WASTEWATER DISPOSAL REPORT

for

Terra Ridge North
Minor Subdivision

EPC Parcel #: 5129300002

December 2022

Prepared By:

JDS-HYDRO CONSULTANTS, INC.
A Division of RESPEC Company, LLC

RESPEC

5540 TECH CENTER DRIVE, SUITE 100▪ COLORADO SPRINGS, CO▪80919▪ (719) 227-0072

TERRA RIDGE NORTH
MINOR SUBDIVISION
EPC Parcel # 5129300002

WASTEWATER DISPOSAL REPORT

December 2022

Prepared for:

Shay Miles
10805 Milam Road
Colorado Springs, CO 80908

Prepared by:

JDS-Hydro Consultants, a Division of RESPEC
5540 Tech Center Drive, Suite 100
Colorado Springs, CO 80919

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

The purpose of this report is to address the specific wastewater loads for the proposed commercial property located at Parcel #5129300002 in El Paso County, CO.

EXECUTIVE SUMMARY: **The proposed subdivision has adequate water rights, water quality, area, and soils to support the proposed residential subdivision's water and wastewater needs on a 300-year basis.**

2.0 PROJECTED LAND USES

2.1 Projected Land Uses

This report pertains to the existing 39.72-acre parcel that is proposed to be divided into eleven (11) lots. Please refer to the *Land Use Exhibit* in ***Appendix A*** depicting the proposed subdivision. The adjacent two (2) existing lots to the south have and will continue to operate under Court Case 96CW68, which was approved on March 6, 1997. These two lots, encompassing 12.86 acres and are represented as Lots 5A and 6A in the replat included in **Appendix** A, but are not included in the proposed 11 lot Terra Nova subdivision. These two lots are part of the separate JeniShay Farms development.

3.0 WASTEWATER REPORT

3.1 Wastewater Loads

There are eleven (11) residential units proposed on the subdivided property. There are 0.825 AF/year of projected water demand for each home, of which is 0.26 AF/year is projected for household use. This equates to a total of 0.234 AF/year/SFE or 2.574 AF/year total to be sent to septic for treatment. A breakdown of projected wastewater loads is summarized in Table 3-1. Average daily wastewater loads are expected to be 90% of average daily indoor use.

Table 3-1: Summary of Expected Water Demands & Wastewater Loads

Water - Under Court Case 2022CW3066						Wastewater
# of SFE's	Annual Indoor Use 0.26 (AF/YR/SFE)	Average Daily Indoor Use (GPD)	Irrigation 0.0566 (AF/1,000 SF)	Domestic Watering 0.011 (AF/Horse/Year)	Total Indoor, Watering, & Irrigation (AF)	ADF (@ 90% Indoor Use (GPD)
	Note 1		*Note 2*	*Note 3*		
11	2.860	2,553	5.740	0.484	9.08	2,297

Note 1: ***Per 8.4.7(B)(7)(d) of the EPC Land Development Code***

Note 2: ***Per 8.4.7(B)(7)(d) of the EPC LDC, assuming 9,220 ft^2 of irrigation per lot***

Note 3: ***Assuming four (4) horses per lot at 0.011 AF/year/horse***

3.2 On-Site Wastewater Treatment Systems (OWTS)

3.2 On-Site Wastewater Treatment System

The proposed single-family homes will be served by individual on-site wastewater treatment systems. The site was evaluated for *on-site wastewater treatment systems* (OWTS) by Geoquest, LLC by obtaining profile pits on July 11, 2019. A Soils and Geology Study was prepared by RMG Architects and Engineers dated March 18, 2022. Three (3) test pits were excavated on the site on by Geoquest on July 11, 2019, to determine general suitability for the use of OWTS. These exploratory borings were drilled to a depth of 8-feet.

Laboratory testing was also performed to classify and determine the soils engineering characteristics. Long term acceptance rates (LTAR) associated with the sand observed in the profile pits was expected to range from 0.50 gallons per day per square foot (GPD/sf) for the sandy loam to 0.15 GPD/sf for the sandy clay. Groundwater and indications of seasonally shallow groundwater were not observed in the profile pit excavations.

The Natural Resource Conservation Service (NRCS) has mapped two (2) soil types on the site, consisting of the following soils:

- Type 68 Peyton-Pring coarse sandy loam at 3% to 8% slopes
- Type 92 Tomah-Crowfoot loamy sands at 3% to 8% slopes

Observations of the groundwater ranging from a depth of seven feet in Profile Pit #1, five feet in Profile Pit #2, and five to seven feet in Profile Pit #3 will likely require the on-site wastewater systems to be designed by a Colorado Registered Professional Engineer (PE).

According to RMG's report, the site is suitable for individual on-site wastewater treatment system if all El Paso County Department of Health and Environment are met and are designed by a Colorado PE. As recommended in the report all treatment areas must achieve the following:

- Treatment areas must be 4 feet above groundwater or bedrock as defined in the El Paso County Board of Health, Chapter 8 OWTS Regulations.
- Each lot (after purchase but prior to construction of an OWTS) will require an OWTS Site Evaluation report prepared per *the Regulations of the El Paso County Board of Health, Chapter 8 OWTS Regulations.*
- Comply with all physical setback requirements of Table 7-1 of the El Paso County Department of Health and Environment (EPCHDE).
- Treatment areas are to be located a minimum of 100 feet from any wells (existing and proposed), including those located within adjacent properties. Treatment areas must also be at least 50 feet away from any spring, lake,

water course, irrigation ditch, stream, wetland, and 25 feet away from dry gulches.

- Each lot shall be designed to ensure that a minimum of 2 sites are appropriate for an OWTS with potential OWTS locations identified on RMG's Septic Sustainability Map, Figure 2. OWTS systems should not be located in areas noted as not recommend on the same map.

However, the report noted that soil conditions could be different throughout the subdivision. If after an OWTS site evaluation report is prepared for the new OWTS and the LTAR value is less than 0.35 or notes soil types 3 to 5, an "engineered system" will be required.

The *Subdivision Profile Pit Evaluation, 15630 Fox Creek Lane, El Paso County, Colorado Job# 18-0975* prepared by Geoquest and dated July 11, 2019, is included in ***Appendix B***.

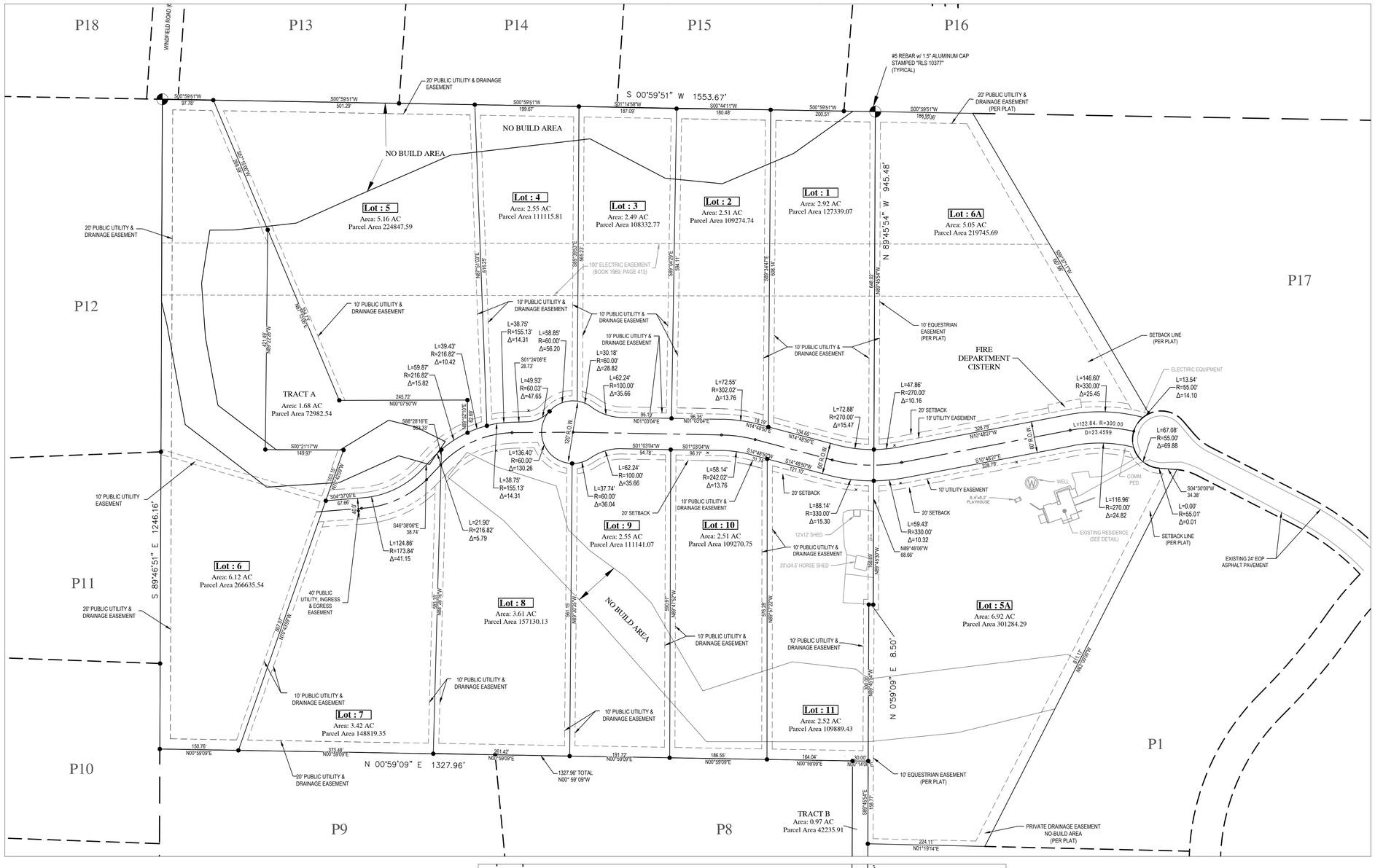
The *Soils and Geology Study, Lots 1-11, Terra Ridge North, Parcel No. 51929-30-002, El Paso County, Colorado,* prepared by RMG dated March 18, 2022 is included in ***Appendix B.***

