

Appendix G

Revised Preliminary Wastewater  
System Report





**PRELIMINARY  
WASTEWATER SYSTEM REPORT**

**For**

**SALEM HUNT**

**Town of North Salem, New York**

**December 5, 2006**

**Revised August 31, 2007**

**Revised May 14, 2008**

**Revised November 10, 2008**

**Revised April 24, 2009**

**Revised August 5, 2009**

Prepared by:  
Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512



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## 1.0 INTRODUCTION

The Salem Hunt project site is a 39.99± acre parcel located on the west side of June Road in the Town of North Salem in Westchester County. The subject parcel is located in the R-MF/4 (Residential – Multi-family) zoning district and is designated as Tax Map Number 5-1735-19. It is proposed to develop the site with 65 two bedroom attached residential townhouse units. The proposed units will gain access to the site by way of a proposed 20' wide access road off of June Road. Water will be supplied to the site by drilled wells that will serve as a public water supply for the proposed development. Wastewater will be disposed of with a wastewater treatment plant (WWTP) and community subsurface sewage disposal system (SSDS) servicing the entire development.

This report is prepared to address the wastewater system for the proposed residential development. The wastewater system will be designed in accordance with all applicable codes and regulations, including the Westchester County Department of Health's (WCDOH) *Rules and Regulations for the Design and Construction of Residential Subsurface Sewage Treatment Systems* and Chapter 873, Article X, of the Laws of Westchester County, New York, the New York State Department of Environmental Conservation (NYSDEC)'s 1988 *Design Standards for Wastewater Treatment Works - Intermediate Sized Sewerage Facilities*, and the 2004 *Recommended Standards for Wastewater Facilities* (a.k.a. 10-State Standards).

The proposed wastewater system will comply with all regulatory requirements, and will obtain all required permits and/or approvals from the following agencies:

WCDOH	Realty Subdivision Approval, Sewage Collection/Sewer Disposal, WWTP
NYCDEP	WWTP/SSDS, and Sewer Collection System
NYSDEC	SPDES Wastewater Permit

The SSDS construction will also be included in the project's NYSDEC Construction Activity GP-0-08-001 coverage. A sewage works transportation corporation will need to be created prior to the issuance of the NYSDEC's SPDES permit.

## 2.0 WASTEWATER DESIGN FLOW

The wastewater design flows for the project are based on the 1988 NYSDEC publication *Design Standards for Wastewater Treatment Works - Intermediate Sized Sewerage Facilities*. The following hydraulic loading rates have been established for the Salem Hunt project:

2 Bedroom Residential Unit	=	300 gpd/unit
65 Residential Units x 300 gpd/unit	=	19,500 gpd

Utilizing the NYSDEC's 20% reduction (3,900 gpd) allowance for water saving fixtures yields a Residential Daily Design Flow of      19,500 gpd – 3,900 gpd      =      15,600 gpd

An allowance of 400 gpd will be included for the proposed community building. Note that the majority of users at the community building will be Salem Hunt residents, and any sewer flows for these residents have been previously accounted for in the residential flows.

Total project wastewater daily flow = 15,600 gpd + 400 gpd = 16,000 gpd.

## 3.0 WASTEWATER COLLECTION SYSTEM

The wastewater collection system is proposed to consist of 8" diameter PVC SDR 35 sewer mains and precast concrete sewer manholes. The sewer mains are proposed to be located generally in the proposed road system. Individual 4" diameter PVC SDR 35 sewer service connections with cleanouts are

proposed for each unit. Wastewater flow from all of the proposed units and the wastewater collection system will be by gravity. The 8" diameter sewer mains are proposed to discharge to the WWTP.

#### **4.0 WASTEWATER TREATMENT PLANT**

Wastewater treatment will take place using the Biologically-Engineered Single-Sludge Treatment (BESST) system, manufactured by Purestream ES, LLC. This package system will include anoxic, aerobic and clarifier chambers, allowing carbonaceous BOD reduction, nitrification and denitrification to occur within a single tank. The aerobic and clarifier chambers will be supplied each as duplicate units in parallel for added operational flexibility in the initial phase of the development. See Figure WWTP-1, WWTP Process Flow Diagram and Appendix B – WWTP Product Literature for more detail.

The BESST system will be preceded by a flow equalization tank, to attenuate peak hourly flows and apply wastewater at a constant flow rate for treatment; and it will be followed by a two-cell rapid sand filter for final polishing. This process selection is expected to produce treated effluent with less than 10 mg/l (or parts per million) biochemical oxygen demand (BOD<sub>5</sub>), 10 mg/l total suspended solids (TSS) and 10 mg/l total nitrogen (TN). For comparison, untreated domestic wastewater typically has concentrations of around 240 mg/l BOD<sub>5</sub>, 240 mg/l TSS and 50 mg/l TN.

The treatment system will also be equipped to remove phosphorus by chemical precipitation. Waste sludge produced will be stored under controlled conditions for periodic removal to a permitted disposal location offsite. The entire treatment system will be housed within a 1,900 sq. ft. building for security and aesthetic considerations (See Figure WWTP-2, WWTP Preliminary Building Layout for detail). The building will contain an odor control system as well as an emergency power generator capable of automatic start upon line power loss, and of operating the entire facility until main power is restored. An automatic telephone dialer will be provided to transmit process alarm conditions to a continuously-monitored offsite location.

The WWTP will collect and entirely treat the flow from the sanitary sewage system. No treatment or renovation of the discharge will be required by soil, as with a traditional subsurface treatment system. The discharge from the plant has been treated to such a quality that it could be discharged to a surface water body or stream. The biomass that usually forms in a subsurface treatment system will not be established in this subsurface disposal system because treatment has already occurred in the WWTP. The hydraulic capacity of the soil for the proposed disposal system has been confirmed with the geotechnical engineer for the project.

The effluent from the WWTP will discharge to a duplex pump station. This pump station will convey the WWTP effluent through a 2" to 3" diameter force main to the subsurface sewage disposal area. An automatic standby emergency backup generator located in the WWTP building will also be connected to the pump station to provide continuous operation of the wastewater systems, even during a power outage.

#### **5.0 SUBSURFACE SEWAGE DISPOSAL SYSTEM (SSDS)**

##### **5.1 Soil Testing**

The subsurface sewage disposal system (SSDS) area will be located in the eastern portion of the site. The entire project site was extensively evaluated during the initial SEQRA review process, and this area was deemed the most favorable area for wastewater treatment. Soil testing was witnessed by Insite Engineering, Surveying & Landscape Architecture, P.C. (Insite) the Westchester County Department of Health (WCDOH) and the New York City Department of Environmental Protection (NYCDEP) during the SEQRA process and was determined to be acceptable for a SSDS. Thirty-one (31) deep test pits were dug and witnessed in the selected SSDS area. Test pits were dug to a minimum depth of 7' – 0" and generally consisted of a mixture of sand and loam with some silt and gravel. No groundwater, bedrock or mottling was encountered within the minimum regulatory depths of all of the test pits. Thirty-one (31) percolation tests were also performed and witnessed at that time. The rates recorded ranged from 3.0 min/in to 5.3 min/in. (Refer to the attached Design Data Sheets for specific information regarding Insite's testing).

