GWI
GroundWater Investigations LLC · 11590 Black Forest Rd. 614 N Suite 15 · Colorado Springs, CO 80908 · (719) 338-1805

To: Dan Andres

Date: April 9 2021

From: Julia M. Murphy, MS PG
Hydrogeologist/Professional Geologist

RE: Onsite Wastewater Treatment System Report, Circle A Subdivision Revised

PROJECT DESCRIPTION

The following presents the Soils and Geology Evaluation for the 14.9 Acre parcel located in the Southwest 1/4 of the Northeast ¼ of Section 23, Township 11 South, Range 65 West, of the 6th P.M. ("Property"). The Property is situated within the Kiowa Bijou Designated Groundwater Basin with the address 17110 E. Goshawk Road, Colorado Springs, CO 80908 in El Paso County (Figure 1).

The Project Site is 14.9 acres of land to be subdivided into 3 single- family residential RR-5 lots (Figure 2). Lot 1 is comprised of 4.957 acres, Lot 2 is 4.96 ACRES and Lot 3 will be 4.95 acres. There is an existing home on Lot 1 with an existing well and individual non-evaporative septic system. The soils at vacant Lots 2 and 3 are addressed herein with regard to soil investigations as it applies to proposed residential structures and septic system suitability. The water supply for lots 2 and 3 will be from individual wells, and wastewater will be treated by individual non-evaporative septic systems.

SOILS - NRCS

The National Resource Conservation Service (NRCS) identified two soil types with a northwest trend on the Property.

Type	Description	Percent Coverage
25	Elbeth Sandy Loam , 3 to 8 percent slopes	96
92	Tomah-Crowfoot Loamy sands 3 to 8 percent	4

Attachment 1 provides a complete description of the soils. All proposed buildable land is located within the area identified as Elbeth Sandy Loam. This drainage class is described as

well drained and in Hydrologic Soil Group B which is defined as having a moderate infiltration rate and moderately fine to course textures. Runoff potential is medium. Samples discussed below indicate the upper eight feet of soils is comprised of interbedded sandy clay, sandy loam and sandy clay loam. Soils are derived from the Dawson formation which include arkosic sands with interbedded clay (Attachment 1).

OWTS Summary of Results

Field soils investigations at the Project Site consisted of excavating five profile pits at Lot 2 (Site 1) and two profile pits at Lot 3 (Site 2) to evaluate suitability for Onsite Wastewater Treatment System (OWTS). In addition, two soil test borings, one on each of Lots 2 and 3, were drilled for foundation design.

The OWTS profile pits were excavated to a maximum depth of 8.5 feet below ground surface. Samples were collected from select intervals and were classified according to the U.S. Department of Agriculture soil classification system. Soil evaluation results for samples collected at Lot 2 identified Soil Type 4A (Ltr = 0.15), a massive sandy clay, was encountered in Test Pits 1, 2, 3, and 5 at a depth within the treatment zone that would require an Engineered OWTS. However, at the location of Test Pit 4, a suitable Sandy Clay Loam Type 3 (Ltr=0.35) was encountered in the treatment zone identifying this location suitable for a conventional OWTS (Table 1). Soil evaluation results for samples collected at Lot 3 identified Soil Type 3 (Ltr=0.35) described as a Sandy Clay Loam and was identified as being a suitable location for a conventional OWTS . Attachment 2 presents the comprehensive signed Engineering Reports and the details of the test pit results for the evaluation of OWTS suitability.

CONCLUSION

The Project Site is compatible with the proposed development of single-family rural residential lots. The OWTS for Lot 2 was identified as requiring an engineered individual wastewater treatment system at 4 of 5 test pit locations and suitable for a conventional OWTS at one location. The proposed location of the conventional OWTS location and an alternative location is

shown on Figure 5. The primary OWTS location at Lot 3 was identified as being suitable for a conventional system. Geologic hazards were not identified at the Project Site that would inhibit the proposed expansion of rural residential use. However, expansive soils were identified on Lot 2 which can be mitigated by standard engineering practices.