The *Wastewater Study, Fox Creek Ln, Lots 1-11, Terra Ridge North, El Paso County, Colorado* letter dated March 20, 2022, prepared by RMG is included in ***Appendix B.***

Appendix A

Final Plat
Terra Ridge North

Vacation & Replat of Lots 5 and 6, Terra Ridge Filing No. 1, Together with 11 Proposed Lots in Terra Ridge North
A Portion of Section 29, Township 11 South, Range 65 West of the 6th P.M., El Paso County, Colorado



As Replatted

ADJACENT PROPERTY DESCRIPTION	
P1	Not a part of this subdivision Robb Peters 51293--02-004 Lot 4, Terra Ridge Fil. No 1 Zoned RR-5
P2	Not a part of this subdivision Mark Davis 51293--02-003 Lot 3, Terra Ridge Fil. No 1 Zoned RR-5
P3	Not a part of this subdivision Justin Sumpter 51293--02-002 Lot 2, Terra Ridge Fil. No 1 Zoned RR-5
P4	Not a part of this subdivision Eric Mikuska 51293--02-001 Lot 1, Terra Ridge Fil. No 1 Zoned RR-5
P5	Not a part of this subdivision Diana Gard 51293--01-008 Lot 8, Whispering Hills Estates Zoned RR-5
P6	Not a part of this subdivision Rhonda Barr 51293--01-007 Lot 7, Whispering Hills Estates Zoned RR-5
P7	Not a part of this subdivision Christopher Humlicek 51293--01-006 Lot 6, Whispering Hills Estates Zoned RR-5
P8	Not a part of this subdivision David Khaliqi 51293--01-005 Lot 5, Whispering Hills Ests Zoned RR-5
P9	Not a part of this subdivision Todd Andrews 51293--01-004 Lot 4, Whispering Hills Ests Zoned RR-5
P10	Not a part of this subdivision Richard Martinez 51290--04-013 Lot 8, Ridgeview Acres Zoned RR-5
P11	Not a part of this subdivision Temmer Family Trust 51290--04-012 Lot 7, Ridgeview Acres Zoned RR-5
P12	Not a part of this subdivision Kimberly Tebrugge 51290--04-011 Lot 6, Ridgeview Acres Zoned RR-5
P13	Not a part of this subdivision Roy & Julie Heare 51290--05-002 Lot 148, Wildwood Village Unit 3 Zoned RR-5
P14	Not a part of this subdivision Joshua Trusievitz 51290--05-001 Lot 149, Wildwood Village Unit 3 Zoned RR-5
P15	Not a part of this subdivision Paul Gavin 51290--05-001 Lot 149, Wildwood Village Unit 3 Zoned RR-5
P16	Not a part of this subdivision Abraham Thompson 51290--05-004 Lot 151, Wildwood Village Unit 4 Zoned RR-5
P17	Not a part of this subdivision Hugo Oregel 51293--02-007 Lot 1, Terra Ridge Fil No. 2 Zoned RR-5
P18	Not a part of this subdivision Ricardo Torres 51290--04-001 Lot 147, Wildwood Village Unit No 3 Zoned RR-5

0 100 200 Feet

NOTES:

All points found indicated by -- ◔ -- are as shown on plat.

All points set indicated by -- △ -- are rebar with attached Surveyor's cap mkd "PLS 23890" unless otherwise shown on plat.

●

All measured, used or pro-rated information indicated by S0°12'10"E-518.51'.

All record information indicated by (S0°12'10"E-518.90').

All bearings are relative to the east line of JeniShay Farms as monumented and shown, and was asumed S00°12'10"E.

All reasearch for recorded easements or rights-of-way was done by EmpireTitle of Colorado Springs, LLC., File No. 54837ECS, dated: May 29, 2018.

Appendix B

Job No. 169372

March 30, 2022

Shay Miles
15630 Fox Creek Lane
Colorado Springs, CO 80908

Re: Wastewater Study
Fox Creek Ln
Lots 1-11, Terra Ridge North
El Paso County, Colorado

Ref: *Subdivision Profile Pit Evaluation, 15630 Fox Creek Lane, El Paso County, Colorado,* prepared by Geoquest, LLC, Job#18-0975, dated July 11, 2019.

Dear Mr.Miles:

As requested, personnel of RMG – Rocky Mountain Group has performed a preliminary investigation and site reconnaissance at the above referenced address. It is our understanding the parcel included in this study is:

- EPC Schedule No. 51929-30-002: currently not addressed but labeled as Black Forest Road, which consists of 39.72 acres and is zoned RR-5, Residential Rural

It is our understanding the 39.72-acre parcel is to be subdivided into eleven new lots, ranging between 2.5 and approximately 5.0 acres each.

This letter is to provide information for the on-site wastewater report per the On-Site Wastewater Treatment Systems (OWTS) Regulations of the El Paso County Board of Health pursuant to Chapter 8.

The following are also excluded from the scope of this report including (but not limited to) foundation recommendations, site grading/surface drainage recommendations, subsurface drainage recommendations, geologic, natural and environmental hazards such as landslides, unstable slopes, seismicity, snow avalanches, water flooding, corrosive soils, erosion, radon, wild fire protection, hazardous waste and natural resources.

Previous Studies and Field Investigation

Reports of previous geotechnical engineering/geologic investigations for this site were available for our review and are listed below:

1. Soils and Geology Study, Lots 1-11, Terra Ridge North, Parcel No. 51929-30-002, El Paso County, Colorado, prepared by RMG –Rocky Mountain Group, Job No. 169372, last dated March 18, 2022.
2. *Subdivision Profile Pit Evaluation, 15630 Fox Creek Lane, El Paso County, Colorado,* prepared by Geoquest, LLC., Job#18-0975, dated July 11, 2019.

The findings, conclusions, and recommendations contained in these reports were considered during the preparation of this report.

SITE CONDITIONS

Personnel of RMG performed a reconnaissance visit on July 18, 2019. The purpose of the reconnaissance visit was to evaluate the site surface characteristics including landscape position, topography, vegetation, natural and cultural features, and current and historic land uses. Three 8-foot deep test pits were performed by Geoquest, LLC prior to our reconnaissance visit.

The site surface characteristics were observed to consist of low-lying grasses and weeds across the entire site. Few deciduous trees are scattered across the property.

The following conditions were observed with regard to the 39.72-acre parcel:

- A well currently does not exist on the existing 39.72-acre site;
- No runoff or irrigation features anticipated to cause deleterious effects to treatment systems on the site were observed;
- A major waterway, East Cherry Creek exists on the eastern portion of property. A minor tributary of East Cherry Creek exists on the western portion of the property;
- The entire site lies outside the designated floodway or floodplain;
- Isolated slopes greater than 20 percent exist along the creek banks, but not within the buildable portions of the site; and
- Significant man-made cuts do not exist on the site.