5.2 SSDS Sizing

The following table summarizes the design criteria for the SSDS sizing. Based on recent discussions with the WCDOH, their policy is to not take credit for allowable NYCDEP reductions in SSDS size or expansion area when the SSDS is provided pre-treatment with a WWTP.

	WCDOH Regulatory Minimum SSDS Sizing	Proposed SSDS Sizing
<b>Design Flow</b>	16,000 GPD	16,000 GPD
<b>Percolation Rate</b>	6 to 7 Min/In <sup>1</sup>	11 to 15 Min/In
<b>Sewage Application Rate</b>	1.0 GPD/SF	0.8 GPD/SF
<b>Reduction in SSDS Size for Pre-Treatment with WWTP</b>	0% <sup>2</sup>	0%
<b>Expansion Area Provided</b>	100% <sup>3</sup>	100%
<b>Length of Absorption Trenches</b>		
<b>Primary</b>	8,000 LF	10,000 LF
<b>Expansion</b>	8,000 LF	8,000 LF
<b>Total:</b>	16,000 LF	18,000 LF

As seen from the table above, the actual length of absorption trenches provided are greater than what is actually required based on regulatory minimum requirements. The primary SSDS will be sized using a conservative 11 to 15 min/in percolation rate, even though the actual witnessed rates for the 31 percolation test holes ranged between 3 and 5.3 min/in. No reductions were taken in SSDS size (as allowed by NYCDEP regulations), and 100% expansion area is provided (only 50% is required by NYCDEP regulations).

Although it has been shown through the DEIS and FEIS work by the team’s consultants that the proposed wastewater system will function adequately as originally proposed, several factors of safety have been included with the current wastewater system design. The addition of a WWTP for pre-treatment, although not required by any regulatory agency, has been provided to discharge cleaner effluent into the ground. Providing more than the regulatory requirements in absorption trench length will ensure that the SSDS will function adequately for a longer period of time than if the SSDS were sized based on the minimum regulatory requirements.

5.3 Absorption Trenches

The SSDS absorption fields consist of conventional 2’ wide absorption trenches. The trenches will be divided into two groups (Groups 1 and 2). Each group will be divided into six sections. Each of the twelve SSDS sections are limited in size to include a maximum primary trench length of 1,000 linear feet per section. Each section will be dosed through an automatic multizone valve. Each of the

two multizone valves is a pressure based distribution device with one inlet and 6 outlets. After a section of SSDS absorption trenches are dosed, the pressure will drop in the forcemain and the multizone valve will index to the next section.

The project's absorption trench layout is attached as Figure SSDS-1. The following table summarizes the actual absorption trench layouts.

**Absorption Trench Layout**

SSDS Section	Primary Absorption Trenches	Expansion Absorption Trenches	Total Length of Absorption Trenches
1A	12 @ 70' = 840'	10 @ 70' = 700'	1,540'
1B	12 @ 70' = 840'	10 @ 70' = 700'	1,540'
1C	9 @ 93' = 837'	7 @ 93' = 651'	1,488'
1D	9 @ 93' = 837'	7 @ 93' = 651'	1,488'
1E	9 @ 93' = 837'	7 @ 93' = 651'	1,488'
1F	14 @ 60' = 840'	11 @ 60' = 660'	1,500'
2A	14 @ 60' = 840'	11 @ 60' = 660'	1,500'
2B	10 @ 84' = 840'	8 @ 84' = 672'	1,512'
2C	10 @ 84' = 840'	8 @ 84' = 672'	1,512'
2D	10 @ 84' = 840'	8 @ 84' = 672'	1,512'
2E	9 @ 93' = 837'	7 @ 93' = 651'	1,488'
2F	12 @ 70' = 840'	10 @ 70' = 700'	1,540'
<b>Totals:</b>	<b>10,068' Primary</b>	<b>8,040' Expansion</b>	<b>18,108' Total</b>

The twelve SSDS sections will be distributed over the entire SSDS area (6.5 acres) to evenly disperse the wastewater. A geotechnical engineer has performed a groundwater mounding analysis for the project. The mounding analysis has determined that the project's design flows can be supported by the SSDS area's underlying soils. For further information please see the project's *Hydrogeology Investigation Report*, (and Supplemental Addendums) prepared by Geodesign, Inc.

- 1      6 to 7 min/in percolation rate based on 31 witnessed percolation test holes ranging from 3 to 5.3 min/in.
- 2      NYCDEP allows up to a 25% reduction in SSDS size for pretreatment with a WWTP.
- 3      NYCDEP allows providing for 50% expansion area (instead of 100% as required by WCDOH) for pretreatment with a WWTP.

