MW4 SUBSURFACE EXPLORATION PROGRAM

ON-SITE SEWAGE TREATMENT SYSTEM

PARID 641743080828

Mayo Woodlands Fourth

ROCHESTER TOWNSHIP

March 23, 2021

Prepared for:
Ed Clark
Clark Development, LLC
36 Wood Lake Drive SE
Rochester, MN 55904

WSB PROJECT NO. 015630-000

wsb

March 23, 2021

Clark Development, LLC
36 Wood Lake Drive SE
Rochester, MN 55904

Re: Drainfield Design Mayo Woodlands Fourth
WSB Project No 015630-000
PARID 641743080828

Dear Ed:

In accordance with your written authorization, we have designed an On-Site Sewage Treatment System for the referenced project. We are sending you a copy of our report.

If you have any questions concerning this report or we can be of further assistance, please contact us.

Sincerely,

WSB

Daniel J. Zemke, PE
MPCA Advanced
Designer License No. 3679

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I. INTRODUCTION

In accordance with the written authorization of Ed Clark, WSB has completed six soil borings on the outlot C in the proposed subdivision. The parcel is proposed to be subdivided into 15 lots that will be served by a sewer collection system. The cluster lots range in size from 0.50 to 0.56 acres This system is to be installed by the subdivision owner and the number of bedrooms will be limited so that the total design flow of this system is less than 10,000 gpd. The parcel is located in Section 17 Township 106 North, Range 14 West. The majority of the property was previously agricultural land and has a general slope of 1% to 10% to the North. This area was taken out of agricultural production in 2002 when the Mayo Woodlands was platted. The parcel is located in Rochester Township in Olmsted County, Minnesota. Our authorized scope of work on this project is limited to:

1. Exploration and review of the subsurface soil and water conditions at selected locations.

2. Preparation of logs depicting the subsurface conditions encountered at the soil test probes locations.

3. Preparation of a data report including the results of the field tests, as well as a review of the conditions encountered with recommendations and opinions for construction of a new on-site sewage treatment system.

Our work program for accomplishment of the above objectives included soil test probes, observation of soils, preparation of logs depicting the subsurface conditions, and review of the information available on this parcel. This report describes our observations, presents the results of field tests, and provides you with our engineering review of the information.

II. EXPLORATION PROGRAM RESULTS

Surface Conditions
The soil survey for the site indicates the following soils are present:

Olmsted County Soil Survey Data				
Map Unit	***Soil Texture***	***% Slope***	***Permeability (in/hr)***	***Drainage Class***
401B	Silt Loam	2-6	0.6-2.0	Well Drained
401C2	Silt Loam	6-12	0.6-2.0	Well Drained
489A	Silt Loam	0-1	0.0	Well Drained
493B	Loam	2-6	0.57-1.98	Well Drained
493C	Loam	6-12	0.57-1.98	Well Drained
593E	Silt Loam	18-30	0.14-0.57	Well Drained

Additional information can be found in Appendix A.

Subsurface Conditions

The subsurface conditions encountered at the soil borings are illustrated by means of the attached logs. It should be noted that the subsurface conditions at other times and locations on this site may differ from those found at the test locations. If different conditions are encountered during construction, it is necessary that you contact us so that we can review our recommendations. The soil boring logs are included in Appendix B.

A review of the soil test probes put down at this site indicates a general profile of silt loam over sandy loam. The soil test probes were extended to “mottles” or 60”.

Water Level Observations

Observations for subsurface water were made during completion of the soil probes. We also observed the soils for mottling and other evidence of a seasonally high-water table. Mottling was encountered at several of the soil test probes. You should be aware that subsurface water conditions can be expected to occur with seasonal changes.

III. PROJECT INFORMATION

We understand the project under consideration is to provide a drainfield area large enough to treat up to 10,000 gallons per day. On the treatment system that will be constructed for the cluster system six soil probes have been done and additional will need to be performed prior to the permit being issued. The design assumes that 24” of good soils are present and 12” of sand are provided in the mound design.

The above information represents the parameters used for the design and calculations of the sewage treatment system. If this information is changed, we request that we be contacted for further review.

The design for the cluster system will use pressurized mounds.

IV. ENGINEERING REVIEW

In our opinion, the exploration and testing performed has identified a site that will require a pressurized mound system for the cluster systems. This requires a soil sizing factor of 0.45 gpd/ft. Attached to this report is a summary of the drainfield requirements outlining the site-specific treatment system. The mounds will contain double rock beds in each mound and the rock beds will be separated by 14’. The mounds will employ pressurized distribution powered by a duplex pump station. A 4 way pressurized distribution valve will be installed on each pump to dose all of the eight beds.

The installation and design of the on-site treatment system should be in accordance with current county and state codes. It is necessary that careful construction techniques be used, such as limiting traffic upon the soils where treatment systems are proposed.

It is important to recognize that adequate performance and treatment of the system is dependent upon the construction techniques, as well as maintenance by the owner(s). We suggest the owner(s) be made aware of the required maintenance, as well as observations done during construction.

V. FIELD EXPLORATION PROCEDURES

Soil Borings
Six (6) soil test probes were put down on outlot C. The soil test probes were sampled at the locations indicated on the attached site sketch. Additional borings will need to be done prior to the cluster system being permitted. The soil probes were backfilled with on-site material and some settlement of these materials may occur. Final closure of the soil probes is the responsibility of the owner.

Soil Sampling
Soil test probes were excavated with a hand probe and our determination of the depth and extent of the various layers of soil and the consistency of the soils are only approximate.

