be positioned so the "pump off" switch is slightly above the top of the pump and the "pump on" switch is at the desired dosing depth. The "pump off" switch for pumps specifically designed to operate with the pump motor casing exposed to air, may be located at a lower elevation provided an adequate depth of wastewater is maintained above the pump intake to insure that the pump intake will not draw in air.*

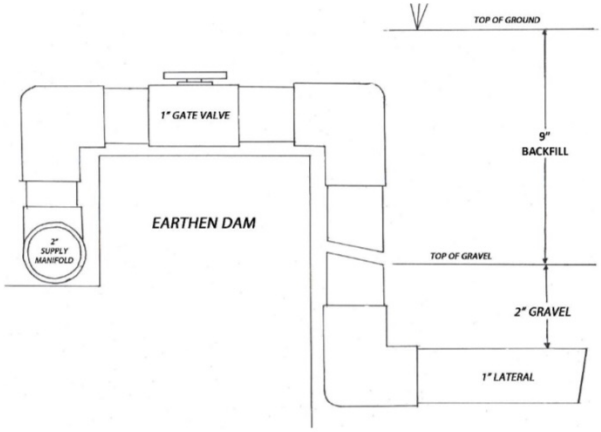
- Set the pump float to deliver about 150 gallons per dose.
- **The pump run time for each dose will be about 7.5 minutes if a 20 GPM pump is installed.**
- The pump chamber must be full of water so the pressure head can be set.
- The septic tank and pump chamber sizes and manufacturer must be visible when the final inspection is made.
- Install the septic tank and pump chamber 10ft from water line, property lines and other utilities.
- Install the septic tank and pump chamber 15ft from natural drains and cut banks.
- Install the septic tank and pump chamber 50ft from any well.

- Pipe Materials: All pipe, both gravity and pressure, to and through the distribution system shall have a minimum equivalent strength of Schedule 40 PVC and equipped with pressure fittings.

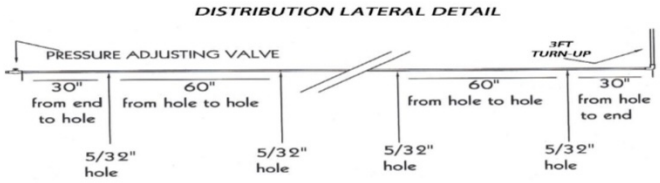
- The wiring must be inspected an approved by the electrical inspector before the final inspection will be made. The blue sticker must be on the box where the wiring connections are made.

- Install the supply line as shown on the permit/site sketch. Consider sleeving the supply line under the drive in the event maintenance is needed at a later date.

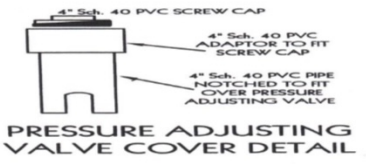
- If the supply line from the pump chamber must cross any water line, make the crossing in accordance to:
  Rule 0400-48-01-.07(4)(y): *Water lines shall not cross, pass through, or go under the subsurface sewage disposal field. Water lines may cross, but not be located in the same trench with, a tight line leading from a septic tank or dosing tank to a disposal field provided the water line is sleeved in a continuous twenty (20) feet section of Schedule 40 PVC pipe or equivalent (a minimum of ten (10) feet on either side of the tight line) and the water line is a minimum of one (1) foot vertically above the tight line.*



- Make the supply manifold to lateral connections as shown in the diagram above.



- Use the previous diagram to properly space the holes in each lateral.



- Use the above diagram as a guide to construct covers for the gate valves.

- Divert all gutter downspouts away from the septic system.

- Conserve water to reduce the risk of overloading the new field lines.

Modified LPP Construction Techniques

- Check the moisture content of the soil at 12-inch depth. If it is too wet, smearing and compaction will occur, reducing the absorption capacity of the soils. Soil moisture content will be determined by a soil scientist or environmentalist. **DO NOT BEGIN CONSTRUCTION IF SOILS ARE DETERMINED TO BE TOO MOIST!**

- If necessary, cut trees to ground level and remove excess vegetation by mowing. Prepare the site by plowing the site perpendicular to slope (on contour). A roto tiller may be used in **dry conditions only.** Avoid cutting of plowed area with vehicular traffic.

