# ROLLANS *Soil & Environmental Services, Inc.*

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**Attached is a proposed design for an Accepted (25% reduction) Septic System with Pressure Manifold distribution for a 4 bedroom single family residence on Lot #67 Autumn Grove Subdivision, Iredell County, North Carolina.**

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**May 16, 2007**
**Project #: 01-1043**
**Design By: Rollans Soil and Environmental Services**

# PRESSURE MANIFOLD SYSTEM
# FOR WASTEWATER TREATMENT

| | |
|---|---|
| **Owner:** | Orchard Farms LLC |
| **Address:** | 227 Hideaway Lane<br>Mooresville, NC 28117 |
| **Phone:** | 704-201-6465 |
| **County:** | Iredell |
| **Location:** | Autumn Grove LOT 67 |
| **Source of Wastewater Flow:** | 4 Bedroom Single Family Residence |
| **Estimated Gallons Per Day Flow:** | 480 |
| **System Flow:** | 28.44 |

## Design Specifications

| | |
|---|---|
| **Drainfield Size:** | 480 |
| **Loading Rate (gpd/ft.$^2$):** | 0.25 |
| **Depth of Gravel in Trench:** | NA (25% reduction ) |
| **Gravel Size:** | NA (25% reduction ) |
| **Trench Depth:** | 36 in. |
| **Trench Width:** | 36 in. |
| **Septic Tank Size:** | 1000 |
| **Pump Tank Size:** | 1000 |
| **Estimated Supply Line Length:** | 156 |
| **Supply Line Diameter:** | 2 in. SCH 40 PVC |
| **Supply Line Volume:** | 27.14 |
| **Dosing Volume:** | 235.08 |
| **Supply Manifold:** | 4 in. SCH 80 PVC |
| **Supply Manifold Length:** | 4 ft. (minimum) |
| **Supply Manifold Volume:** | N/A |
| **Recommended Float Controls:** | SJE Sensor Float Control Switches as Required for Control Panel or County Approved Equivalents |
| **Recommended Control Panel:** | SJE-Rhombus Model 112 (NEMA 4x) Control Panel or County Approved Control Panel. |
| **Pressure Head:** | 2 ft. |
| **Friction Head:** | 2.78 |
| **Elevation Head:** | 8.90 |
| **Total Dynamic Head:** | 15.73 |
| **Threaded Union:** | In Tank |
| **Gate Valves:** | 1 in Tank<br>1 at Pressure Manifold |
| **Check Valves:** | In Tank |
| **Anti-Siphon Hole:** | NA |
| **Additional Comments:** | Soil suitability was performed by Rollans Soil & Environmental Services. |

# Autumn Grove LOT 67
## PRESSURE MANIFOLD DESIGN

| | |
|---|---|
| **DESIGN FLOW (gpd):** | 480 |
| **SOIL APPLICATION RATE (gpd/ft.$^2$):** | 0.25 |
| **TOTAL AREA TRENCH BOTTOM:** | 1440 |
| **TOTAL LATERAL LENGTH:** | 480 |
| **NUMBER OF FIELDS:** | 1 |
| **LATERAL LENGTH REQUIRED PER FIELD:** | 480 |
| **SUPPLY LINE LENGTH:** | 156 |
| **TOTAL DYNAMIC HEAD:** | 15.73 |
| **MANIFOLD SIZE:** | 4 in.SCH 80 PVC |
| **DOSING VOLUME:** | 235.08 |
| **PUMP TANK DRAW DOWN*:** | 11.2 |
| **SEPTIC TANK SIZE:** | 1000 |
| **PUMP TANK SIZE:** | 1000 |