**FIGURES**



# WASTEWATER TREATMENT PLANT PROCESS FLOW DIAGRAM

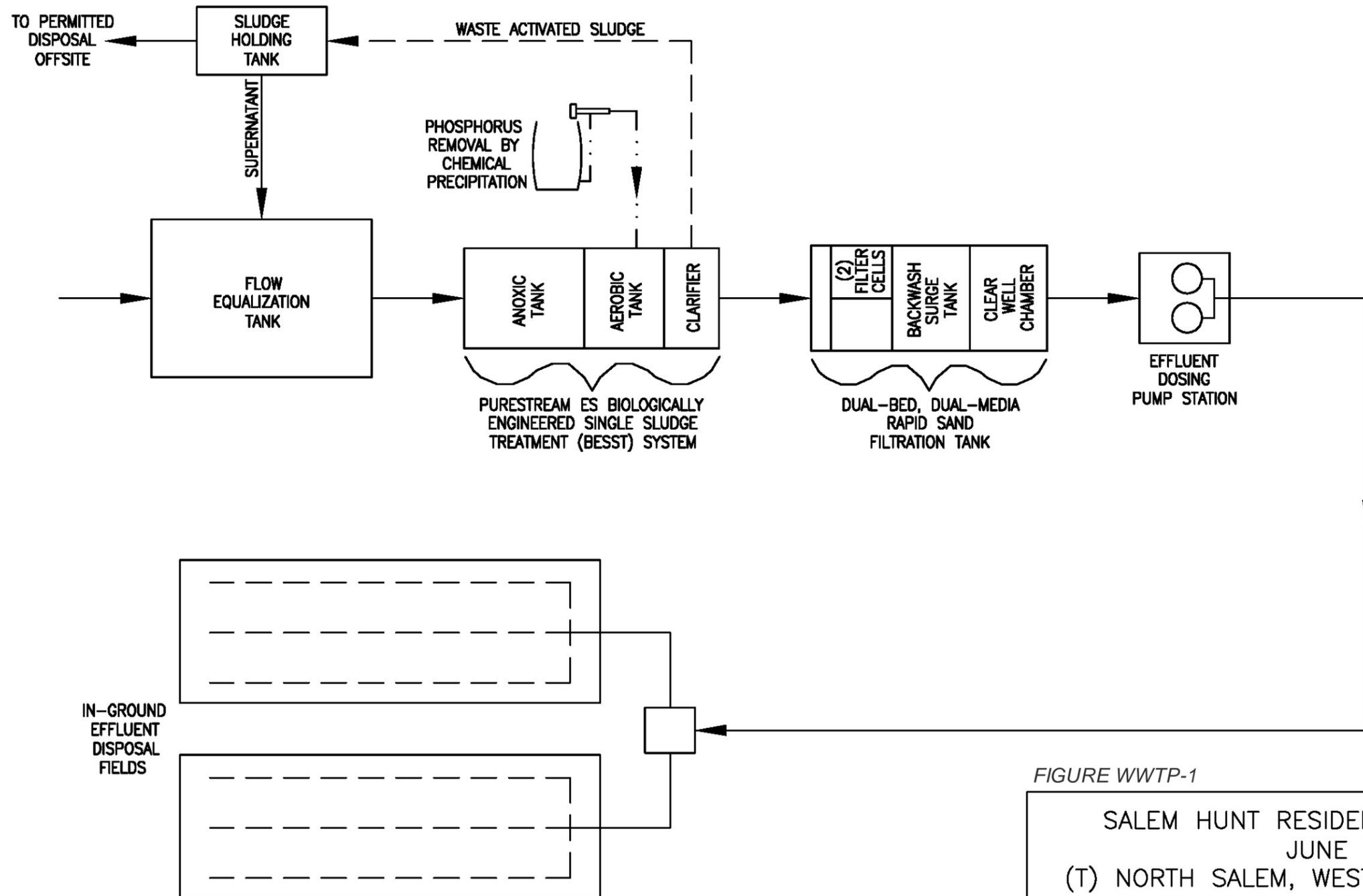


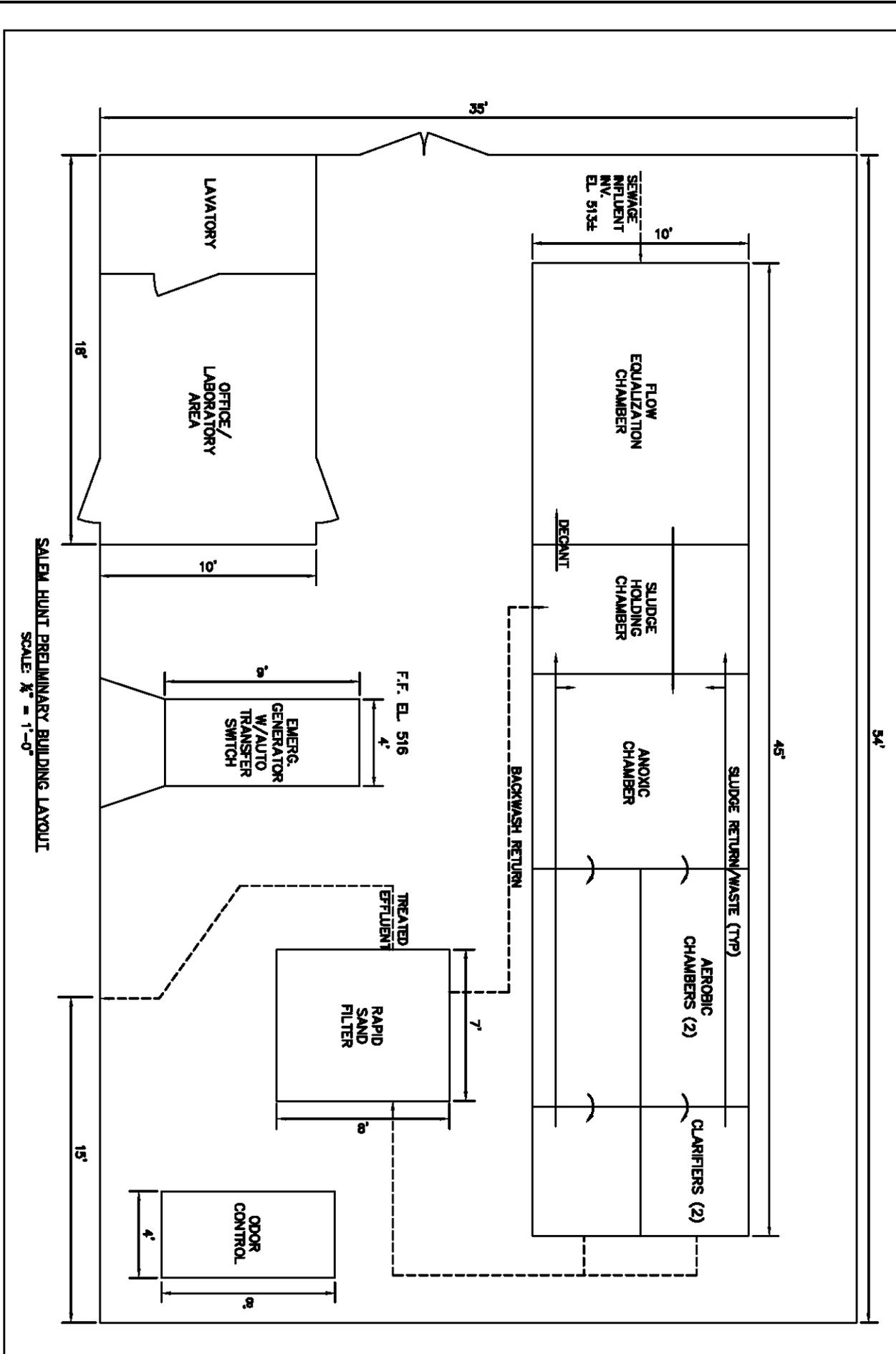
FIGURE WWTP-1

SALEM HUNT RESIDENTIAL DEVELOPMENT  
 JUNE ROAD  
 (T) NORTH SALEM, WESTCHESTER COUNTY, NY

## MILNES ENGINEERING INC.

PLANNING • DESIGNING • ENGINEERING •  
 SURVEYING • CONSTRUCTION SERVICES  
 12 FREAR HILL ROAD  
 TUNKHANNOCK, PA 18657





SALEM HUNT PRELIMINARY BUILDING LAYOUT  
SCALE: 1/8" = 1'-0"

FIGURE WWTP-2

SALEM HUNT RESIDENTIAL DEVELOPMENT  
JUNE ROAD  
(T) NORTH SALEM, WESTCHESTER COUNTY, NY

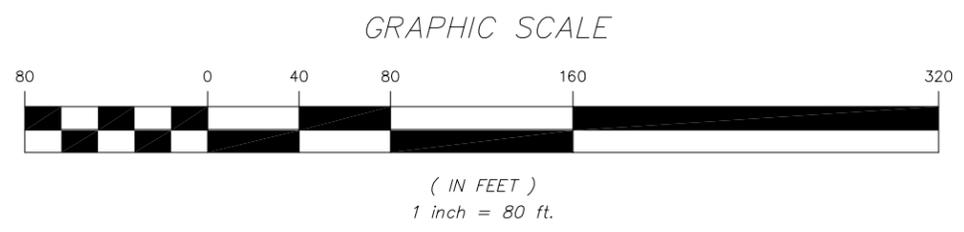
**MILNES ENGINEERING INC.**  
PLANNING • DESIGNING • ENGINEERING •  
SURVEYING • CONSTRUCTION SERVICES  
12 FREAR HILL ROAD  
TUNKHANNOCK, PA 18857





**Notes:**

1. Refer to Site Plans prepared by Insite Engineering, Surveying & Landscape Architecture, P.C. for General Notes.
2. This plan is schematic and is not to be used for permitting or construction. The intent of this plan is to depict the layout of the proposed primary and expansion absorption trenches.
3. The primary SSDS absorption trenches (10,000 l.f. minimum, required 10,068 l.f. provided) and expansion SSDS absorption trenches (8,000 l.f. minimum, required 8,040 l.f. provided) will be evenly divided into two groups (Group 1, and Group 2). Each group will be divided into 6 sections, section 1A, 1B, 1C, 1D, 1E, 1F and section 2A, 2B, 2C, 2D, 2E, 2F.