CDSS
Colorado's Decision Support Systems

Location Circle A Subdivision

Legend

County

Location

Notes

CIRCLE A SUBDIVISION
SW1/4 NE1/4 SEC 23 T11S R65W

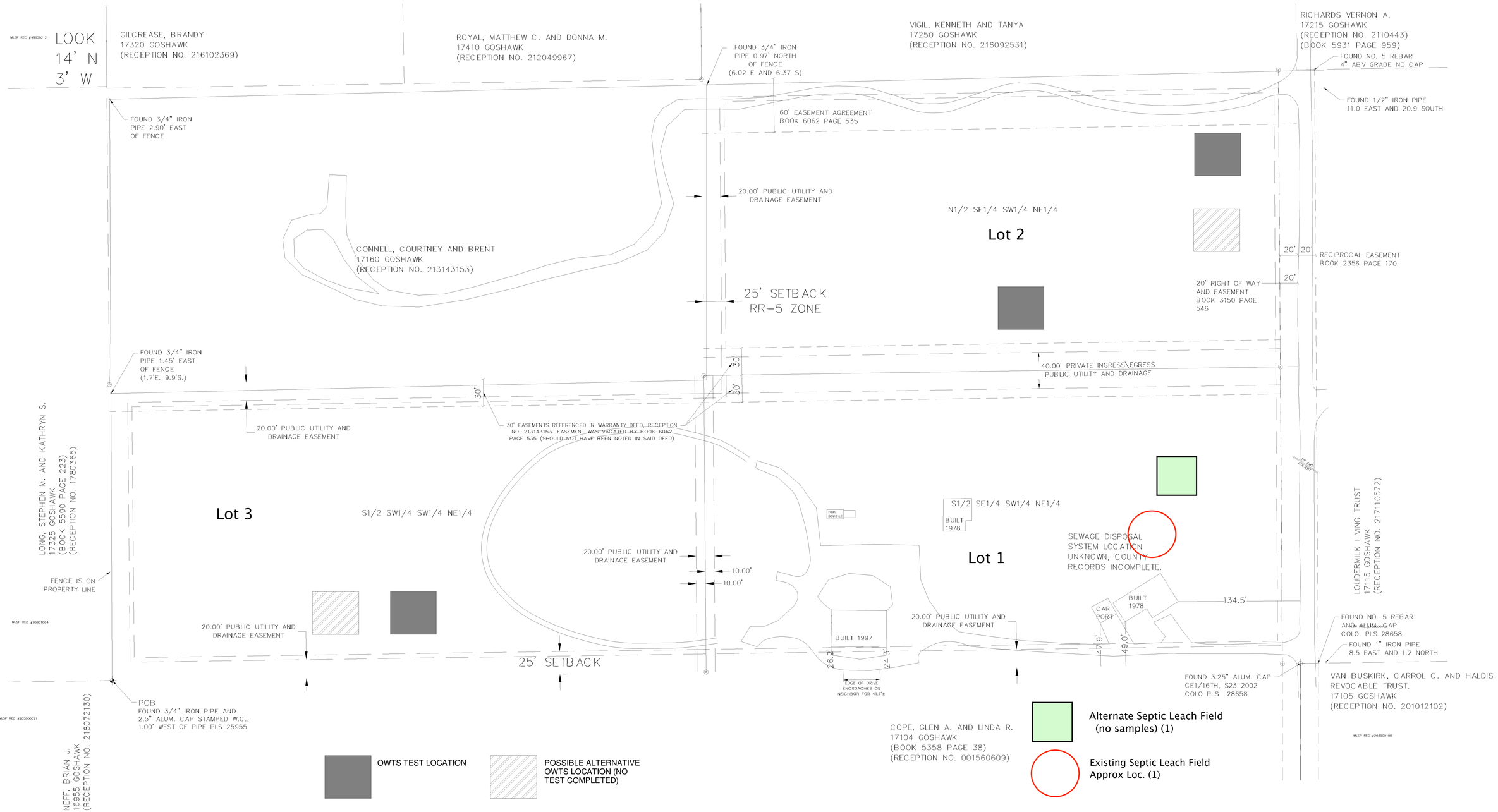
FIGURE 1

2,339 0 1,169 2,339 Feet

1: 14,032

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Date Prepared: 8/16/2019 2:22:14 PM



