

CAPACITY EVALUATION

For the Wastewater Management System
at Coleytown Elementary School

at 65 Easton Road
Westport, Connecticut

Prepared for the Town of Westport
Board of Education

Rev. December 17, 2024



LANDTECH

**CAPACITY EVALUATION
WASTEWATER MANAGEMENT SYSTEM
COLEYTOWN ELEMENTARY SCHOOL
65 EASTON ROAD
WESTPORT, CONNECTICUT
REV. DECEMBER 17, 2024**

The Westport Board of Education proposes to construct a new elementary school on property it owns on Easton Road in Westport, Connecticut. The property currently supports an elementary school and a middle school plus athletic fields, paved parking, etc. typical of school properties. The new school is to be in the same general location as the existing elementary school.

Both schools currently on the property are served by a total of four septic systems. A site plan based on a land survey made in 2000 is attached as an appendix.

The purpose of this report is to present information concerning the maximum average daily wastewater flow that the site's existing septic systems can accept and for which the Connecticut Department of Public Health (DPH) can reasonably be expected to issue a permit for a new school.

Currently the regulatory jurisdiction for the property falls with the DPH, acting through the Aspetuck Health District. Jurisdiction was with the Connecticut Department of Energy and Environmental Protection (DEEP) until January 1, 2017. We were unable to obtain copies of permits for the property from the DEEP.

Elementary School

From our review of DEEP file documents, the main leaching area located just south of the building comprises 1940 linear feet of 36-inch trenches. As shown on the site map (in appendix), there are also two smaller leaching areas serving the school. Use of these as part of a new school would be difficult to accomplish because of the complicated plumbing and difficulty in ensuring the correct amount of flow to each. The two small systems would also restrict the location of the new school if they remained in use. We have assumed these two small systems are to be abandoned.

The design discharge of the existing system is unknown, but using an assumed percolation rate of 1"/20 min. and corresponding application rate values from the DPH Technical Standards, the approximate capacity would be 4074 gpd. This figure is not reliable without soil testing within the existing leaching area.

Based on water meter readings made between September 2021 and April 2022, the Elementary School used about 2966 gallons per day (gpd). During that period the student population was 522.

The system may theoretically accept an additional 1108 gpd, but this will not be accepted by the DPH without further soil testing, as it is based on an assumed value for percolation and includes no safety factor. A more reasonable expectation is that discharging not more than 2966 gpd to the system from the new building would be acceptable to the DPH, as it presents no increase in flow to the system. Recent conversations with DPH have confirmed that continuing use of the existing system without

additional soil testing, in other words a new school restricted to 522 students, could be approved by DPH without additional soil testing. Any increase in the student population would require compliance with DPH standards.

Middle School

From our review of DEEP file documents, we believe the system at the Middle School has a design discharge of 4725 gallons per day (gpd). As shown on the site map (in appendix), the leaching area comprises 846 linear feet of 4x4 concrete galleries. The design was based on a projected student population of 700 with a 50% safety factor applied to the flow rate. The student population in 2002 was 431.

Based on water meter readings from October 2021 through April 2022, the Middle School used about 2473 gallons per day (gpd), so the system could theoretically accept an additional 2252 gpd before exceeding the limit under the original permit. Recent conversations with DPH have confirmed that the DEEP permit limit of 4725 gpd will be honored by DPH so long as there are no additions to the school and the student population does not exceed 700.

System Expansion

To determine the feasibility of expanding the Elementary School system to the north in an area currently used for athletic fields, we observed the excavation of five test holes and made a percolation test. Test hole logs and percolation test data appear in an appendix.

The field work shows a small area of suitable soil extending from the northern end of the existing system about 150 ft and west about 200 ft toward the property line. We do not recommend using this area, however, because the flow from such an expansion area may conflict with flow from the Middle School. It is likely that the DPH would require a time-consuming and expensive groundwater investigation to demonstrate that the area could accept flow from both systems.