SSDS LEGEND	
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	PROPOSED 10' CONTOUR
	PROPOSED 2' CONTOUR
	PROPOSED 2' WIDE PRIMARY ABSORPTION TRENCH
	PROPOSED 2' WIDE EXPANSION ABSORPTION TRENCH
	DEEP TEST HOLE
	PERCOLATION TEST HOLE
<b>1A</b>	SSDS GROUP/SECTION DESIGNATION

Z:\E\05171100\SSSTS reports\Figure SSSTS-1.dwg, 4/17/2009 3:12:07 PM, enick, 1:1

DATE: 4-17-09  
 SCALE: 1" = 80'  
 PROJECT NO.: 05171.100  
 FIGURE: SSDS-1

**INSITE**  
 ENGINEERING, SURVEYING &  
 LANDSCAPE ARCHITECTURE, P.C.  
 3 Garrett Place • Carmel, New York 10512  
 Phone (845) 225-9690 • Fax (845) 225-9717  
 www.insite-eng.com

PREPARED BY:  
 SALEM HUNT

PROJECT: JUNE ROAD, TOWN OF NORTH SALEM, WESTCHESTER COUNTY, NEW YORK  
 DRAWING: SSDS SCHEMATIC



**APPENDIX A**

**Design Data Sheets**



1/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilder Balter Partners, LLC Address 570 Tappan Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/21/07 Run Date: 8/22/07

Hole #	CLOCK TIME				PERCOLATION				
	Hole Number	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface	Water Level Drop In Inches	Soil Rate Min/in Drop	
1	1		9:40	9:45	5	20	23	3	1.7
	2		9:45	9:52	7	20	23	3	2.3
	3		9:52	10:01	9	20	23	3	3
	4		10:01	10:10	9	20	23	3	3
	5								
2	1		10:14	10:17	3	20	23	3	1
	2		10:18	10:22	4	20	23	3	1.3
	3		10:23	10:28	5	20	23	3	1.7
	4		10:29	10:35	6	20	23	3	2
	5		10:36	10:42	6	20	23	3	2
	6		10:43	10:51	8	20	23	3	2.7
	7		10:51	11:00	9	20	23	3	3
	8		11:01	11:10	9	20	23	3	3

Perc test done by (Ensite) Eric Schlobahn  
(WCDOH) William Eilbacher

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

YU

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH G.L.	HOLE NO. 1	HOLE NO. 2	HOLE NO. _____	HOLE NO. _____
	0" to 6"	0" to 6"		
6"	Top Soil	Top Soil		
	6" to 22"	6" to 22"		
12"	Yellow-Brown	Yellow-Brown		
18"	Fine Silty Sand	Fine Silty Sand		
24"				
30"				
36"				
42"	22" to 84" (+)	22" to 84" (+)		
48"	moderately	moderately		
54"	compacted	compacted		
60"	Fine Grey	Fine Grey		
66"	Sand With	Sand With		
72"	Gravel	Gravel		
78"				
84"				

WAS GROUNDWATER ENCOUNTERED no  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WOODH), JOHN DRAKE (NUCDEP)

Soil Rate Used \_\_\_\_\_ Min/1" Drop: DESIGN S.D. Usable Area Provided \_\_\_\_\_

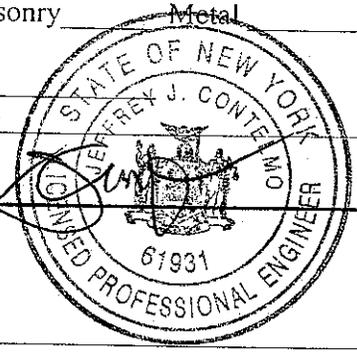
No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
 Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_

Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal. Checked by \_\_\_\_\_

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilden Balter Partners, LLC Address 570 Tuxeter Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 08/21/07

Run Date: 08/22/07

Hole #	CLOCK TIME				PERCOLATION			
	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Depth to Water From Ground Surface Stop Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
3	1	9:43	9:48	5	20	23	3	1.7
	2	9:48	9:57	9	20	23	3	3
	3	9:57	10:06	9	20	23	3	3
	4							
	5							
4	1	10:33	10:38	5	18	21	3	1.7
	2	10:39	10:45	6	18	21	3	2
	3	10:46	10:54	8	18	21	3	2.7
	4	10:55	11:04	9	18	21	3	3
	5	11:04	11:13	9	18	21	3	3
	6							
	2							
	3							
	4							
	5							

Perc test done by: Eric Schlobohm (InSite)  
William Eilbacher (WCDOT)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

2/11

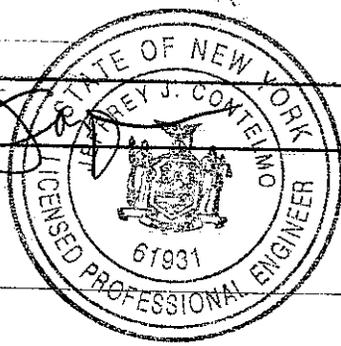
TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH G.L.	HOLE NO. 3	HOLE NO. 4	HOLE NO. _____	HOLE NO. _____
0"	0" to 8" Top Soil	0" to 6" Top Soil		
6"				
12"	8" to 24" Yellow-Brown Fine Silty Sand	6" to 22" Yellow-Brown Fine Silty Sand		
18"				
24"				
30"				
36"				
42"	24" to 84" (+) moderately compacted Fine grey Sand with Gravel	22" to 84" (+) moderately compacted Grey Sand With gravel		
48"				
54"				
60"				
66"				
72"				
78"				
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WCDOM), JOHN DRAKE (NUCODER)  
 DESIGN

Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_  
 No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_  
 Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
 Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature   
 Seal 

Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

3/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilder Balter Partners, LLC Address 570 Twitter Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) June Road (Indicate nearest cross street) Sec. 5 Block 1735 Lot 19

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/21/07 Run Date: 8/22/07

Hole #	CLOCK TIME				PERCOLATION				
	Hole Number	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Stop Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
5	1		9:50	9:55	5	19	22	3	1.7
	2		9:55	10:01	6	19	22	3	2
	3		10:01	10:10	9	19	22	3	3
	4		10:10	10:19	9	19	22	3	3
	5								
6	1		9:42	9:47	5	19	22	3	1.7
	2		9:47	9:56	9	19	22	3	3
	3		9:56	10:05	9	19	22	3	3
	4								
	5								
7	1		9:40	9:46	6	19	22	3	2
	2		9:46	9:57	11	19	22	3	3.7
	3		9:57	10:08	11	19	22	3	3.7
	4								
	5								

Perc test done by: Zac Pearson (insite)  
William Filbacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