OWTS LOCATION PROVIDED BY PARR ENGINEERING & CONSULTING, INC. SITE MAP PROVIDED BY M&S CIVIL CONSULTANTS, INC.

(1) Modified by GWI

FIGURE 2

(1) 01 - OWTS Locations
1" = 50'-0"

Parr Engineering & Consulting, Inc.
11590 Black Forest Road, Suite 10
Colorado Springs, Colorado 80908
Phone: 719-494-0404

OWTS SITE MAP

LEGAL DESCRIPTION: THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER, THE NORTH HALF OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 23, ALL IN TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO

JN:	19.203
SCALE:	1" = 50'-0"
ISSUE DATE:	08/19/19
DSG BY:	D.MIZICKO
CHK BY:	D.MIZICKO

REVISION:	
DATE:	
DRW BY:	
CHK BY:	
REVISION:	
DATE:	
DRW BY:	
CHK BY:	

TABLE 1
OTWS PROFILE TEST PITS LOT 2

Profile Pit 1 — Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	2.5Y 4/6 (Moist)
4	■							
6								

Total Depth= 6'-0"

Evidence of Groundwater: Not Reached

Depth to Bedrock: Not Reached

Profile Pit 2 — Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	2.5Y 4/6 (Moist)
4								
6								

Total Depth= 6'-0"

Evidence of Groundwater: Not Reached

Depth to Bedrock: Not Reached

Test Pit 3 — Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2	■	Sandy Clay	Massive	Structure less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	10YR 4/6 (Moist)
4	■	Sandy Loam	Granular	Strong	No	Type 2 (LTAR = 0.60) Treatment Level 1	<35%	10YR 5/4 (Moist)
6								
8								

Total Depth= 7'-0"

Evidence of Groundwater: Not Reached

Depth to Bedrock: Not Reached

Test Pit 4 — Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2	■	Sandy Clay Loam	Granular	Strong	No	Type 3 (LTAR = 0.35) Treatment Level 1	<35%	5YR 4/6 (Moist)
4	■	Sandy Clay	Granular	Strong	No	Type 3 (LTAR = 0.35)	<35%	10YR 6/4 (Moist)
6	■	Sandy Loam	Granular	Strong	No	Type 2 (LTAR = 0.60) Treatment Level 1	<35%	2.5Y 6/3 (Moist)
8								

Total Depth= 8'-0"

Evidence of Groundwater: Not Reached

Depth to Bedrock: Not Reached

Test Pit 5 — Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	10YR 5/4 (Moist)
4	■							
6	■	Sandy Clay Loam	Granular	Strong	No	Type 3 (LTAR = 0.35) Treatment Level 1	<35%	10YR 6/2 (Moist)
8								

Total Depth= 8'-6"

Evidence of Groundwater: Not Reached

Depth to Bedrock: Not Reached

TABLE 2
PROFILE PITS FOR OWTS LOT 3

Site 2, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	10YR 5/3 (Moist)
4		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatmemt Level 1**	<35%	2.5Y 6/2 (Moist)
6		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	2.5Y 6/1 (Moist)
8		**Total Depth= 7'-6"**						

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

Site 2, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = .60)**	<35%	10 YR 5/3 (Moist)
4		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	2.5Y 6/2 (Moist)
6		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = .60) Treatment Level 1**	<35%	2.5Y 6/1 (Moist)
8		**Total Depth= 7'-6"**						