Conclusions and Recommendations

The system at the Elementary School has the capacity to accept wastewater from the present population of 522 students.

Use of the existing system without expansion to accept wastewater from more than 522 students would require either soil test data made as part of the original system design or new soil testing showing compliance with DPH standards.

Expansion of the existing Elementary School septic system can reasonably be expected to be problematic from a regulatory viewpoint and from a performance viewpoint.

The system at the Middle School has the capacity to accept wastewater from the present student population plus an additional 2252 gpd under the conditions of the previous DEEP permit. This is would represent an increase in student population up to 700.

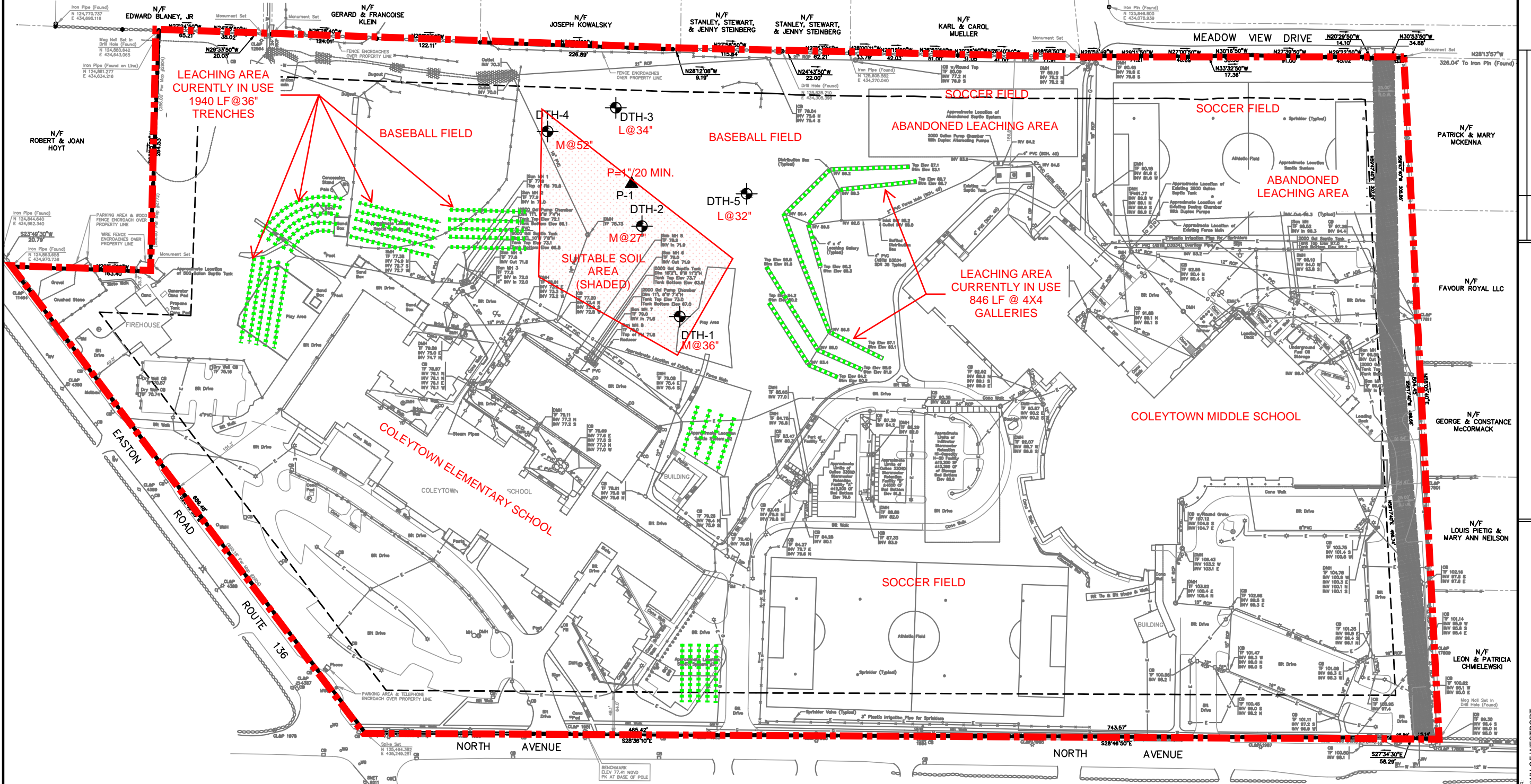
Options

Alternative A: Construct a new school and limit its student population to the 2022 number (522 students), well below the 2030 projection of 455.