As the soil samples were obtained in the field, they were visually and manually classified by WSB personnel in accordance with the USDA classification system. Representative portions of the samples were then returned to the laboratory for further examination and for verification of the field classification. A log of the soil probes indicating the depth and identification for the various strata is attached.

VI. STANDARD CARE

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted engineering practices at this time and location. Other than this, no warranty is implied or intended.

Continual maintenance, proper installation, and individual usage of an on-site treatment facility will affect its performance.

Prepared by:

Daniel J. Zemke, PE

APPENDIX A
Preliminary Plat
(11x17 Reduction)

APPENDIX B
Soil Boring Logs

University of Minnesota
Onsite Sewage Treatment Program

Soil Observation Log

Project ID: v 04.17.2018

Client:	Clark Development	Location / Address:	Mayo Woodlands fourth

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☑ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope — Slope shape: Convex, Convex

Vegetation:	Grass	Soil survey map units:	401B	Slope %:	1.0	Elevation:	1258

Weather Conditions/Time of Day:	Cloudy 34	Date	03/16/21

Observation #/Location:	SP#1	Observation Type:	Probe

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
							Shape	Grade	Consistence
0-12	Silt Loam	<35%	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
12-18	Silt Loam	<35%	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
18-22	Silty Clay Loam	<35%	10YR 4/4	10YR 5/6	Concentrations, depletions,	S1	Blocky	Weak	Firm

Comments

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

(Designer/Inspector) (Signature) (License #) (Date)

Additional Soil Observation Logs

Project ID:

University of Minnesota Onsite Sewage Treatment Program

Client	**Clark Development**	Location / Address:	Mayo Woodlands fourth

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☑ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope — Slope shape: Linear, Linear

Vegetation:	Grass	Soil survey map units:	401B	Slope %:	3.0	Elevation:	1258

Weather Conditions/Time of Day:	Cloudy 34	Date:	03/16/21

Observation #/Location:	SP #2	Observation Type:	Probe

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I Shape	Grade	Consistence
0-12	Silt Loam	<35%	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
12-36	Silt Loam	<35%	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
36-48	Loamy Sand	<35%	10YR 4/4	N/A	N/A	N/A	Single grain	Structureless	Loose
48-54	Silty Clay Loam	<35%	10YR 4/4	10YR 5/6	Concentrations, depletions,	S1	Blocky	Weak	Friable

Comments	

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID: v 04.17.2018

Client:	**Clark Development**	Location / Address:	Mayo Woodlands fourth

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☑ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☑ Shoulder ☐ Back/Side Slope ☐ Foot Slope ☐ Toe Slope

Slope shape	Linear, Linear						
Vegetation:	Grass	Soil survey map units:	401B	Slope %:	1.0	Elevation (ft):	1260
Weather Conditions/Time of Day:	Cloudy 34				Date:	03/16/21	
Observation #/Location:	SP#3			Observation Type:		Probe	

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
							Shape	Grade	Consistence
0-12	Silt Loam	<35%	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
12-24	Silt Loam	<35%	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
24-60	Loamy Sand	<35%	10YR 4/4	N/A	N/A	N/A	Single grain	Structureless	Loose

Comments

Additional Soil Observation Logs

Project ID:

University of Minnesota Onsite Sewage Treatment Program

Client:	Ed Clark	Location / Address:	Mayo Woodlands 4th

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☑ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope — Slope shape: Linear, Linear

Vegetation:	Grass	Soil survey map units:	401B	Slope %:	3.0	Elevation (ft):	1257.5

Weather Conditions/Time of Day:	Cloudy 34	Date:	03/16/21

Observation #/Location:	SP#4	Observation Type:	Probe

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
							Shape	Grade	Consistence
0-18	Silt Loam	<35%	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
18-36	Silt Loam	<35%	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
36--60	Loamy Sand	<35%	10YR 4/4	N/A	N/A	N/A	Single grain	Structureless	Loose

Comments

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID: v 04.17.2018

Client:	**Ed Clark**	Location / Address:	Mayo Woodlands

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☑ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☐ Back/Side Slope ☑ Foot Slope ☐ Toe Slope — Slope shape: Linear, Linear

Vegetation:	Grass	Soil survey map units:	401B	Slope %:	2.0	Elevation (ft):	1258
Weather Conditions/Time of Day:	Cloudy 34				Date:	03/16/21	
Observation #/Location:	SP#5			Observation Type:		Probe	

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I Shape	Grade	Consistence
0-18	Silt Loam	<35%	10YR 3/2	N/A	N/A	S1	Blocky	Moderate	Friable
18-36	Silt Loam	<35%	10YR 4/4	N/A	N/A	S1	Blocky	Moderate	Friable
36-60	Loamy Sand	<35%	10YR 4/4	N/A	N/A	S1	Single grain	Structureless	Loose

Comments

Additional Soil Observation Logs

Project ID:

University of Minnesota Onsite Sewage Treatment Program

Client:	**Ed Clark**	Location / Address:	Mayo Woodlands		
Soil parent material(s): (Check all that apply)	☐ Outwash ☐ Lacustrine ☑ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter				
Landscape Position: (check one)	☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope	Slope shape	Linear, Linear		
Vegetation:	Grass	Soil survey map units:	401B	Slope %:	2.0
Elevation (ft):	1257				
Weather Conditions/Time of Day:	Cloudy 34	Date:	03/16/21		
Observation #/Location:	SP#6	Observation Type:	Probe		

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure		
							Shape	Grade	Consistence
0-18	Silt Loam	<35%	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
18-60	Loamy Sand	<35%	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable

Comments