- Place properly selected topsoil fill around the edge of the plowed area. **KEEP TRUCK AND TRACTOR WHEELS OFF THE PLOWED AREA!**

- Move the fill material into place using a small track-type tractor with a blade. Evenly spread six inches of fill over entire plowed area and incorporate into the plowed layer. With the blade, smooth the plowed area of large clumps of soil and depressions.

- Dig and lay the supply line and manifold pipe from the pump chamber to the lateral site.
- Dig the laterals on contour as designed.
- Assemble the lateral pipes and drill the holes with the correct hole diameter and proper spacing.
- Lay lateral lines on 6" supports spaced at a maximum of twenty (20) feet intervals and connect to the manifold with holes facing toward the bottom of the trench. Holes should not be located over lateral supports.
- Set turn-ups on the end of each line. The lengths of the turn-ups should be equal to the designed pressure head of the individual lateral.
- Adjust pump floats to desired spacing to achieve designed dosing volume.
- Pressure test system. Adjust pressure head with gate valves until water barely flows over the ends of the turn-ups.
- Check for and repair any leaks.
- Check all holes and make sure water flows out of them evenly.
- Cut off turn-ups to desired height (just below grade level), and install end caps.
- Add ***9"*** of gravel (clean) to the trenches (***6"*** below the pipe and ***2"*** above the lateral pipe).
- Cover the trench aggregate with paper.
- Backfill the system with a blade carefully, taking care not to hit any part of the system with the blade or tracks.
- Landscape the site by planting grass and straw sufficiently to prevent erosion of the plowed area.

Low-pressure pipe system maintenance involves pumping the septic tank every three years to avoid carry –over of solids into the laterals. A good water conservation plan within the house assures the system will not be overloaded. Avoid excess heavy traffic in the LPP system area. Winter traffic over the area should be minimized.

SUPPLIES AND EQUIPMENT

TYPE	SIZE	QUANTITY	DESCRIPTION
Pipe, Schedule 40	**2 IN**	**35ft**	Supply Manifold
Pipe, Schedule 40	**1 IN**	**192ft**	Laterals and Turn-ups
Tee	**2x2x1 IN**	**3**	Supply to Laterals
Elbow	**2x1 IN**	**1**	Supply to Laterals
Elbow	**1 IN**	**4**	Turn-ups
Elbow	**2 IN**	**as needed**	Supply Manifold
Male Adapter	**1 IN**	**4**	Turn ups
Male Adapter	**2 IN**	**1**	To Adapt Pump Flange to Manifold Assembly
Threaded Caps	**1 IN**	**4**	Turn-ups
Gate Valves	**1 IN**	**4**	To adjust head pressure
Pump	**20 GPM @ 17 FT**	**1**	Submersible Effluent
Switch		**1**	Sealed, Adjustable Switch
Alarm		**1**	Sealed Switch with Audible and Visible Alarm
Pump Tank	**750 Gals**	**1**	Single Compartment
Septic Tank	**750 Gals**	**1**	Two Compartment
Riser		**1**	To Raise Pump Access to 6" Above Finished Grade
Riser		**1**	To Provide access to outlet end of the septic tank
Riser Lid		**2**	To Fit Risers
Gravel	**¾"-1"**	**7-8 tons**	Trench Aggregate – must be clean and free of fines
Topsoil		**24 cubic yards**	
Concrete Blocks	**8 IN**	**2**	Pump Support
Nylon Rope		**8ft**	Pump Removal
Threaded Union	**2 IN**	**1**	Pump Removal
Paper	**12 IN**	**180ft**	To Cover Gravel
Mortar		**as needed**	
Grass Seed		**as needed**	
Mulch		**as needed**	
PVC Glue and Cleaner		**as needed**	

Note: All fittings are to be pressure fittings and enough to assemble system.