3/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH G.L.	HOLE NO. 5	HOLE NO. 6	HOLE NO. 7	HOLE NO. _____
	0" to 6" Top Soil	0" to 6" Top Soil	0" to 6" Top Soil	
6"	6" to 22"	6" to 32"		
12"	Yellow Brown	Yellow Brown	6" to 36"	
18"	Fine Silty Sand	Fine Silty Sand	Reddish Brown	
24"	25" to 44"		Fine Silty Sand	
30"	Reddish Brown			
36"	Fine Silty Sand			
42"				
48"		32" - 84" (+)		
54"	44" to 84" (+)	Reddish Brown	36" - 84" (+)	
60"	moderately	Fine silty	moderately	
66"	compacted	Sand with	compacted	
72"	Grey Sand	Gravel And	Grey Sand	
78"	With Gravel	Cobles	With Gravel	
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WOOD), JOHN DANKS (NYCED)

DESIGN  
 Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelro, P.E.  
Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

4/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Willer Butler Partners, LLC Address 570 Tarter Road, 6<sup>th</sup> Floor, Elmstead, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Tierras

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH APPLICATION

Presoak Date: 8/20/07 (P8, P10) Run Date: 8/21/07 (P9)  
8/22/07 (P9)

Hole #	CLOCK TIME				PERCOLATION			
	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Depth to Water From Ground Surface Stop Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
8	1	1:25	1:30	5	20	23	3	1.7
	2	1:30	1:39	9	20	23	3	3
	3	1:39	1:48	9	20	23	3	3
	4							
	5							
9	1	10:25	10:29	4	21	24	3	1.3
	2	10:29	10:38	9	21	24	3	3
	3	10:38	10:47	9	21	24	3	3
	4							
	5							
10	1	1:04	1:19	15	20	23	3	5
	2	1:19	1:35	16	20	23	3	5.3
	3	1:37	1:53	16	20	23	3	5.3
	4							
	5							

Perc test done by: Eric Schlobahn/Zac Pearson (insite)  
William Filbacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

4/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH	HOLE NO. 8	HOLE NO. 9	HOLE NO. 10	HOLE NO. _____
G.L.	0" to 6"	0" to 6"	0" to 6"	
6"	Top Soil	Top Soil	Top Soil	
12"		6" to 34"	6" to 26"	
18"	6" to 34"	Yellow Brown	moderately compacted	
24"	Reddish Brown	Sandy LOAM	Yellow Brown	
30"	Fine Silty	18" to 36"	Sandy Loam	
36"	Sand	Fine / medium grey Sand		
42"			26" to 84" (+)	
48"	34" to 92" (+)	36" to 84" (+)	Light Gray	
54"	moderately compacted	moderately compacted	Fine / medium Sand	
60"	Gray Sand with gravel	Fine Gray Sand		
66"				
72"				
78"				
84"				

WAS GROUNDWATER ENCOUNTERED no  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED n/a  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED n/a  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WCDOR), JOHN DRAKE (NYCDEP)

DESIGN  
 Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

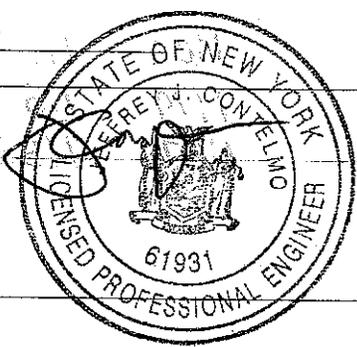
No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
 Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Camel, New York 10512

Signature \_\_\_\_\_

Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

5/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALAM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wildel Balter Partners, LLC Address 570 Tarter Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION  
Presoak Date: 8/20/07 (P13) Run Date: 8/21/07 (P13)  
8/21/07 (P11 & P12) 8/22/07 (P11 & P12)

Hole #	CLOCK TIME				PERCOLATION				
	Hole Number	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Water Level Drop In Inches	Soil Rate Min/in Drop	
11	1		10:26	10:31	5	21	24	3	1.7
	2		10:31	10:40	9	21	24	3	3
	3		10:40	10:49	9	21	24	3	3
	4								
	5								
12	1		10:50	10:58	8	20	23	3	2.7
	2		10:58	11:07	9	20	23	3	3
	3		11:07	11:16	9	20	23	3	3
	4								
	5								
13	1		12:51	1:00	9	20	23	3	3
	2		1:02	1:12	10	20	23	3	3.3
	3		1:13	1:23	10	20	23	3	3.3
	4								
	5								

Perc test done by: Eric Schlobom, Zac Pearson (Insite)  
William Eilbacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

5/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH G.L.	HOLE NO. 11	HOLE NO. 12	HOLE NO. 13	HOLE NO. _____
0"	0" to 6" Top Soil	0" to 6" Top Soil	0" to 8" Top Soil	
6"	X 6" to 22"	X	X	
12"	Yellow Brown			
18"		6" to 30"	8" to 32"	
24"	X Fine Silty Sand	Yellow Brown	Yellow Brown	
30"		Sandy Loam	Sandy Loam	
36"		X	X	
42"	22" to 84" (+)			
48"	moderately compacted	30" to 96" (+)	32" to 84" (+)	
54"	Grey Sand	Light Grey	Light Grey	
60"	With gravel	Fine Medium Sand	Fine Medium Sand	
66"				
72"				
78"				
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARRNER (WOODH), JOHN DRAKE (NUCDEP)  
 DESIGN

Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

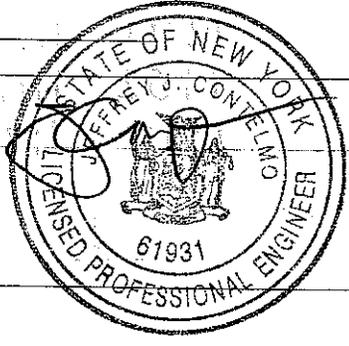
No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Cortelmo, P.E.  
Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_

Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

6/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilber Batten Partners, LLC Address 570 Taster Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) Jane Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/20/07

Run Date: 8/21/07

Hole #	CLOCK TIME				PERCOLATION			
	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Stop Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
14	1	11:42	11:48	6	16	19	3	2
	2	11:49	11:58	9	16	19	3	3
	3	11:59	12:08	9	16	19	3	3
4								
5								
15	1	12:50	12:56	6	21	24	3	2
	2	12:56	1:05	9	21	24	3	3
	3	1:05	1:14	9	21	24	3	3
4								
5								
16	1	1:26	1:33	7	20	23	3	2.3
	2	1:33	1:43	10	20	23	3	3.3
	3	1:43	1:54	11	20	23	3	3.6
	4	1:54	2:05	11	20	23	3	3.6
5								

Perc test done by: Eric Schlobom, Zac Pearson (insite)  
William E. Tschacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

6/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH G.L.	HOLE NO. 14	HOLE NO. 15	HOLE NO. 16	HOLE NO. _____
0"	0" to 6" top soil	0" to 6" top soil	0" to 6" top soil	
6"	6" to 22"	6" to 25"	6" to 30"	
12"	Yellow Brown	Yellow Brown	Reddish Brown	
18"	Sandy LOAM	FINE Silty Sand	Fine Silty Sand	
24"				
30"				
36"	22" to 84" (+)	25" to 90" (+)	30" to 84" (+)	
42"	Light Grey	Slightly	Moderately	
48"	Fine Medium	compacted	Compacted	
54"	Sand	Grey Sand	Sand and	
60"		with gravel	gravel	
66"				
72"				
78"				
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WOODH), JOHN DRAKE (WOODH)  
 DESIGN