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

ATTACHMENT 1

SOILS

NCRS

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 8, 2018—May 26, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
25	Elbeth sandy loam, 3 to 8 percent slopes	14.4	96.4%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	0.5	3.6%
Totals for Area of Interest		**15.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

25—Elbeth sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 367x
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Elbeth and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elbeth

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 3 inches: sandy loam
E - 3 to 23 inches: loamy sand
Bt - 23 to 68 inches: sandy clay loam
C - 68 to 74 inches: sandy clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

92—Tomah-Crowfoot loamy sands, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b9
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Tomah and similar soils: 50 percent
Crowfoot and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tomah

Setting

Landform: Alluvial fans, hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose and/or residuum weathered from arkose

Typical profile

A - 0 to 10 inches: loamy sand
E - 10 to 22 inches: coarse sand
C - 48 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Description of Crowfoot

Setting

Landform: Alluvial fans, hills

Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 12 inches: loamy sand
E - 12 to 23 inches: sand
Bt - 23 to 36 inches: sandy clay loam
C - 36 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

ATTACHMENT 2

LOTS 2 and 3

PROFILE PIT EVALUATION

PARR ENGINEERING & CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

PROFILE PIT EVALUATION

Date: June 12, 2019 **Job:** JN: 19.203A

Site Location: Site 1, 17110 East Goshawk Road
Colorado Springs, CO 80908

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: The materials in the various strata of the soil profile pit were visually classified in accordance with the U.S. Department of Agriculture (USDA) standards.

COLORADO LICENSED PROFESSIONAL ENGINEER DANIEL J. MIZICKO 32484 06-12-19

Profile Pit	Yes
Perc Test	-

Date: (Profile Eval) May 29, 2019
Excavator Parr Engineering
Evaluator R.Jaquet

Depth to Groundwater (permanent or seasonal) Pit #1: Not Reached
Depth to Groundwater (permanent or seasonal) Pit #2: Not Reached

Depth to Bedrock - Pit #1: Not Reached
Depth to Bedrock - Pit #2: Not Reached

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Daniel J. Mizicko P.E.

Profile Pit 1	
Latitude:	**39° 4'46.21"N**
Longitude:	**104°37'53.71"W**
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 6'-0"	Type 4A (LTAR=0.15)
-	-
-	-

Profile Pit 2	
Latitude:	**39° 4'46.13"N**
Longitude:	**104°37'53.13"W**
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 6'-0"	Type 4A (LTAR=0.15)
-	-
-	-

			Location	
			Latitude:	**Longitude:**
Perc #1	N/A	Min./In.	-	-
Perc #2	N/A	Min./In.	-	-
Perc #3	N/A	Min./In.	-	-
	Average: N/A	Min./In.		

Recommendations: (1) An Engineered On-Site Wastewater Treatment system (OWTS) is required for this location due to: (a) Soil Type 4A identified in the treatment zone of Profile Pit #1 & Profile Pit #2.

PARR ENGINEERING
& CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

Google Site Map

Parr Engineering & Consulting, Inc.
11590 Black Forest Road, Suite 10
Colorado Springs, Colorado 80908
Phone: 719-494-0404

Profile Pit - Log

Job Number:	19.203A
Date Evaluated:	05/29/19
Profile Pit#:	Pit #1

Excavator:	Parr Engineering	Total Depth:	6'-0"
Logged By:	R.Jaquet	STA Slope & Direction:	N @ 5%
Method:	Profile Pit	Latitude:	39° 4'46.21"N
Equipment:	Mini Excavator	Longitude:	104°37'53.71"W

Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure-less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	2.5Y 4/6 (Moist)
4								
6								
		Total Depth= 6'-0"						
8								
10								

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

Parr Engineering & Consulting, Inc.
11590 Black Forest Road, Suite 10
Colorado Springs, Colorado 80908
Phone: 719-494-0404