Treatment Areas

Treatment areas at a minimum must achieve the following:

- The treatment areas must be 4 feet above groundwater or bedrock as defined by the Definitions 8.3.4 of the Regulations of the El Paso County Board of Health, Chapter 8, *OWTS Regulations*, effective July 7, 2018;
- Prior to construction of an OWTS, an OWTS design prepared per *the Regulations of the El Paso County Board of Health, Chapter 8, OWTS Regulations* will need to be completed. A scaled site plan and engineered design will also be required prior to obtaining a building permit;

- Comply with any physical setback requirements of Table 7-1 of the El Paso County Department of Health and Environment (EPCDHE);
- Treatment areas are to be located a minimum 100 feet from any well (existing or proposed), including those located on adjacent properties per Table 7-2 per the EPCDHE;
- Treatment areas must also be located a minimum 50 feet from any spring, lake, water course, irrigation ditch, stream or wetland, and 25 feet from dry gulches;
- Other setbacks include the treatment area to be located a minimum 10 feet from property lines, dry gulches, cut banks and fill areas (from the crest); and
- The new lots shall be laid out to ensure that the proposed OWTS does not fall within any restricted areas, (e.g. utility easements, right of ways, water ways). Based on the test pit observations, the parcel has a minimum of two locations for each OWTS.

Contamination of surface and subsurface water resources should not occur if the treatment areas are evaluated and installed according to El Paso County Health Department and State Guidelines in conjunction with proper maintenance.

DOCUMENT REVIEW

RMG has reviewed the above referenced documents and reviewed documented Natural Resource Conservation Service - NRCS data provided by websoilsurvey.nrcs.usda.gov. The Soil Survey Descriptions are presented below. A review of FEMA Map No. 08041C0315G, effective December 7, 2018 indicates that the proposed treatment areas are not located within an identified floodplain.

SOIL EVALUATION

Three profile pits were reportedly performed by Geoquest, LLC to explore the subsurface soils underlying the proposed On-site Wastewater Treatment Systems. The number of test pits is in accordance with Regulations of the El Paso County Board of Health, Chapter 8, On-site Wastewater Treatment Systems (OWTS) as required by 8.5.D.3.a.

The three-profile pit locations were determined by Shay Miles according to the Geoquest, LLC Subdivision Profile Pit Evaluation (referenced above). The Profile Pits were excavated to approximately 8 feet and the approximate locations of the test pits are presented in the Test Pit Location Plan, Figure 1.

OWTS Visual and Tactile Evaluation

A visual and tactile evaluation performed by Geoquest, LLC, and the reported results of their evaluation were considered in the preparation of this report. Bedrock or restrictive layers were not reported in the profile pits. Evidence of seasonal high groundwater was observed in Profile Pit-2 and Profile Pit-3 at depths ranging between 5 to 7 feet. Groundwater was encountered in Profile Pit-1 at approximately 7 feet. The soil descriptions of the profile pit evaluations are presented in Appendix A. A Septic Suitability Map is presented in Figure 2.

The soil conditions as indicated by the NRCS data are anticipated to consist of:

- 68 – Peyton-Pring complex, 3 to 8 percent slopes. Properties of the complex include, well drained soils, depth of the water table is anticipated to be greater than 6.5 feet, run-off is anticipated to be low, frequency of flooding and/or ponding is none, and landforms include hills.

- 92 – Tomah-Crowfoot loamy sands, 3 to 8 percent slopes. Properties of the loamy sands include, well drained soils, depth Qtof the water table is anticipated to be greater than 6.5 feet, run-off is anticipated to be medium, frequency of flooding and/or ponding is none, and landforms include alluvial fans and hills.

A USDA Soil Survey Map and USDA Full Map Unit Descriptions are attached in Figure 3.

Groundwater and seasonal variations of groundwater were observed in the profile pit excavations by Geoquest, LLC. Groundwater was reported in Profile Pit #1 at a depth of 86 inches, Profile Pit #2 at a depth of 60 inches, and Profile Pit #3 at a depth of 80 inches at the time of inspection. Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels. The *Profile Pit Evaluation* by Geoquest is presented in Appendix A.

Redoximorphic features indicating the fluctuation of groundwater or higher ground water levels were reportedly observed in the profile pits by Geoquest, LLC.

An OWTS is proposed for each lot and should conform to the recommendations in a site-specific OWTS site evaluation report. It is anticipated a new evaluation (and OWTS design) will be required for each lot. The profile pits should be located in the vicinity of the proposed treatment fields. Depending on the type of treatment system utilized, a minimum separation of 2 to 4 feet shall be maintained from groundwater and bedrock to the infiltrative surface.

CONCLUSIONS

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems within the cited limitations. There are no foreseeable or stated construction related issues or land use changes proposed at this time. The new proposed lots are suitable for an individual OWTS.

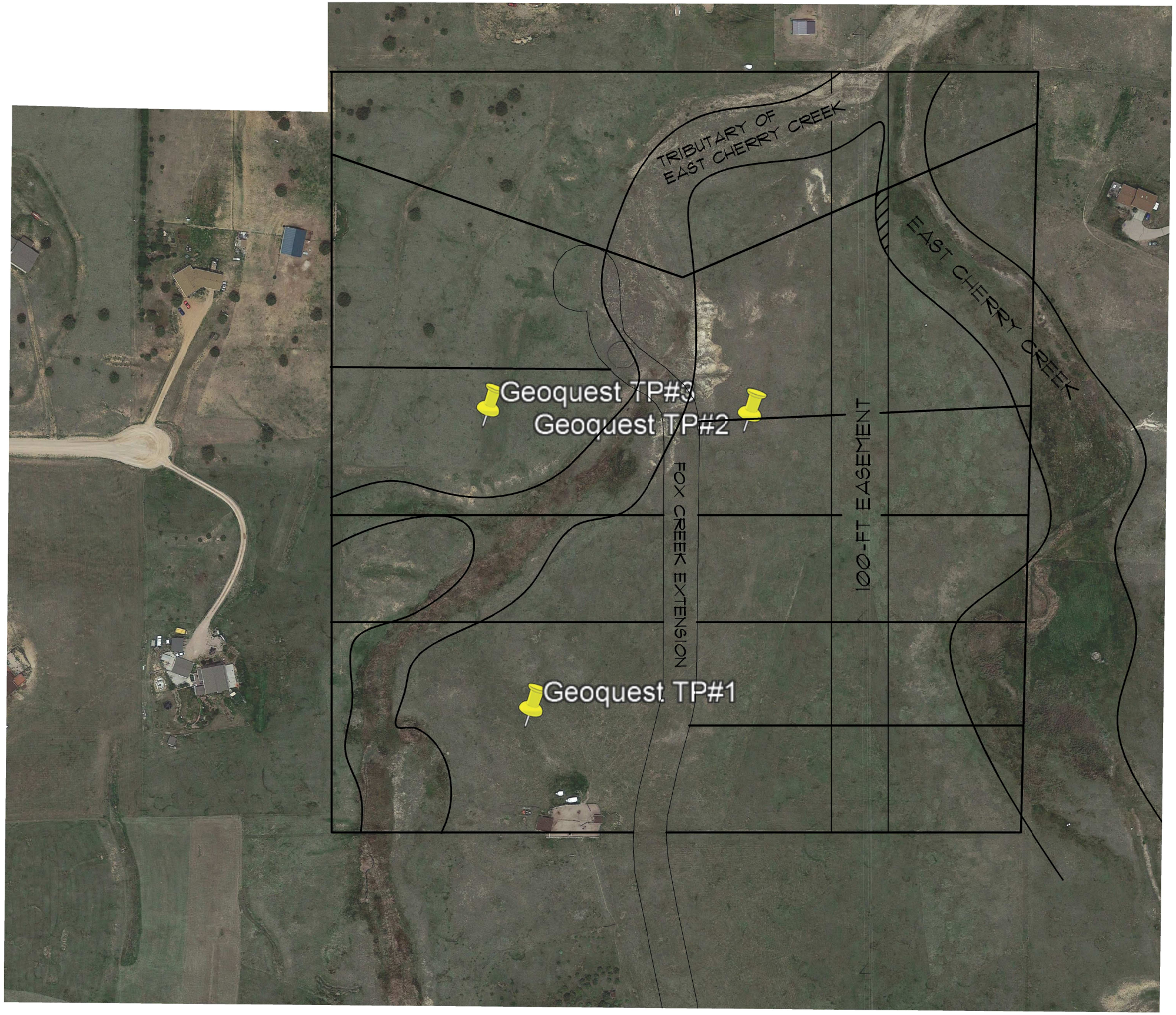
LIMITATIONS

The information provided in this report is based upon the subsurface conditions observed in the profile pit excavations and accepted engineering procedures. The subsurface conditions encountered in the excavation for the treatment area may vary from those encountered in the test pit excavations. Therefore, depth to limiting or restrictive conditions, bedrock, and groundwater may be different from the results reported in this letter.