Alternative B: Conduct additional soil testing in the vicinity of the existing Elementary School's leaching area to determine whether it could be shown to be able to accept enough wastewater to support additional students. This would include evaluation of soils within the leaching areas and must be conducted when school is not in session. This would also include a groundwater study to verify that there is adequate hydraulic capacity to accept wastewater from a larger system.

Alternative C: Discharge the maximum amount of wastewater to the existing elementary school system and convey additional flow from the Elementary School into the Middle School leaching area such that the total flow to the Middle School would not exceed 4725 gpd. This option represents the largest student population that could be supported by the site. It would, however, present the most problematic option from a regulatory viewpoint. The DPH would be concerned about the ability to split the Elementary School flows accurately. Also, the DPH would interpret the additional flow conveyed to the Middle School as an addition to the Middle School and would require compliance with the Technical Standards. This option would also be problematic from an operations viewpoint. As the elementary students move up to the Middle School, the flow from the Elementary School to the Middle School would have to be reduced or discontinued. This option is not recommended.

APPENDIX A:
SITE MAP



SCALE IN FEET



**Existing Septic Systems
at
Coleytown Elementary School
and
Coleytown Middle School**

| NO. | REVISION | DATE |
|-----|----------|------|
| | | |
| | | |
| | | |
| | | |

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PREPARED FOR: TOWN OF WESTPORT
 PROJECT LOCATION: 65 EASTON ROAD, WESTPORT, CT
 TITLE: SITE IMPROVEMENTS FOR A PROPOSED SEPTIC SYSTEM
 DRAWING TITLE

| | |
|----------------------|-----------------|
| PROJECT No. 24175-01 | DATE 11/19/2024 |
| SCALE 1" = 120' | DESIGNED BY SM |
| CHECKED BY MB | |

**SITE
MAP**

APPENDIX B:

WATER USE

Coleytown Middle School

65 Easton Road

Westport, Connecticut

Revised: 8/29/2022

Daily Design Flow Calculation for Septic System

Flow Based on Information from First Taxing District Flows:

| Month | Flow | School Days | Flow/Day |
|--|--------------------|--------------------|-----------------|
| Flow January 2018 | 47,000.00 gallons | 20 | 2,350.00 g.p.d |
| Flow February 2018 | 52,000.00 gallons | 15 | 3,466.67 g.p.d |
| Flow March 2018 | 37,000.00 gallons | 21 | 1,761.90 g.p.d |
| Flow April 2018 | 47,000.00 gallons | 16 | 2,937.50 g.p.d |
| Flow May 2018 | 63,000.00 gallons | 22 | 2,863.64 g.p.d |
| Flow September 2018 (Recorded Flow 234,000 gallons*) | 47,500.00 gallons | 17 | 2,794.12 g.p.d |
| Flow October 2018 (Recorded Flow 136,000 gallons*) | 47,500.00 gallons | 23 | 2,065.22 g.p.d |
| Flow November 2018 | 20,000.00 gallons | 18 | 1,111.11 g.p.d |
| Flow September 2019 | 74,000.00 gallons | 19 | 3,894.74 g.p.d |
| Flow October 2019 | 73,000.00 gallons | 22 | 3,318.18 g.p.d |
| Flow November 2019 | 31,000.00 gallons | 17 | 1,823.53 g.p.d |
| Flow October 2021 (Recorded Flow 167,000 gallons*) | 47,500.00 gallons | 21 | 2,261.90 g.p.d |
| Flow November 2021 | 86,000.00 gallons | 19 | 4,526.32 g.p.d |
| Flow December 2021 | 40,000.00 gallons | 17 | 2,352.94 g.p.d |
| Flow January 2022 | 26,000.00 gallons | 19 | 1,368.42 g.p.d |
| Flow February 2022 | 37,000.00 gallons | 14 | 2,642.86 g.p.d |
| Flow March 2022 | 37,000.00 gallons | 23 | 1,608.70 g.p.d |
| Flow April 2022 | 43,000.00 gallons | 15 | 2,866.67 g.p.d |
| Average Daily Flow: | 2,556 g.p.d | | |
| Factor of Safety | 50% | | |
| Average Daily Design Flow: | 3,835 g.p.d | | |