Profile Pit - Log

Job Number:	19.203A
Date Evaluated:	05/29/19
Profile Pit#:	Pit #2

Excavator:	Parr Engineering	Total Depth:	6'-0"
Logged By:	R.Jaquet	STA Slope & Direction:	N @ 5%
Method:	Profile Pit	Latitude:	39° 4'46.13"N
Equipment:	Mini Excavator	Longitude:	104°37'53.13"W

Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure-less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	2.5Y 4/6 (Moist)
4								
6								
		Total Depth= 6'-0"						
8								
10								

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

PARR ENGINEERING
& CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

PROFILE PIT EVALUATION REPORT - General Notes, Regulations & Limitations

General Notes:

This report presents the data obtained pertaining to a Profile Pit Evaluation conducted at the locations indicated on the included Site Map. The purpose of this investigation was to evaluate subsurface soil-profile(s) in the area of the proposed Soil Treatment Area (STA) and to establish design criteria for an On-Site Wastewater Treatment system (OWTS).

Board of Health Regulations & Regulation No. 43 - Engineered Systems:

At proposed soil treatment area locations where any of the following conditions are present, the system shall be designed by a professional engineer and approved by the Health Department:

1. For soil types 3A, 4, 4A, 5, R-0, R-1 and R-2, and Treatment Levels TL2, TL2N, TL3, and TL3N as specified in Tables 10-1 and 10-1A of this regulation;

2.The maximum seasonal ground water surface is less that four feet below the bottom of the proposed absorption system.

3. A restrictive layer exists less that four feet below the bottom of the proposed absorption system

4. The ground slope is in excess of thirty percent

5. Pressure distribution is used.

Limitations:

The data presented in this report is specific to the locations of the Profile Pit locations evaluated. It must be understood and accepted that subsurface conditions can, and often do vary across any given area. These variations may not become evident until the time of system installation. If the subsurface conditions are discovered to vary anywhere across the system footprint, Parr Engineering AND the Design Engineer must be notified immediately for further evaluation. If another individual or party relies on this report, they shall indemnify and hold Parr Engineering & Consulting, Inc. harmless for any damages, losses, or expenses that may incur as a result of its use, except as allowed by law.

PARR ENGINEERING & CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

PROFILE PIT EVALUATION

Date: August 2, 2019 **Job:** JN: 19.203A

Site Location: Site 1, 17110 East Goshawk Road
Colorado Springs, CO 80908

COLORADO LICENSED
DANIEL J. MIZICKO
52484
08/02/19
PROFESSIONAL ENGINEER

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: The materials in the various strata of the soil profile pit were visually classified in accordance with the U.S. Department of Agriculture (USDA) standards.

Profile Pit	Yes
Perc Test	-

Date: (Profile Eval) July 30, 2019
Excavator Parr Engineering
Evaluator R.Jaquet

Depth to Groundwater (permanent or seasonal) Pit #1:	Previous Report
Depth to Groundwater (permanent or seasonal) Pit #2:	Previous Report
Depth to Groundwater (permanent or seasonal) Pit #3:	Not Reached
Depth to Groundwater (permanent or seasonal) Pit #4:	Not Reached
Depth to Groundwater (permanent or seasonal) Pit #5:	Not Reached

Depth to Bedrock - Pit #1:	Previous Report
Depth to Bedrock - Pit #2:	Previous Report
Depth to Bedrock - Pit #3:	Not Reached
Depth to Bedrock - Pit #4:	Not Reached
Depth to Bedrock - Pit #5:	Not Reached

Profile Pit 3	
Latitude:	**39° 4'47.42"N**
Longitude:	**104°37'50.41"W**
Layer	Soil Type & LTAR
0 - 0'-6"	Topsoil
0'-6" - 3'-0"	Type 4A (LTAR=0.15)
3'-0" - 7'-0"	**Type 2 (LTAR=0.60)**

Profile Pit 4	
Latitude:	**39° 4'48.20"N**
Longitude:	**104°37'50.34"W**
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 3'-0"	**Type 3 (LTAR=0.35)**
3'-0" - 4'-0"	**Type 3 (LTAR=0.35)**
4'-0" - 8'-0"	**Type 2 (LTAR=0.60)**

Profile Pit 5	
Latitude:	**39° 4'47.97"N**
Longitude:	**104°37'50.71"W**
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 4'-0"	Type 4A (LTAR=0.15)
4'-0" - 8'-6"	**Type 3 (LTAR=0.35)**

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Daniel J. Mizicko P.E.