An OWTS site evaluation will need to be performed in accordance with the applicable health department codes prior to construction.

I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,	Reviewed by,
RMG – Rocky Mountain Group	RMG – Rocky Mountain Group
Kelli Zigler	
Kelli Zigler Project Geologist	Tony Munger, P.E. Geotechnical Project Manager



GRAPHICAL REPRESENTATION ONLY
(ALL LOCATIONS ARE APPROXIMATE AND
TO BE DETERMINED AT THE TIME OF THE SITE
SPECIFIC OWTS EVALUATION)

Geoq DENOTES APPROXIMATE LOCATION OF PROFILE PITS BASED ON GPS COORDINATES GIVEN IN GEOQUEST, LLC SUBDIVISION PROFILE PIT EVALUATION, JOB #18-0975 DATED JULY 11, 2019

NOT TO SCALE
BASE MAP PROVIDED BY: GOOGLE

JOB No. 169372

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Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo / Canon City:
(719) 544-7750

LOTS 1-11
TERRA RIDGE NORTH
PARCEL NO. 51929-30-002

EL PASO COUNTY, COLORADO
SHAY MILES

ENGINEER:	TPM
DRAWN BY:	KMZ
CHECKED BY:	TPM
ISSUED:	8-30-2019
REVISION: UPDATE SITE PLAN	3-18-2022
REVISION: UPDATE SUBDIVISION NAME	3-30-2022

TEST PIT LOCATION PLAN

SHEET No.
FIG-1

DENOTES POSSIBLE LOCATION OF HOUSE

DENOTES POSSIBLE LOCATION(S) OF OWTS

DENOTES AREAS WHERE OWTS ARE NOT RECOMMENDED

NOT TO SCALE

BASE MAP PROVIDED BY: GOOGLE

GRAPHICAL REPRESENTATION ONLY
(ALL LOCATIONS ARE APPROXIMATE AND TO BE DETERMINED AT THE TIME OF THE SITE SPECIFIC OWTS EVALUATION)

DENOTES APPROXIMATE LOCATION OF PROFILE PITS BASED ON GPS COORDINATES GIVEN IN GEOQUEST, LLC SUBDIVISION PROFILE PIT EVALUATION, JOB #18-0975 DATED JULY 11, 2019

JOB No. 169372

ARCHITECTS RMG ENGINEERS
ROCKY MOUNTAIN GROUP

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LOTS 1-11
TERRA RIDGE NORTH
PARCEL NO. 51929-30-002

EL PASO COUNTY, COLORADO
SHAY MILES

ENGINEER: TPM
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CHECKED BY: TPM
ISSUED: 8-30-2019
REVISION: UPDATE SITE PLAN 3-18-22
REVISION: UPDATE SUBDIVISION NAME 3-30-2022

SEPTIC SUITABILITY MAP

SHEET No.
FIG-2

El Paso County Area, Colorado

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: Hills, alluvial fans
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
Bt - 22 to 48 inches: stratified coarse sand to sandy clay loam
C - 48 to 60 inches: coarse sand

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.80 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
Hydric soil rating: No

USDA Natural Resources Conservation Service | Web Soil Survey National Cooperative Soil Survey | 8/27/2019 Page 1 of 3

El Paso County Area, Colorado

68—Peyton-Pring complex, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 369f
Elevation: 6,800 to 7,800 feet
Farmland classification: Not prime farmland

Map Unit Composition
Peyton and similar soils: 40 percent
Pring and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting
Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile
A - 0 to 12 inches: sandy loam
Bt - 12 to 25 inches: sandy clay loam
BC - 25 to 35 inches: sandy loam
C - 35 to 80 inches: sandy loam

Properties and qualities
Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
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 supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
Hydric soil rating: No

NOT TO SCALE

BASE MAP PROVIDED BY: USDA

JOB No. 169372

ARCHITECTS RMG ENGINEERS

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LOTS 1-11
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EL PASO COUNTY, COLORADO
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ENGINEER: TPM
DRAWN BY: KMZ
CHECKED BY: TPM
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REVISION: UPDATE SITE PLAN 3-18-2022
REVISION: UPDATE SUBDIVISION NAME 3-30-2022

USDA SOIL SURVEY MAP AND DESCRIPTIONS

SHEET No.
FIG-3

APPENDIX A

Subdivision Profile Pit Evaluation, 15630 Fox Creek Lane, El Paso County, Colorado,
prepared by Geoquest, LLC, Job#18-0975, dated July 11, 2019.

GEOQUEST, LLC
6825 Silver Ponds Heights #101
Colorado Springs, CO 80908
(719) 481-4560

SUBDIVISION PROFILE PIT EVALUATION

FOR

SHAY MILES

JOB #18-0975

15630 Fox Creek Lane,
El Paso County,
Colorado

Sincerely,

Charles E. Milligan, P.E.
Civil Engineer

COLORADO REGISTERED
CHARLES E. MILLIGAN
34608
PROFESSIONAL ENGINEER

PROFILE PIT FINDINGS

Enclosed are the results of the subdivision profile pit report for the septic systems to be installed at **15630 Fox Creek Lane, El Paso County, Colorado. This report is for planning purposes for the development of the subdivision. Two profile pits will be required on each plotted lot prior to issuance of permits.** The location of the test pits was determined by Shay Miles. The residences will not be on a public water system. The number of bedrooms in the design for the residences is unknown. Due to the natural slope of the property, the system near Profile Pit #1 will feed to the northwest at approximately 8%, the system near Profile Pit #2 will feed to the southwest at approximately 6%, and the system near Profile Pit #3 will feed to the southeast at approximately 11%. All applicable portions of the El Paso County Health Department Onsite Wastewater Treatment System Regulations (OWTS) must be complied with for the installation of the treatment system.

The inspection was performed on May 28, 2019, in accordance with Table 10-1 of the **E.P.C.P.H. OWTS Regulations.**

Soil Profile #1:

0 to 6" - Topsoil - loam, organic composition.

6" to 28" - USDA soil texture sandy clay loam, soil type 3A, structure shape granular, structure grade 1, non-cemented, LTAR 0.30, dark brown in color, 7.5 YR 3/2, organics.

28" to 68" - USDA soil texture sandy loam, soil type 2A, structure shape massive, structure grade 0, non-cemented, LTAR 0.50, light yellowish brown in color, 10 YR 6/4, ~ 15% gravel.

68" to 8' - USDA soil texture sandy clay loam, soil type 3A, structure shape massive, structure grade 0, non-cemented, LTAR 0.30, pale brown in color, 10 YR 6/3, zones of clay, high moisture at 78 inches, groundwater at 86 inches.

Soil Profile #2:

0 to 12" - Topsoil - loam, organic composition.

12" to 52" - USDA soil texture loamy sand, soil type 1, structure shape single grain, structure grade 0, non-cemented, LTAR 0.80, strong brown in color, 7.5 YR 4/6, ~ 20% gravel.

52" to 62" - USDA soil texture sandy loam, soil type 2A, structure shape massive, structure grade 0, non-cemented, LTAR 0.50, brown in color, 7.5 YR 5/3, redoximorphic features at 60 inches.

62" to 8' - USDA soil texture loamy sand, soil type 1, structure shape single grain, structure grade 0, non-cemented, LTAR 0.80, yellowish brown in color, 10 YR 5/4, ~ 30% gravel.

Soil Profile #3:

0 to 10" - Topsoil - loam, organic composition.

10" to 40" - USDA soil texture sandy clay, soil type 4A, structure shape massive, structure grade 0, non-cemented, LTAR 0.15, dark yellowish brown in color, 10 YR 4/4.