Cafeteria Flows Based on Connecticut Public Health Code:

| | |
|---|---------------------|
| Flow per Student | 9.00 g.p.d. |
| Total Number of Students | 431 Students |
| Average Daily Design Flow (Health Code): | 3,879 g.p.d |

Flow Comparison:

| | |
|---|--------------------|
| Average Daily Design Flow (Aquarion): | 3,835 g.p.d |
| Average Daily Design Flow (Health Code): | 3,879 g.p.d |

* Recorded flow abnormal circumstance average flow used in place of recorded flow

Coleytown Elementary School

65 Easton Road

Westport, Connecticut

Revised: 8/29/2022

Daily Design Flow Calculation for Septic System

Flow Based on Information from Aquarion Water Company:

| Month | Flow | School Days | Flow/Day |
|---|--------------------|--------------------|-----------------|
| Flow January 2018 | 34,000.00 gallons | 20 | 1,700.00 g.p.d |
| Flow February 2018 | 51,000.00 gallons | 15 | 3,400.00 g.p.d |
| Flow March 2018 | 32,000.00 gallons | 21 | 1,523.81 g.p.d |
| Flow April 2018 | 40,000.00 gallons | 16 | 2,500.00 g.p.d |
| Flow May 2018 | 51,000.00 gallons | 22 | 2,318.18 g.p.d |
| Flow September 2018 | 31,000.00 gallons | 17 | 1,823.53 g.p.d |
| Flow October 2018 | 91,000.00 gallons | 23 | 3,956.52 g.p.d |
| Flow Novemebr 2018 | 56,000.00 gallons | 18 | 3,111.11 g.p.d |
| Flow December 2018 | 60,000.00 gallons | 15 | 4,000.00 g.p.d |
| Flow January 2019 | 40,000.00 gallons | 21 | 1,904.76 g.p.d |
| Flow February 2019 | 55,000.00 gallons | 14 | 3,928.57 g.p.d |
| Flow March 2019 | 39,000.00 gallons | 21 | 1,857.14 g.p.d |
| Flow April 2019 | 53,000.00 gallons | 17 | 3,117.65 g.p.d |
| Flow May 2019 | 47,000.00 gallons | 22 | 2,136.36 g.p.d |
| Flow September 2019 | 48,000.00 gallons | 19 | 2,526.32 g.p.d |
| Flow October 2019 | 66,000.00 gallons | 22 | 3,000.00 g.p.d |
| Flow November 2019 (Recorded Flow 104,000 gallons*) | 51,400.00 gallons | 17 | 3,023.53 g.p.d |
| Flow December 2019 (Recorded Flow 131,000 gallons*) | 51,400.00 gallons | 15 | 3,426.67 g.p.d |
| Flow January 2020 (Recorded Flow 202,000 gallons*) | 51,400.00 gallons | 21 | 2,447.62 g.p.d |
| Flow February 2020 | 55,000.00 gallons | 15 | 3,666.67 g.p.d |
| Flow September 2021 | 59,000.00 gallons | 19 | 3,105.26 g.p.d |
| Flow October 2021 | 61,000.00 gallons | 21 | 2,904.76 g.p.d |
| Flow November 2021 | 55,000.00 gallons | 19 | 2,894.74 g.p.d |
| Flow December 2021 | 61,000.00 gallons | 17 | 3,588.24 g.p.d |
| Flow January 2022 | 35,000.00 gallons | 19 | 1,842.11 g.p.d |
| Flow February 2022 | 57,000.00 gallons | 14 | 4,071.43 g.p.d |
| Flow March 2022 | 47,000.00 gallons | 23 | 2,043.48 g.p.d |
| Flow April 2022 | 61,000.00 gallons | 15 | 4,066.67 g.p.d |
| Average Daily Flow: | 2,853 g.p.d | | |
| Factor of Safety | 50% | | |
| Average Daily Design Flow (Aquarion): | 4,280 g.p.d | | |