Recommendations: (1) An Engineered On-Site Wastewater Treatment system (OWTS) is required for this location due to: (a) Soil Type 4A identified in the treatment zone of Profile Pit #3 & Profile Pit #5.

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Google Site Map

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Profile Pit - Log

Job Number:	19.203A
Date Evaluated:	07/12/19
Profile Pit#:	Pit #3

Excavator:	Contractor	Total Depth:	7'-0"
Logged By:	R.Jaquet	STA Slope & Direction:	S @ 4%
Method:	Profile Pit	Latitude:	39° 4'47.42"N
Equipment:	Mini Excavator	Longitude:	104°37'50.41"W

Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure-less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	10YR 4/6 (Moist)
4, 6		Sandy Loam	Granular	Strong	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	10YR 5/4 (Moist)
8, 10		**Total Depth= 7'-0"**						

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

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Profile Pit - Log	
Job Number:	19.203A
Date Evaluated:	07/30/19
Profile Pit#:	Pit #4

Excavator:	Contractor	Total Depth:	8'-0"
Logged By:	R.Jaquet	STA Slope & Direction:	Generally Flat
Method:	Profile Pit	Latitude:	39° 4'48.20"N
Equipment:	Mini Excavator	Longitude:	104°37'50.34"W

Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2	■	Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	5YR 4/6 (Moist)
4	■	Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35)**	<35%	10YR 6/4 (Moist)
6	■	Sandy Loam	Granular	Strong	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	2.5Y 6/3 (Moist)
8								
10		**Total Depth= 8'-0"**						

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

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Profile Pit - Log	
Job Number:	19.203A
Date Evaluated:	07/30/19
Profile Pit#:	Pit #5

Excavator:	Contractor	Total Depth:	8'-6"
Logged By:	R.Jaquet	STA Slope & Direction:	S @ 3%
Method:	Profile Pit	Latitude:	39° 4'47.97"N
Equipment:	Mini Excavator	Longitude:	104°37'50.71"W

Site 1, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Clay	Massive	Structure-less	No	Type 4A (LTAR = 0.15) Treatment Level 1	<35%	10YR 5/4 (Moist)
4								
6		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	10YR 6/2 (Moist)
8								
		Total Depth= 8'-6"						
10								

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

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PROFILE PIT EVALUATION REPORT - General Notes, Regulations & Limitations

General Notes:

This report presents the data obtained pertaining to a Profile Pit Evaluation conducted at the locations indicated on the included Site Map. The purpose of this investigation was to evaluate subsurface soil-profile(s) in the area of the proposed Soil Treatment Area (STA) and to establish design criteria for an On-Site Wastewater Treatment system (OWTS).

Board of Health Regulations & Regulation No. 43 - Engineered Systems:

At proposed soil treatment area locations where any of the following conditions are present, the system shall be designed by a professional engineer and approved by the Health Department:

1. For soil types 3A, 4, 4A, 5, R-0, R-1 and R-2, and Treatment Levels TL2, TL2N, TL3, and TL3N as specified in Tables 10-1 and 10-1A of this regulation;

2.The maximum seasonal ground water surface is less that four feet below the bottom of the proposed absorption system.

3. A restrictive layer exists less that four feet below the bottom of the proposed absorption system

4. The ground slope is in excess of thirty percent

5. Pressure distribution is used.

Limitations:

The data presented in this report is specific to the locations of the Profile Pit locations evaluated. It must be understood and accepted that subsurface conditions can, and often do vary across any given area. These variations may not become evident until the time of system installation. If the subsurface conditions are discovered to vary anywhere across the system footprint, Parr Engineering AND the Design Engineer must be notified immediately for further evaluation. If another individual or party relies on this report, they shall indemnify and hold Parr Engineering & Consulting, Inc. harmless for any damages, losses, or expenses that may incur as a result of its use, except as allowed by law.