40" to 84" - USDA soil texture sandy clay, soil type 4A, structure shape blocky, structure grade 1, non-cemented, LTAR 0.15, yellowish brown in color, 10 YR 5/4, redoximorphic features at 80 inches.

84" to 8' - USDA soil texture sandy clay, soil type 4A, structure shape massive, structure grade 0, non-cemented, LTAR 0.15, yellowish brown in color, 10 YR 5/4.

Groundwater was encountered at the depth of 86 inches in Profile Pit #1 during the inspection. Groundwater evidence was encountered at the depth of 60 inches in Profile Pit #2 and 80 inches in Profile Pit #3 during the inspection. Bedrock was not encountered during the inspection. No known wells were observed within 100 feet of the proposed systems. **All setbacks shall conform to county regulations.**

Designs by Colorado Registered Professional Engineers are likely required due to encountered soil types and groundwater. Maximum depths are expected to range from 12 inches to 36 inches, though anomalies may occur. Long Term Acceptance Rates (LTAR) are expected to range from 0.50 GPD/SF for sandy loam to 0.15 GPD/SF for sandy clay.

Weather conditions at the time of the test consisted of clear skies with warm temperatures.

A Natural Resources Conservation Service Soil Survey Map is appended to this report.

PROFILE PIT LOG - Profile Pit #1

JOB#: 18-0975
DATE EVALUATED: 28 MAY 2019
EQUIPMENT USED: MINI EXCAVATOR

0"-6" **TOPSOIL**
Loam
Organic Composition

6"- 28" **Clayey Sand**
Fine-very coarse Grained
Moderate Density
Low-moderate Moisture Content
Moderate Clay Content
Moderate Cohesion
Moderate Plasticity
Dark Brown Color
7.5YR 3/2

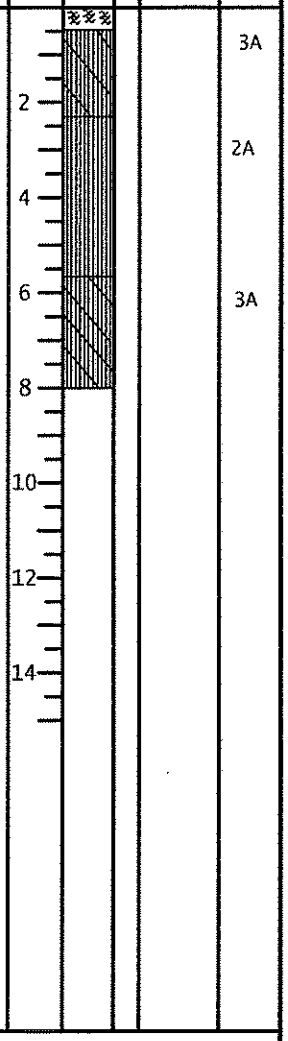
USDA Soil Texture: Sandy Clay Loam
USDA Soil Type: 3A
USDA Structure Shape: Granular
USDA Structure Grade: 1
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.30
Organics

28"- 68" **Sand**
Fine-very coarse Grained
High Density
Low Moisture Content
Low Clay Content
Low Cohesion
Low Plasticity
Light Yellowish Brown Color
10YR 6/4

USDA Soil Texture: Sandy Loam
USDA Soil Type: 2A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.50
~15% gravel

68"- 8' **Clayey Sand**
Fine-very coarse Grained
High Density
Moderate-high Moisture Content
Low-moderate Clay Content
Low-moderate Cohesion
Low-moderate Plasticity
Pale Brown Color
10YR 6/3

USDA Soil Texture: Sandy Clay Loam
USDA Soil Type: 3A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.30
Zones of Clay
High moisture @ 78"
Groundwater @ 86"



LTAR to be Used for OWTS Sizing: **0.30GPD/SF (USDA Type 3A, Treatment soil, Treatment Level 1)**
Depth to Groundwater (Permanent or Seasonal): Permanent @ 86"
Depth to Bedrock and Type: Not Encountered
Depth to Proposed Infiltrative Surface from Ground Surface: Max. 30" Deep
Soil Treatment Area Slope and Direction: Northwest @ 8%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

Project: 18-0975
Sheet: 1 of 3
Date: 3 June 2019
Scale: 1/4" = 1'
Drawn by: rah
Checked by: cem

Project Name and Address
Shay Miles

15630 Fox Creek Lane
Sch. No. 51293000002
El Paso County, Colorado

GEOQUEST, LLC.
6825 SILVER PONDS HEIGHTS
SUITE 101
COLORADO SPRINGS, CO
80908

OFFICE: (719) 481-4560
FAX: (719) 481-9204

PROFILE PIT LOG - Profile Pit #2

JOB#: 18-0975
DATE EVALUATED: 28 MAY 2019
EQUIPMENT USED: MINI EXCAVATOR

0"-12" **TOPSOIL**
Loam
Organic Composition

12"- 52" **Sand**

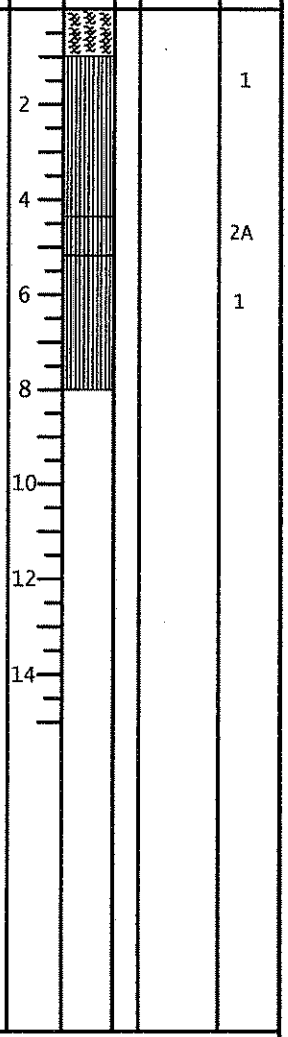
Fine-very coarse Grained	USDA Soil Texture: Loamy Sand
Low Density	USDA Soil Type: 1
Moderate-high Moisture Content	USDA Structure Shape: Single Grain
Low Clay Content	USDA Structure Grade: 0
Low Cohesion	Cementation Class: Non-cemented
Low Plasticity	Long Term Acceptance Rate (LTAR, Treatment Level 1):0.80
Strong Brown Color 7.5YR 4/6	~ 20% gravel

52"- 62" **Sand**

Fine-coarse Grained	USDA Soil Texture: Sandy Loam
Moderate-high Density	USDA Soil Type: 2A
Low Moisture Content	USDA Structure Shape: Massive
Low Clay Content	USDA Structure Grade: 0
Low Cohesion	Cementation Class: Non-cemented
Low Plasticity	Long Term Acceptance Rate (LTAR, Treatment Level 1):0.50
Brown Color 7.5YR 5/3	Redox @ 60"

62"- 8' **Sand**

Fine-very coarse Grained	USDA Soil Texture: Loamy Sand
Low Density	USDA Soil Type: 1
Low Moisture Content	USDA Structure Shape: Single Grain
Low Clay Content	USDA Structure Grade: 0
Low Cohesion	Cementation Class: Non-cemented
Low Plasticity	Long Term Acceptance Rate (LTAR, Treatment Level 1):0.80
Yellowish Brown Color 10YR 5/4	~ 30% gravel



LTAR to be Used for OWTS Sizing: **0.50GPD/SF (USDA Type 2A, Treatment soil, Treatment Level 1)**
Depth to Groundwater (Permanent or Seasonal): Seasonal @ 60"
Depth to Bedrock and Type: Not Encountered
Depth to Proposed Infiltrative Surface from Ground Surface: Max. 12" Deep
Soil Treatment Area Slope and Direction: Southwest @ 6%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

Project: 18-0975	Project Name and Address
Sheet: 2 of 3	Shay Miles
Date: 3 June 2019	
	15630 Fox Creek Lane
	Sch. No. 51293000002
Scale: 1/4" = 1'	El Paso County, Colorado
Drawn by: rah	
Checked by: cem	