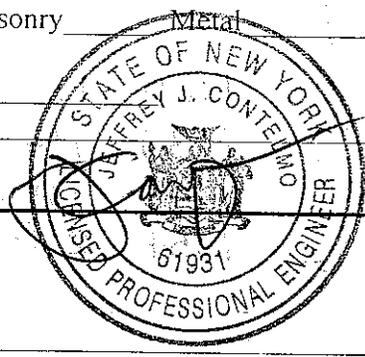
Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Camel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

7/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALOM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wildcat Partner Partners, LLC Address 570 Toxter Road, 6th Floor, Elmsford, NY 10503

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/20/07

Run Date: 8/21/07

Hole #	CLOCK TIME				PERCOLATION				
	Hole Number	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Water Level Drop In Inches	Soil Rate Min/in Drop	
17	1		1:28	1:32	4	20	23	3	1.3
	2		1:32	1:42	10	20	23	3	3.3
	3		1:42	1:52	10	20	23	3	3.3
	4								
	5								
18	1		11:41	11:50	9	21	24	3	3
	2		11:50	12:05	15	21	24	3	5
	3		12:05	12:20	15	21	24	3	5
	4								
	5								
19	1		11:05	11:10	5	17	20	3	1.7
	2		11:10	11:19	9	17	20	3	3
	3		11:19	11:28	9	17	20	3	3
	4								
	5								

Perc test done by: Zac Pearson (Insite)  
William E. Ibach (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

7/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH	HOLE NO. 17	HOLE NO. 18	HOLE NO. 19	HOLE NO. _____
G.L.	0" to 6"	0" to 6"	0" to 10"	
	Top Soil	Top Soil	Top Soil	
6"	6" to 28"	6" to 28"		
12"	moderately	moderately	10" to 24"	
18"	Compacted	Compacted	Yellow Brown	
24"	Reddish Brown	Fine Silty	Fine Sand	
30"	Fine Silty Sand	Sand	with Silt	
36"			24" to 38"	
42"			moderately	
48"			Compacted	
54"	30" to 84" (+)	28" to 90" (+)	Fine grey Sand	
60"	moderately	moderately		
66"	Compacted	Compacted	38" to 84" (+)	
72"	Sand and	Grey Sand	Light Grey	
78"	gravel	and Gravel	Fine to Medium Sand	
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MANNING (WCDON), JOHN DEANE (NYCDOP)

DESIGN

Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
 Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

8/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilder Walter Partners, LLC Address 50 Texter Road, 6th Floor, Elmsford, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titicus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/20/07 Run Date: 8/21/07

Hole #	CLOCK TIME				PERCOLATION			
	Hole Number	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
20	1		12:52	1:01	9	20	23	3
	2		1:01	1:12	11	20	23	3
	3		1:12	1:23	11	20	23	3
21	1		11:35	11:44	9	21	24	3
	2		11:44	11:56	12	21	24	3
	3		11:56	12:08	12	21	24	3
22	1		1:29	1:34	5	19.5	23	3.5
	2		1:42	1:47	5	20	23	3
	3		1:48	1:54	6	20	23	3
	4		1:57	2:03	6	20	23	3
	5		2:04	2:11	7	19.5	22.5	3
	6		2:22	2:21	9	20	23	3
	7		2:21	2:30	9	20	23	3

Perc test done by: Eric Schlabom, Zac Pearson (Insite)  
William Eitbacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

8/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH	HOLE NO. 20	HOLE NO. 21	HOLE NO. 22	HOLE NO. _____
G.L.	0" to 6"	0" to 8"	0" to 6"	
6"	Top Soil	TOP SOIL	Top Soil	
12"	6" to 30"	18" to 30"	6" to 20"	
18"	moderately	moderately	Yellow Brown	
24"	compacted	compacted	Sandy LOAM	
30"	Fine Grey Silty Sand	Fine Grey Sand		
36"		30" to 40"		
42"		moderately compacted grey sand	20" to 88" (+)	
48"	30" to 90" (+)		Light Grey	
54"	moderately		Fine Medium	
60"	compacted	40" to 84" (+)	Sand	
66"	Grey Sand	Light Grey		
72"	And Gravel	Fine to Medium		
78"		Sand		
84"				

WAS GROUNDWATER ENCOUNTERED no  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED n/a  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED n/a  
 DEEPEST MADE BY JOHN WATSON, PE (INSURE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WCDON), JOHN DRAKE (NUCDER)

Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
 Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

9/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALOM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wildier Butler Partners, LLC Address 570 Tarter Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titewus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/20/07

Run Date: 8/21/07

Hole #	CLOCK TIME				PERCOLATION				
	Hole Number	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Water Level Drop In Inches	Soil Rate Min/in Drop	
23	1		11:09	11:15	6	20	23	3	2.
	2		11:16	11:23	7	20	23	3	2.3
	3		11:24	11:33	9	20	23	3	3
	4		11:35	11:44	9	20	23	3	3
	5								
24	1		11:06	11:13	7	20	23	3	2.3
	2		11:14	11:23	9	20	23	3	3
	3		11:24	11:33	9	20	23	3	3
	4								
	5								
25	1		9:51	10:01	10	20.5	23.5	3	3.3
	2		10:03	10:18	15	21	24	3	5
	3		10:19	10:33	14	20.5	23.5	3	4.6
	4								
	5								

Perc test done by: Eric Schlobom (Insite)  
William Eilbacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

9/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH	HOLE NO. 23	HOLE NO. 24	HOLE NO. 25	HOLE NO. _____
G.L.	0" to 15"	0" to 10"	0" to 5"	
6"	Top Soil	Top Soil	Top Soil	
12"				
18"	15" to 30"	10" to 24"	5" to 24"	
24"	Yellow Brown Sandy loam	Yellow Brown Fine Sand with Silt	Yellow Brown Sandy loam	
30"		24" to 38"	24" to 30"	
36"		moderately compacted Fine grey Sand	moderately compacted Sand and gravel	
42"			30" to 40"	
48"	30" to 104" (+)		Sand and gravel	
54"	Light Grey Fine/Medium Sand	38" to 84" (+)	40" to 84" (+)	
60"		Light grey Fine/Medium Sand	moderately compacted Sand and gravel	
66"				
72"				
78"				
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WOODR), JOHN BRADY (NUCOEL)

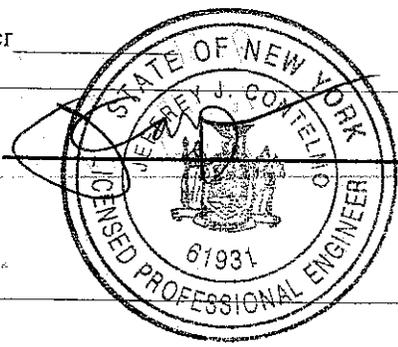
DESIGN  
 Soil Rate Used \_\_\_\_\_ Min/1" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
 Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

10/11

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALEM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilder Butler Partners, LLC Address 570 Taylor Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) JUNE Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salem Watershed Titius