**Pump tank draw down based on a volume basis of 21 gallons per inch. Draw down may vary among pump tank manufacturers.*

# Autumn Grove LOT 67

Project #: 01-1043

LAYOUT FOR 4 BEDROOM HOME

May 16, 2007

| LINE # | FLAG COLOR | BS | HI | FS | ELEVATION | FLAGGED LINE LENGTH | DESIGN LINE LENGTH |
|---|---|---|---|---|---|---|---|
| TBM | | 3.7 | | | 100.00 | | |
| INSTR. 1 | | | 103.70 | | | | |
| HOUSE | | | 97.60 | 6.10 | | | |
| TANK | | | 96.30 | 7.40 | | | |
| 1 | ORANGE | | | 3.00 | 100.70 | 36 | 36 |
| 2 | PINK | | | 3.60 | 100.10 | 53 | 53 |
| 3 | DARK PINK | | | 3.30 | 100.40 | 114 | 114 |
| 4 | BLUE | | | 3.20 | 100.50 | 130 | 130 |
| *5* | *PINK* | | | *3.50* | *100.20* | *142* | *120* |
| *6* | *ORANGE* | | | *3.80* | *99.90* | *134* | *120* |
| *7* | *DARK PINK* | | | *4.10* | *99.60* | *120* | *120* |
| *8* | *BLUE* | | | *4.50* | *99.20* | *120* | *120* |
| 9 | PINK | | | 5.00 | 98.70 | 112 | 112 |
| | | | | | **Total** | **961** | **925** |

| | LINE LENGTH | LTAR GPD/FT$^2$ | SYSTEM TYPE | SOIL LTAR GPD/FT$^2$ | TRENCH SYSTEM | DISTRIBUTION |
|---|---|---|---|---|---|---|
| ** System* | *480* | *0.25* | *ACCEPT.* | *0.25* | *25% RED.* | **PRESSURE** |
| Repair | 445 | 0.25 | MOD. | 0.25 | PPBPS | **MANIFOLD** LOW PRESSURE |

**Notes:**

** TBM located on left front corner lot 47 (see site plan)
**TBM is assumed to be 100'
**All measures in feet
**Nitrification lines are demonstrated on contour via colored pin flags
**BS, HI, and FS indicate rod readings

# PRESSURE MANIFOLD TAPSHEET - Autumn Grove LOT#67

## SYSTEM

| Line # | Color | Elevation | Length | Hole Size | Flow/Tap | Trench Area |
|---|---|---|---|---|---|---|
| *5* | *PINK* | 100.2 | **120** | SCH 40 1/2 | **7.11** | 360 |
| *6* | *ORANGE* | 99.9 | **120** | SCH 40 1/2 | **7.11** | 360 |
| *7* | *DARK PINK* | 99.6 | **120** | SCH 40 1/2 | **7.11** | 360 |
| *8* | *BLUE* | 99.2 | **120** | SCH 40 1/2 | **7.11** | 360 |
| | **total** | **feet =** | **480** | **gal/min =** | **28.44** | |
| | | | **Des. Flow** | **480** | | |
| | | | **Pump Run=** | **8.27** | | |
| | | | **soil LTAR** | **0.25** | | |
| | | | **LTAR +5%** | **0.2625** | | |
| | | | **LTAR with ACCEPTED** | **0.275625** | | |
| | | | **LTAR with ACCEPTED + 5%** | **0.28940625** | | |

## CALCULATIONS

Location Autumn Grove

Project Number 01-1043

Lot No: Lot 67

| | |
|---|---|
| No. of Bedrooms | 4 |
| Design Flow | 480 $^{gal}/_{day}$ |
| LTAR | 0.25 $^{gpd/ft^2}$ |
| 25% RED.? (YES OR NO) | YES |
| Supply Line Length | 156 ft. |
| Supply Line Volume | 27.144 gal. |
| Required Feet of Line | 480 ft. |
| Amount of Line from Layout | 480 ft. |
| Gallons per Minute | 28.44 $^{gal}/_{min}$ |
| Required Septic Tank Capacity | 1000 gal. |
| Minimum Standard Tank Size | 1000 |
| Lateral Line Volume | 313.44 gal. |
| Dosing Volume | 235.08 gal. |

*Note: Dosing Volume based on75% of lateral line volume*

| | |
|---|---|
| Tank Draw Down | 11.2 *Generic Draw Down of 21 gal.per in.* |
| Pump Run Time | 8.27 minutes |
| Elevation Head | 8.9 ft. |
| Pressure Head | 2 ft. |
| Friction Factor | 1.78 ft./100 ft. *(From the interpolater.)* |
| Friction Head | 2.78 ft. |
| Total Dynamic Head (+15%) | 15.73 ft. |

FRICTION FACTOR
INTERPOLATER
2" SCH 40 PVC

| GPM | *f* |
|---|---|
| 20 | 0.84 |
| | -0.88 |
| 25 | 1.27 |
| | -1.28 |
| 30 | 1.78 |
| | -1.76 |
| 35 | 2.37 |
| | -2.25 |
| 40 | 3.03 |
| 43.07 | 3.48 |
| 45 | 3.77 |
| 48.14 | 4.28 |
| 50 | 4.58 |
| 57.11 | 5.89 |
| 60 | 6.42 |