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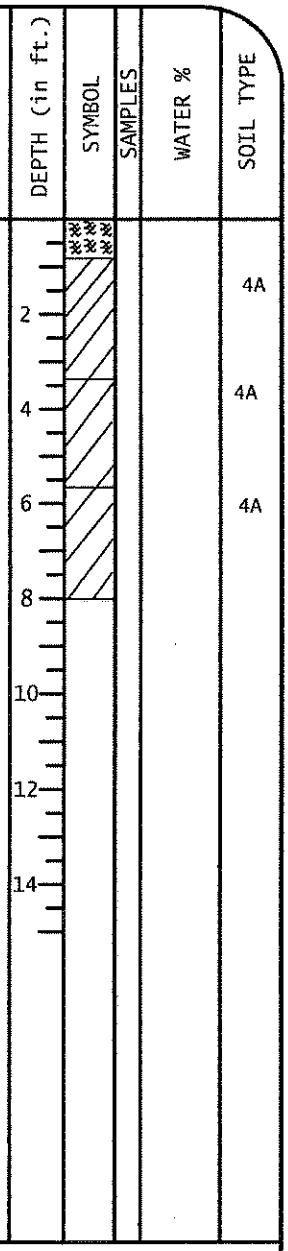
PROFILE PIT LOG - Profile Pit #3

JOB#: 18-0975
DATE EVALUATED: 28 MAY 2019
EQUIPMENT USED: MINI EXCAVATOR



0"-10" **TOPSOIL**
Loam
Organic Composition

10"- 40" **Clay**
Fine-coarse Grained
Moderate Density
Low-moderate Moisture Content
High Clay Content
High Cohesion
High Plasticity
Dark Yellowish Brown Color
10YR 4/4

USDA Soil Texture: Sandy Clay
USDA Soil Type: 4A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.15

40"- 84" **Clay**
Fine-coarse Grained
Very High Density
Low Moisture Content
High Clay Content
High Cohesion
High Plasticity
Yellowish Brown Color
10YR 5/4

USDA Soil Texture: Sandy Clay
USDA Soil Type: 4A
USDA Structure Shape: Blocky
USDA Structure Grade: 1
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.15
Redox @ 80"

84"- 8' **Clay**
Fine coarse Grained
Moderate-high Density
Low-moderate Moisture Content
High Clay Content
High Cohesion
High Plasticity
Yellowish Brown Color
10YR 5/4

USDA Soil Texture: Sandy Clay
USDA Soil Type: 4A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.15

LTAR to be Used for OWTS Sizing: **0.15GPD/SF (USDA Type 4A, Treatment soil, Treatment Level 1)**
Depth to Groundwater (Permanent or Seasonal): Seasonal @ 80"
Depth to Bedrock and Type: Not Encountered
Depth to Proposed Infiltrative Surface from Ground Surface: Max. 32" Deep
Soil Treatment Area Slope and Direction: Southeast @ 11%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

Project: 18-0975
Sheet: 3 of 3
Date: 3 June 2019
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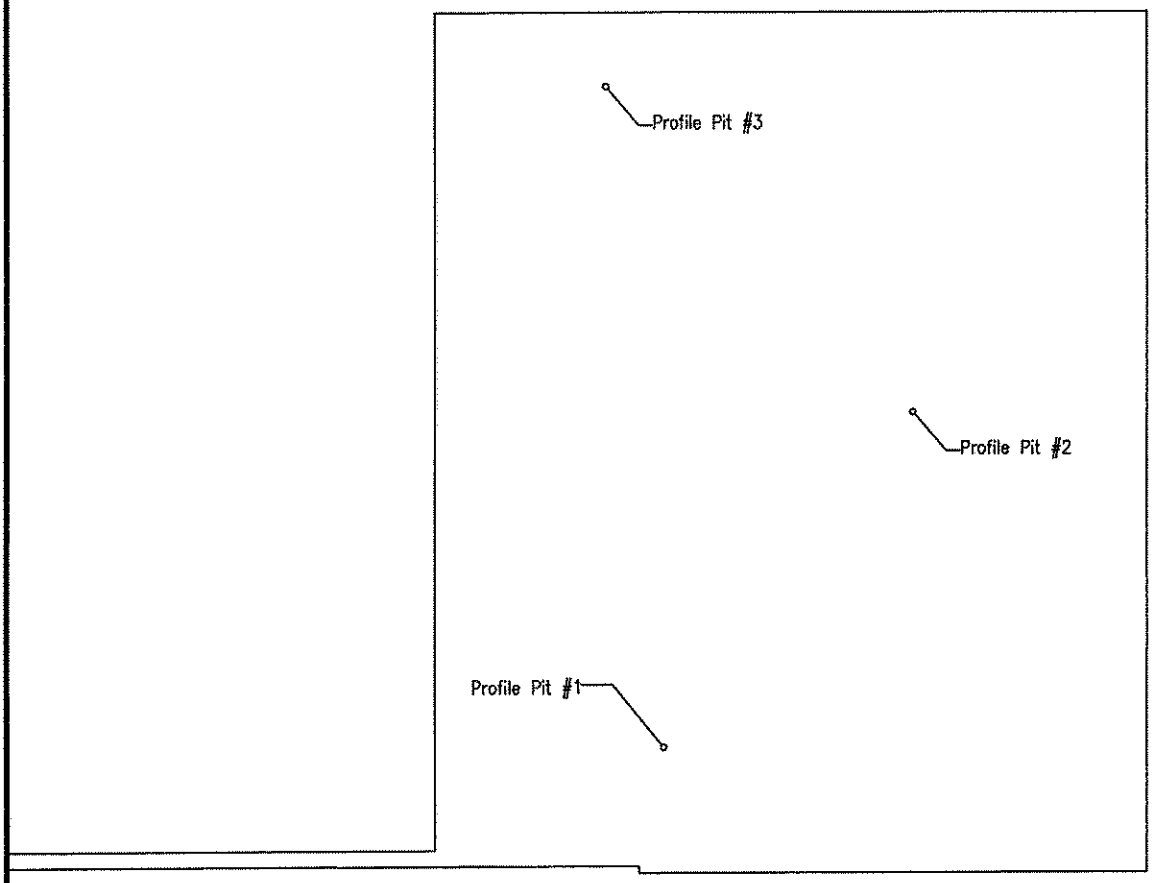
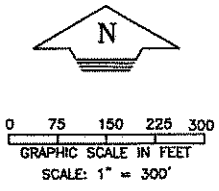
GEOQUEST LLC

SITE MAP

15630 Fox Creek Lane
El Paso County,
Colorado
Job #18-0975



Location from Northwest Lot Corner to Profile Pit #1:
S. 73° E. – 1188'
Location from Profile Pit #1 to Profile Pit #2:
N. 54° E. – 645'
Location from Profile Pit #2 to Profile Pit #3:
N. 47° W. – 690'
GPS Coordinates:
Pit 1; N. 39° 03' 38.47" W. 104° 41' 39.06"
Pit 2; N. 39° 03' 43.84" W. 104° 41' 34.07"
Pit 3; N. 39° 03' 48.88" W. 104° 41' 40.09"



United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for El Paso County Area, Colorado