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/20/07

Run Date: 8/21/07

Hole #	CLOCK TIME				PERCOLATION			
	Run No.	Start	Stop	Elapse Time Min.	Depth to Water From Ground Surface Start Inches	Stop Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
26	1	9:47	9:52	5	20	25	5	1
	2	9:53	9:58	5	20	23	3	1.6
	3	10:09	10:16	7	20	23	3	2.3
	4	10:16	10:23	7	20	23	3	2.3
	5	10:24	10:32	8	20	23	3	2.6
	6	10:36	10:45	9	20	23	3	3
	7	10:46	10:55	9	20	23	3	3
27	1	10:17	10:22	5	19	22	3	1.6
	2	10:23	10:32	9	19	22	3	3
	3	10:32	10:41	9	19	22	3	3
28	1	9:45	9:51	6	17	20	3	2
	2	9:51	10:00	9	17	20	3	3
	3	10:00	10:09	9	17	20	3	3

Perc test done by: Eric Schloham, Jac Pearson (Insito)  
William Filbachar (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

10/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH G.L.	HOLE NO. 26	HOLE NO. 27	HOLE NO. 28	HOLE NO. _____
6"	0" to 12" Top Soil	0" to 10" Top Soil	0" to 10" Top Soil	
12"	X	X	X	
18"	12" to 36"	10" to 30"	10" to 30"	
24"	yellow Brown Sandy loam	Fine Sand With Silt	moderately Compacted Fine grey Sand	
30"	X	X	X	
36"	36" to 60"		30" to 42"	
42"	moderately Compacted		Fine Silty Sand	
48"	X	X	X	
54"	Sand And Gravel	30" to 91" (+) Light Gray	42" to 98" (+) Light Gray	
60"	X	Fine/Medium Sand	Fine/Medium Sand	
66"	60" to 86" (+) Light Gray			
72"				
78"	Fine/Medium Sand			
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (INSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WOODH), JOHN DICKIE (NYCDEP)

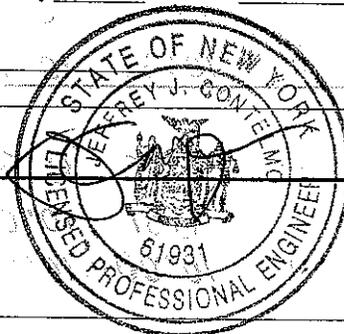
DESIGN  
 Soil Rate Used \_\_\_\_\_ Min/1" Drop: S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Carmel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal Checked by \_\_\_\_\_

n/n

WESTCHESTER COUNTY DEPARTMENT OF HEALTH  
Bureau of Environmental Quality  
118 North Bedford Road  
Mount Kisco, NY 10549

SALOM HUNT

DESIGN DATA SHEET - SEPARATE SEWAGE SYSTEM FILE NO. \_\_\_\_\_

Owner Wilder Galter Partners, LLC Address 570 Tuxter Road, 6<sup>th</sup> Floor, Elmsford, NY 10523

Located at (Street) June Road Sec. 5 Block 1735 Lot 19  
(Indicate nearest cross street)

Municipality North Salom Watershed Titus

SOIL PERCOLATION TEST DATA REQUIRED TO BE SUBMITTED WITH PPLICATION

Presoak Date: 8/20/07

Run Date: 8/21/07

Hole #	CLOCK TIME				PERCOLATION			
	Run No.	Start	Stop	Elapse Time Min.	Start Inches	Stop Inches	Water Level Drop In Inches	Soil Rate Min/in Drop
29	1	9:52	9:57	5	20	23	3	1.7
	2	9:57	10:06	9	20	23	3	3
	3	10:06	10:15	9	20	23	3	3
	4							
	5							
30	1	10:33	10:39	6	22	25	3	2
	2	10:39	10:48	9	22	25	3	3
	3	10:48	10:57	9	22	25	3	3
	4							
	5							
31	1	11:01	11:06	5	21	24	3	1.7
	2	11:06	11:15	9	21	24	3	3
	3	11:15	11:24	9	21	24	3	3
	4							
	5							

Perc test done by: Zac Pearson (Insitz)  
William Filbacher (WCDOH)

Notes:

1. Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
2. Depth measurements to be made from top of hole. DO NOT REPORT INCREMENTS OF LESS THAN ONE INCH.

11/11

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH	HOLE NO. 29	HOLE NO. 30	HOLE NO. 31	HOLE NO. _____
G.L.	0" to 8"	0" to 8"	0" to 10"	
	Top Soil	Top Soil	Top Soil	
6"				
12"	8" to 30"	8" to 30"	10" to 30"	
18"	Yellow Brown	Yellow Brown	Yellow Brown	
24"	SANDY LOAM	SANDY LOAM	SANDY LOAM	
30"			30" to 43"	
36"			moderately	
42"			Compacted	
48"	30" to 84" (+)	30" to 84" (+)	Fine Grey	
54"	Light Grey	Light Grey	Sand	
60"	Fine/Medium	Fine/Medium	43" to 84" (+)	
66"	SAND	SAND	Light Grey	
72"			Fine/Medium	
78"			Sand	
84"				

WAS GROUNDWATER ENCOUNTERED NO  
 INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED N/A  
 INDICATED LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED N/A  
 DEEPEST MADE BY JOHN WATSON, PE (WSITE) DATE OF DEEP TESTS 7-18-07  
CHRISTIAN MARTINEZ (WCDOR), JOHN DRAKE (WCDOR)

DESIGN

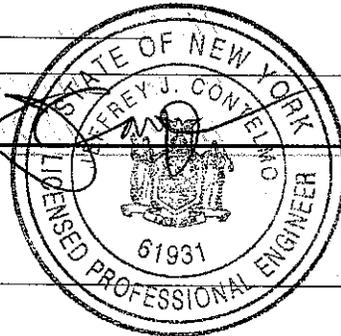
Soil Rate Used \_\_\_\_\_ Min/I" Drop: \_\_\_\_\_ S.D. Usable Area Provided \_\_\_\_\_

No. of Bedrooms \_\_\_\_\_ Septic Tank Capacity \_\_\_\_\_ Gals. Masonry \_\_\_\_\_ Metal \_\_\_\_\_

Absorption Area Prov. by \_\_\_\_\_ L.F. x 24" \_\_\_\_\_ width trench. Other \_\_\_\_\_

Name Jeffrey J. Contelmo, P.E.  
Insite Engineering, Surveying &  
 Address Landscape Architecture, P.C.  
3 Garrett Place  
Camel, New York 10512

Signature \_\_\_\_\_  
 Seal \_\_\_\_\_



Westchester County Health Department

Soil Rate Approved \_\_\_\_\_ Sq. Ft./Gal \_\_\_\_\_ Checked by \_\_\_\_\_

**APPENDIX B**

**WWTP Product Literature**





**purestream *ES***  
LLC  
*Advanced Environmental Treatment Systems*

# BESST

**BIOLOGICALLY ENGINEERED SINGLE SLUDGE TREATMENT**

*The latest  
technology in  
advanced biological  
wastewater treatment*

# BESST - brings cutting edge technology



## The Technology

**BESST™** (Biologically Engineered Single Sludge Treatment) is a Patent Pending process that is a culmination of activated sludge processes dating back to the 1920's. The **BESST** process is the most advanced wastewater treatment process available, and is the result of almost 60 years of research, development, practical experience and testing. Combining the principals of single sludge treatment for BOD<sub>5</sub>, TSS and nutrient removal, and sludge blanket clarification for efficient solids separation, this process places all the components into one vessel. The end result is a compact system that can be provided in either a steel package plant for smaller systems or built in place concrete systems for larger municipalities and high strength industrial waste streams. Either configuration provides an efficient, cost effective wastewater treatment plant with extremely low maintenance and operating costs. With its efficient use of mixed liquor, the **BESST** process requires less sludge wasting resulting in lower hauling costs for waste sludge.