ATTACHMENT 3

LOTS 2 and 3

SOIL BORINGS FOR FOUNDATION DESIGN

PARR ENGINEERING & CONSULTING, INC.

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PROFILE PIT EVALUATION

Date: June 12, 2019 **Job:** JN: 19.203B

Site Location: Site 2, 17110 East Goshawk Road
Colorado Springs, CO 80908

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: The materials in the various strata of the soil profile pit were visually classified in accordance with the U.S. Department of Agriculture (USDA) standards.

COLORADO LICENSED DANIEL J. MIZICKO 52484 PROFESSIONAL ENGINEER
06-12-19

Profile Pit	Yes
Perc Test	-

Date: (Profile Eval) May 29, 2019
Excavator S.Dunfee
Evaluator S.Dunfee

Depth to Groundwater (permanent or seasonal) Pit #1: Not Reached
Depth to Groundwater (permanent or seasonal) Pit #2: Not Reached

Depth to Bedrock - Pit #1: Not Reached
Depth to Bedrock - Pit #2: Not Reached

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Daniel J. Mizicko P.E.

Profile Pit 1	
Latitude:	39° 4'43.47"N
Longitude:	104°38'2.82"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 3'-0"	Type 2 (LTAR=0.60)
3'-0" - 5'-0"	Type 3 (LTAR=0.35)
5'-0" - 7'-6"	Type 2 (LTAR=0.60)

Profile Pit 2	
Latitude:	39° 4'42.98"N
Longitude:	104°38'1.64"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 2'-0"	Type 2 (LTAR=0.60)
2'-0" - 5'-0"	Type 3 (LTAR=0.35)
5'-0" - 7'-6"	Type 2 (LTAR=0.60)

			Location	
			Latitude:	Longitude:
Perc #1	N/A	Min./In.	-	-
Perc #2	N/A	Min./In.	-	-
Perc #3	N/A	Min./In.	-	-
	Average: N/A	Min./In.		

Recommendations: **(1) A conventional, non-engineered On-Site Wastewater Treatment system (OWTS) is acceptable for this site.**

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Google Site Map

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Profile Pit - Log	
Job Number:	19.203B
Date Evaluated:	05/29/19
Profile Pit#:	Pit #1

Excavator:	S.Dunfee	Total Depth:	7'-6"
Logged By:	S.Dunfee	STA Slope & Direction:	Generally Flat
Method:	Profile Pit	Latitude:	39° 4'43.47"N
Equipment:	Mini Excavator	Longitude:	104°38'2.82"W

Site 2, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	10YR 5/3 (Moist)
4		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatmemt Level 1**	<35%	2.5Y 6/2 (Moist)
6		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	2.5Y 6/1 (Moist)
8		**Total Depth= 7'-6"**						
10								

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

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Profile Pit - Log

Job Number:	19.203B
Date Evaluated:	05/29/19
Profile Pit#:	Pit #2

Excavator:	S.Dunfee	Total Depth:	7'-6"
Logged By:	S.Dunfee	STA Slope & Direction:	Generally Flat
Method:	Profile Pit	Latitude:	39° 4'42.98"N
Equipment:	Mini Excavator	Longitude:	104°38'1.64"W

Site 2, 17110 East Goshawk Road, 80908

Depth (ft.)	Sample Interval	USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
2		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = .60)**	<35%	10 YR 5/3 (Moist)
4		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	2.5Y 6/2 (Moist)
6		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = .60) Treatment Level 1**	<35%	2.5Y 6/1 (Moist)
8		**Total Depth= 7'-6"**						
10								

Evidence of Groundwater:	**Not Reached**
Depth to Bedrock:	**Not Reached**

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