June 6, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

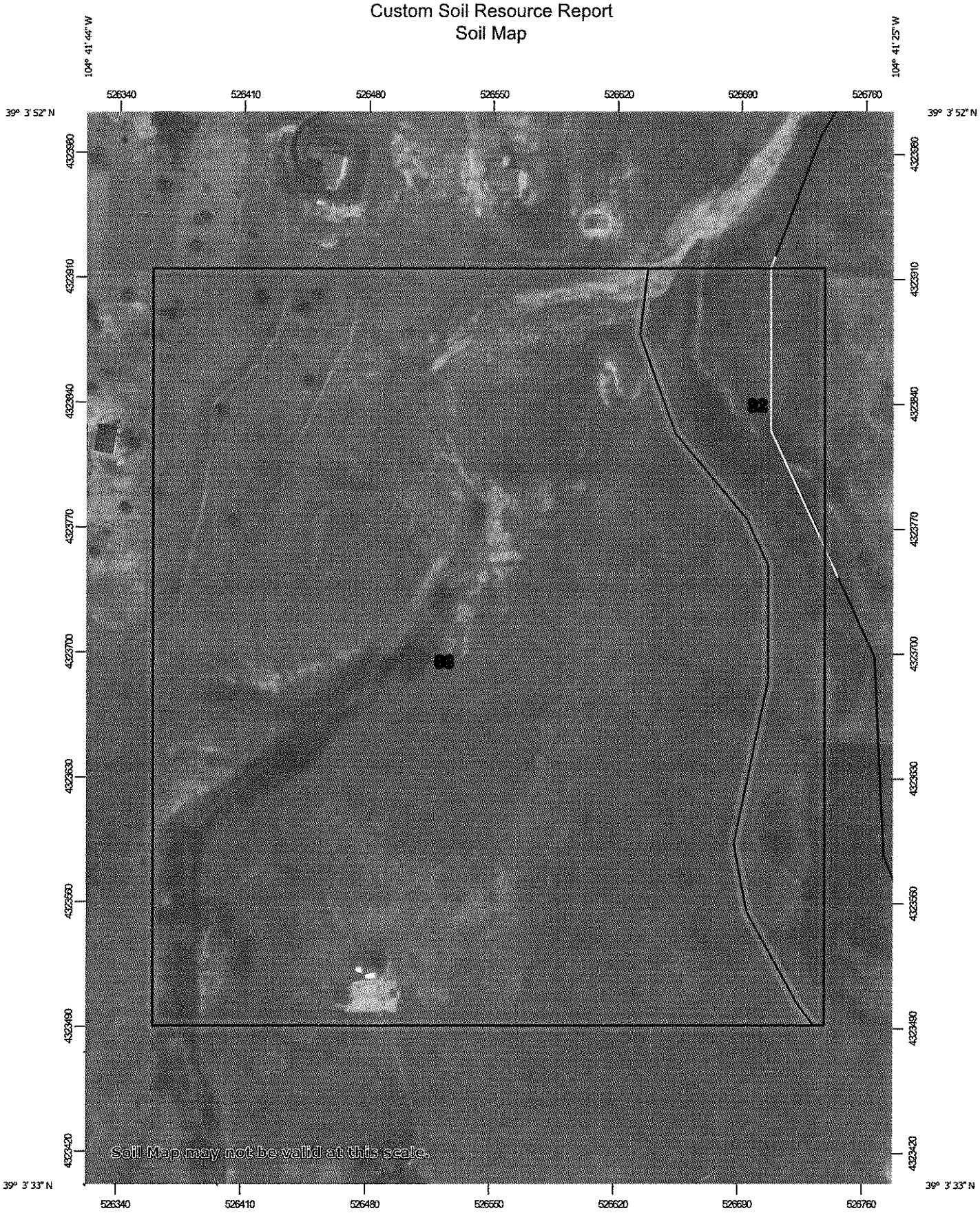
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:2,930 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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: Jun 7, 2016—Aug 17, 2017

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
68	Peyton-Pring complex, 3 to 8 percent slopes	34.3	86.0%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	5.6	14.0%
Totals for Area of Interest		**39.8**	**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

68—Peyton-Pring complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369f
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 40 percent
Pring and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam
Bt - 12 to 25 inches: sandy clay loam
BC - 25 to 35 inches: sandy loam
C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
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 7.3 inches)

Interpretive groups

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

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Park (R048AY222CO)
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

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

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GEOQUEST, LLC
6825 Silver Ponds Heights #101
Colorado Springs, CO 80908
(719) 481-4560

SUBDIVISION PROFILE PIT EVALUATION

FOR

SHAY MILES

JOB #18-0975

15630 Fox Creek Lane,
El Paso County,
Colorado

Sincerely,

Charles E. Milligan, P.E.
Civil Engineer

COLORADO REGISTERED
CHARLES E. MILLIGAN
34608
PROFESSIONAL ENGINEER

PROFILE PIT FINDINGS

Enclosed are the results of the subdivision profile pit report for the septic systems to be installed at **15630 Fox Creek Lane, El Paso County, Colorado. This report is for planning purposes for the development of the subdivision. Two profile pits will be required on each plotted lot prior to issuance of permits.** The location of the test pits was determined by Shay Miles. The residences will not be on a public water system. The number of bedrooms in the design for the residences is unknown. Due to the natural slope of the property, the system near Profile Pit #1 will feed to the northwest at approximately 8%, the system near Profile Pit #2 will feed to the southwest at approximately 6%, and the system near Profile Pit #3 will feed to the southeast at approximately 11%. All applicable portions of the El Paso County Health Department Onsite Wastewater Treatment System Regulations (OWTS) must be complied with for the installation of the treatment system.

The inspection was performed on May 28, 2019, in accordance with Table 10-1 of the **E.P.C.P.H. OWTS Regulations.**

Soil Profile #1:

0 to 6" - Topsoil - loam, organic composition.

6" to 28" - USDA soil texture sandy clay loam, soil type 3A, structure shape granular, structure grade 1, non-cemented, LTAR 0.30, dark brown in color, 7.5 YR 3/2, organics.

28" to 68" - USDA soil texture sandy loam, soil type 2A, structure shape massive, structure grade 0, non-cemented, LTAR 0.50, light yellowish brown in color, 10 YR 6/4, ~ 15% gravel.

68" to 8' - USDA soil texture sandy clay loam, soil type 3A, structure shape massive, structure grade 0, non-cemented, LTAR 0.30, pale brown in color, 10 YR 6/3, zones of clay, high moisture at 78 inches, groundwater at 86 inches.

Soil Profile #2:

0 to 12" - Topsoil - loam, organic composition.

12" to 52" - USDA soil texture loamy sand, soil type 1, structure shape single grain, structure grade 0, non-cemented, LTAR 0.80, strong brown in color, 7.5 YR 4/6, ~ 20% gravel.

52" to 62" - USDA soil texture sandy loam, soil type 2A, structure shape massive, structure grade 0, non-cemented, LTAR 0.50, brown in color, 7.5 YR 5/3, redoximorphic features at 60 inches.

62" to 8' - USDA soil texture loamy sand, soil type 1, structure shape single grain, structure grade 0, non-cemented, LTAR 0.80, yellowish brown in color, 10 YR 5/4, ~ 30% gravel.

Soil Profile #3:

0 to 10" - Topsoil - loam, organic composition.

10" to 40" - USDA soil texture sandy clay, soil type 4A, structure shape massive, structure grade 0, non-cemented, LTAR 0.15, dark yellowish brown in color, 10 YR 4/4.

40" to 84" - USDA soil texture sandy clay, soil type 4A, structure shape blocky, structure grade 1, non-cemented, LTAR 0.15, yellowish brown in color, 10 YR 5/4, redoximorphic features at 80 inches.

84" to 8' - USDA soil texture sandy clay, soil type 4A, structure shape massive, structure grade 0, non-cemented, LTAR 0.15, yellowish brown in color, 10 YR 5/4.

Groundwater was encountered at the depth of 86 inches in Profile Pit #1 during the inspection. Groundwater evidence was encountered at the depth of 60 inches in Profile Pit #2 and 80 inches in Profile Pit #3 during the inspection. Bedrock was not encountered during the inspection. No known wells were observed within 100 feet of the proposed systems. **All setbacks shall conform to county regulations.**

Designs by Colorado Registered Professional Engineers are likely required due to encountered soil types and groundwater. Maximum depths are expected to range from 12 inches to 36 inches, though anomalies may occur. Long Term Acceptance Rates (LTAR) are expected to range from 0.50 GPD/SF for sandy loam to 0.15 GPD/SF for sandy clay.

Weather conditions at the time of the test consisted of clear skies with warm temperatures.

A Natural Resources Conservation Service Soil Survey Map is appended to this report.