The **BESST** process has no capacity limits, and is used in a wide range of applications. Plants serving development and municipal sectors, industrial, and food processing wastewaters, have been designed and are in highly successful operation throughout the US, Mexico, Central America and the Caribbean.



## The Process

The **BESST** process is based on Lawrence and McCarty biological kinetics and hydraulic models dating back to the early 1900's. Utilizing the benefits of Pre-Anoxic Single Sludge activated sludge process; the **BESST** system uses the endogenous carbon source found in all sanitary waste to denitrify in the anoxic zone without the use of methanol or other exogenous carbon sources. The raw wastewater enters the anoxic zone first where it is mixed with nitrified Return Activated Sludge from the sludge blanket clarifier. Submersible mechanical mixers are installed in the anoxic compartment to facilitate homogeneous mixing, and increase the denitrification efficiency. From here, the mixed liquor flows in a plug flow manner to the aeration zone where fine bubble diffusers provide the oxygen required for nitrification and BOD<sub>5</sub> reduction.



After aeration, the mixed liquor enters the bottom of the separation compartment where solids and treated effluent are separated by a patented velocity gradient sludge blanket clarifier. The operation of the velocity gradient sludge blanket clarifier is self-regulating. As the flow enters the bottom of the clarifier, a velocity gradient is created in such a way that the bottom 2 to 3 feet of solids are kept in a completely mixed state which eliminates the need for the operator to scrape the clarifier (solids will not bulk). While the solids rise, their velocity decreases creating a sludge based, fluidized bed filter, which removes fine and colloid particles from the treated effluent. Trapping these particles increases the weight of the solids, causing them to drop to the bottom of the clarifier, where they are returned to the anoxic zone by an airlift or mechanical pump. The internal circulation loop created by this plug flow is typically set at a minimum of four (4) times the average daily flow, increasing nitrification and denitrification dramatically.

The effluent weir is equipped with a scum baffle and scum skimmer which aids in the reduction of TSS in the effluent. The efficiency of the process, and velocity gradient sludge blanket clarifier, produces effluent quality well below 10 mg/l BOD<sub>5</sub>, <10 mg/l TSS, less than 1 mg/l ammonia, less than 10 mg/l total nitrogen (<5 mg/l TKN) and effluent phosphorous levels between 2 and 3 mg/l by "Luxury Uptake" and less than 0.5 mg/l with the use of metal salts.

# to advanced biological wastewater treatment



## The Features & Benefits

**BESST** technology incorporates many innovative and advanced features that increase its efficiency and reduces both capital and operational costs.

### 1. Mechanical Reliability

The **BESST** process is designed with 100% backup of all electromechanical equipment and failsafe controls. This ensures reliability of operation even when there is a mechanical failure.

### 2. Single Sludge Treatment

Of the three methods of single sludge treatment, the Pre-Anoxic method is the most efficient and effective method for nutrient removal and mixed liquor stabilization. By designing the **BESST** process with the anoxic zone as the first compartment to receive wastewater, the sludge becomes more stable and has better settling qualities than typical activated sludge processes, resulting in a lower SVI which equates to better settling sludge. This increase in sludge settleability increases the efficiency of the sludge blanket clarifier and aids in achieving between 4% and 6% solids in the sludge storage tank, reducing sludge hauling costs dramatically. In addition, the raw wastewater entering the anoxic zone provides the endogenous carbon source required for denitrification. No addition of exogenous carbon is needed to achieve Total Nitrogen levels below 10 mg/l and Total Kjeldahl Nitrogen less than 5 mg/l. The aeration chamber is designed for efficient BOD<sub>5</sub> and TSS removal to levels less than 10 mg/l, and with dissolved oxygen levels between 2.0 mg/l and 3.5 mg/l, the nitrification rate is extremely high, resulting in ammonia levels below 1 mg/l.

### 3. Mixed Liquor Suspended Solids (MLSS) Concentrations

The **BESST** process is designed to operate at MLSS concen-

trations well above the typical levels for other activated sludge processes. With a design range between 3000 mg/l and 6000 mg/l, more microbial cells are available to “feed” on a wider range of organic material in the waste stream, including some previously considered non-biodegradable.

### 4. Reduced Capital Costs

The efficiency of the **BESST** process is not only in the biology and hydraulics, but in the construction as well. By integrating all of the components into one tank, the installation costs and capital costs are reduced dramatically. In many cases by more than 40% when compared to other activated sludge processes. In addition to the upfront savings, the **BESST** process also reduces operating costs by as much as 50%. By maximizing the biological engineering and utilizing the mixed liquor to its fullest potential, less sludge is wasted from the system reducing hauling costs by up to 75%, and lower horsepower electrical components are required for operation resulting in lower electric costs.

### 5. No Odor

The stability and age of the sludge, combined with the aerobic conditions, result in a process with NO UNPLEASANT ODORS. This enables the process to be installed in locations in close proximity to populated areas without the need for costly buildings or tank coverings.

### 6. Hydraulic Flexibility

The velocity gradient sludge blanket clarifier’s half triangle design is the most efficient design for solids separation. By taking peak flows into account at the design stage, the clarifier can hydraulically withstand a continuous peak of up to 3 times the design flow. This allows for instantaneous peaks of up to 1200% of the design flow for up to 2 hours. The sludge based fluidized bed is also self regulating in these peak conditions, as the flow increases, the sludge rises in the clarifier and expands increasing both the filtration volume and surface area.

### 7. Modular and Flexible Design

The small footprint and single tank design allows for easy expansion for future needs of the community or development. By placing the package plant design in parallel allows for additional tankage to be easily added as flow demands increase. The efficiency of the **BESST** design also lends itself well to retrofits, often times increasing the treated flow capacities by as much as 20% without the need for additional tankage.



# BESST

BIOLOGICALLY ENGINEERED SINGLE SLUDGE TREATMENT

## Special Applications

Although the **BESST** process can be applied successfully to all biologically degradable wastewaters, with minimal operator attention, it is especially suited for the following applications:

1. Environmentally sensitive areas requiring advanced treatment, such as:
  - Golf Course Communities
  - Resort Areas
  - Commercial Fishing Areas
2. Highly Variable daily hydraulic flow patterns found in:
  - Subdivisions
  - Schools
  - Small Communities
  - Shopping Centers
  - Campgrounds
3. Unusually strong and/or variable organic loads created by industrial wastes, such as:
  - Food Processing (Meat, Poultry, Vegetable....)
  - Dairies
  - Tanneries and Textile Mills



**purestream ES**  
LLC  
*Advanced Environmental Treatment Systems*

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