Cafeteria Flows Based on Connecticut Public Health Code:

| | |
|---|---------------------|
| Flow per Student | 9.00 g.p.d. |
| Total Number of Students | 522 Students |
| Average Daily Design Flow (Health Code): | 4,698 g.p.d |

Flow Comparison:

| | |
|---|--------------------|
| Average Daily Design Flow (Aquarion): | 4,280 g.p.d |
| Average Daily Design Flow (Health Code): | 4,698 g.p.d |

* Recorded flow abnormal circumstance average flow used in place of recorded flow

APPENDIX C:
SOIL TESTING

CONDUCTED ON SEPTEMBER 20, 2024

TEST HOLE 1

0 – 9" TOPSOIL
9 – 22" BROWN SILTY LOAM
22 - 36" ORANGE BROWN SANDY LOAM
36 - 72" GREY SAND AND GRAVEL
ROOTS TO 36"
MOTTLING @ 36", NO GROUNDWATER, LEDGE @ 72"
RESTRICTIVE LAYER @ 36"

TEST HOLE 2

0 – 12" TOPSOIL
12 – 27" ORANGE BROWN SANDY LOAM
27 - 39" GREY SAND AND GRAVEL
NO ROOTS
MOTTLING @ 27", NO GROUNDWATER, LEDGE @ 39"
RESTRICTIVE LAYER @ 27"

TEST HOLE 3

0 – 14" TOPSOIL
14 – 34" BROWN SANDY LOAM
NO ROOTS
NO MOTTLING, NO GROUNDWATER, LEDGE @ 34"
RESTRICTIVE LAYER @ 34"

TEST HOLE 4

0 – 12" TOPSOIL
12 – 22" BROWN SANDY LOAM
22 - 39" ORANGE BROWN SANDY LOAM
39 – 52" BROWN SANDY LOAM
52 - 64" ORANGE BROWN SILTY LOAM
64 – 88" GREY SAND AND GRAVEL
NO ROOTS
MOTTLING @ 52", NO GROUNDWATER, NO LEDGE
RESTRICTIVE LAYER @ 52"

TEST HOLE 5

0 – 11" TOPSOIL
11 – 32" SAND AND GRAVEL
NO ROOTS
NO MOTTLING NO GROUNDWATER, LEDGE @ 32"
RESTRICTIVE LAYER @ 32"

PERCOLATION TEST DATA

Perc Hole 1 Date: 9/20/2024

Depth: 22 in. Presoak: 1 hr

| Time | Depth (in.) | Drop (in.) | Interval (min.) | Rate (min./in.) |
|-------|----------------|---------------|--------------------|--------------------|
| 10:45 | 2.50 | | | |
| 10:55 | 6.50 | 4.00 | 00:10 | 2.50 |
| 11:05 | 8.50 | 2.00 | 00:10 | 5.00 |
| 11:15 | 10.50 | 2.00 | 00:10 | 5.00 |
| 11:25 | 11.50 | 1.00 | 00:10 | 10.00 |
| 11:35 | 12.00 | 0.50 | 00:10 | 20.00 |
| 11:45 | 12.50 | 0.50 | 00:10 | 20.00 |

Final Rate: 1" in 20.00 minutes