PROFILE PIT LOG - Profile Pit #1

JOB#: 18-0975
DATE EVALUATED: 28 MAY 2019
EQUIPMENT USED: MINI EXCAVATOR

0"-6" **TOPSOIL**
Loam
Organic Composition

6"- 28" **Clayey Sand**
Fine-very coarse Grained
Moderate Density
Low-moderate Moisture Content
Moderate Clay Content
Moderate Cohesion
Moderate Plasticity
Dark Brown Color
7.5YR 3/2

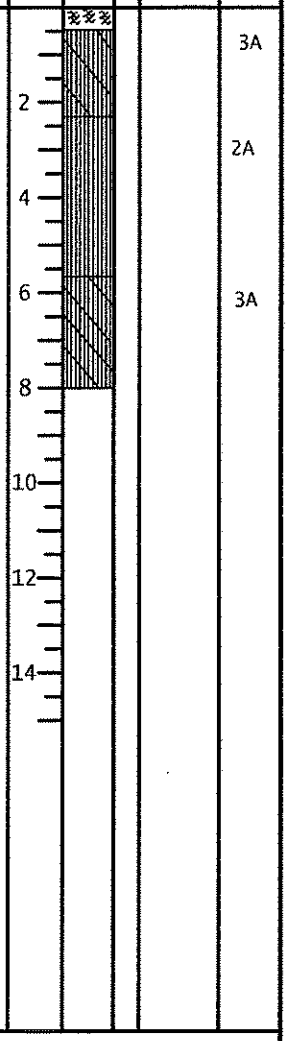
USDA Soil Texture: Sandy Clay Loam
USDA Soil Type: 3A
USDA Structure Shape: Granular
USDA Structure Grade: 1
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.30
Organics

28"- 68" **Sand**
Fine-very coarse Grained
High Density
Low Moisture Content
Low Clay Content
Low Cohesion
Low Plasticity
Light Yellowish Brown Color
10YR 6/4

USDA Soil Texture: Sandy Loam
USDA Soil Type: 2A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.50
~15% gravel

68"- 8' **Clayey Sand**
Fine-very coarse Grained
High Density
Moderate-high Moisture Content
Low-moderate Clay Content
Low-moderate Cohesion
Low-moderate Plasticity
Pale Brown Color
10YR 6/3

USDA Soil Texture: Sandy Clay Loam
USDA Soil Type: 3A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.30
Zones of Clay
High moisture @ 78"
Groundwater @ 86"



LTAR to be Used for OWTS Sizing: **0.30GPD/SF (USDA Type 3A, Treatment soil, Treatment Level 1)**
Depth to Groundwater (Permanent or Seasonal): Permanent @ 86"
Depth to Bedrock and Type: Not Encountered
Depth to Proposed Infiltrative Surface from Ground Surface: Max. 30" Deep
Soil Treatment Area Slope and Direction: Northwest @ 8%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

Project: 18-0975
Sheet: 1 of 3
Date: 3 June 2019
Scale: 1/4" = 1'
Drawn by: rah
Checked by: cem

Project Name and Address
Shay Miles

15630 Fox Creek Lane
Sch. No. 51293000002
El Paso County, Colorado

GEOQUEST, LLC.
6825 SILVER PONDS HEIGHTS
SUITE 101
COLORADO SPRINGS, CO
80908

OFFICE: (719) 481-4560
FAX: (719) 481-9204

PROFILE PIT LOG - Profile Pit #2

JOB#: 18-0975
DATE EVALUATED: 28 MAY 2019
EQUIPMENT USED: MINI EXCAVATOR

0"-12" **TOPSOIL**
Loam
Organic Composition

12"- 52" **Sand**

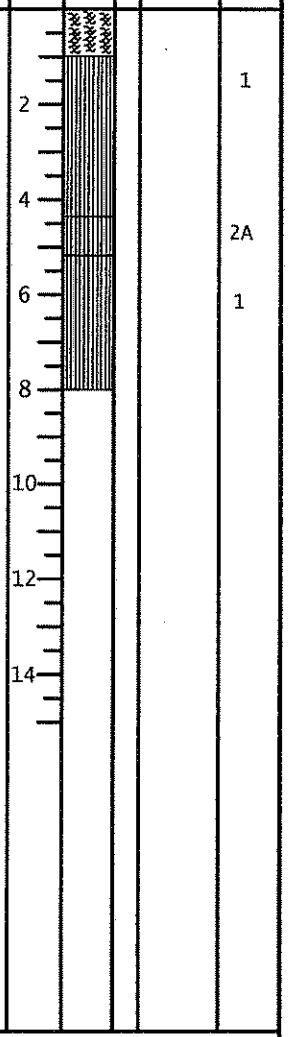
Fine-very coarse Grained	USDA Soil Texture: Loamy Sand
Low Density	USDA Soil Type: 1
Moderate-high Moisture Content	USDA Structure Shape: Single Grain
Low Clay Content	USDA Structure Grade: 0
Low Cohesion	Cementation Class: Non-cemented
Low Plasticity	Long Term Acceptance Rate (LTAR, Treatment Level 1):0.80
Strong Brown Color 7.5YR 4/6	~ 20% gravel

52"- 62" **Sand**

Fine-coarse Grained	USDA Soil Texture: Sandy Loam
Moderate-high Density	USDA Soil Type: 2A
Low Moisture Content	USDA Structure Shape: Massive
Low Clay Content	USDA Structure Grade: 0
Low Cohesion	Cementation Class: Non-cemented
Low Plasticity	Long Term Acceptance Rate (LTAR, Treatment Level 1):0.50
Brown Color 7.5YR 5/3	Redox @ 60"

62"- 8' **Sand**

Fine-very coarse Grained	USDA Soil Texture: Loamy Sand
Low Density	USDA Soil Type: 1
Low Moisture Content	USDA Structure Shape: Single Grain
Low Clay Content	USDA Structure Grade: 0
Low Cohesion	Cementation Class: Non-cemented
Low Plasticity	Long Term Acceptance Rate (LTAR, Treatment Level 1):0.80
Yellowish Brown Color 10YR 5/4	~ 30% gravel



LTAR to be Used for OWTS Sizing: **0.50GPD/SF (USDA Type 2A, Treatment soil, Treatment Level 1)**
Depth to Groundwater (Permanent or Seasonal): Seasonal @ 60"
Depth to Bedrock and Type: Not Encountered
Depth to Proposed Infiltrative Surface from Ground Surface: Max. 12" Deep
Soil Treatment Area Slope and Direction: Southwest @ 6%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

Project: 18-0975	Project Name and Address
Sheet: 2 of 3	Shay Miles
Date: 3 June 2019	
	15630 Fox Creek Lane
	Sch. No. 51293000002
Scale: 1/4" = 1'	El Paso County, Colorado
Drawn by: rah	
Checked by: cem	

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80908

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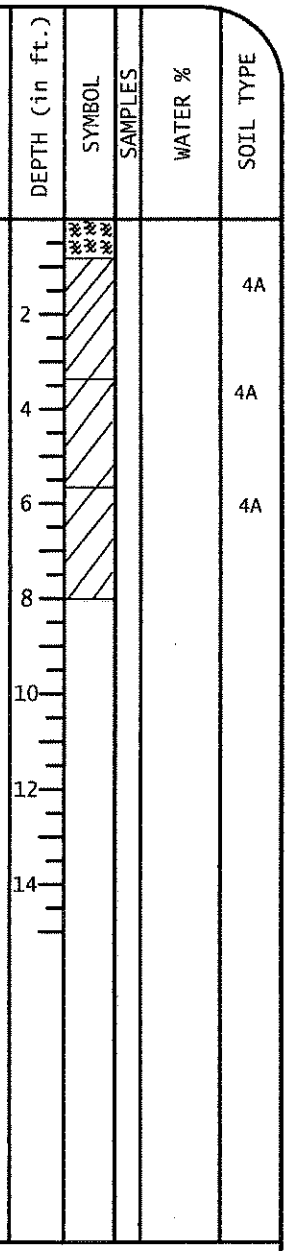
PROFILE PIT LOG - Profile Pit #3

JOB#: 18-0975
DATE EVALUATED: 28 MAY 2019
EQUIPMENT USED: MINI EXCAVATOR



0"-10" **TOPSOIL**
Loam
Organic Composition

10"- 40" **Clay**
Fine-coarse Grained
Moderate Density
Low-moderate Moisture Content
High Clay Content
High Cohesion
High Plasticity
Dark Yellowish Brown Color
10YR 4/4

USDA Soil Texture: Sandy Clay
USDA Soil Type: 4A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.15

40"- 84" **Clay**
Fine-coarse Grained
Very High Density
Low Moisture Content
High Clay Content
High Cohesion
High Plasticity
Yellowish Brown Color
10YR 5/4

USDA Soil Texture: Sandy Clay
USDA Soil Type: 4A
USDA Structure Shape: Blocky
USDA Structure Grade: 1
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.15
Redox @ 80"

84"- 8' **Clay**
Fine coarse Grained
Moderate-high Density
Low-moderate Moisture Content
High Clay Content
High Cohesion
High Plasticity
Yellowish Brown Color
10YR 5/4

USDA Soil Texture: Sandy Clay
USDA Soil Type: 4A
USDA Structure Shape: Massive
USDA Structure Grade: 0
Cementation Class: Non-cemented
Long Term Acceptance Rate (LTAR, Treatment Level 1):0.15

LTAR to be Used for OWTS Sizing: **0.15GPD/SF (USDA Type 4A, Treatment soil, Treatment Level 1)**
Depth to Groundwater (Permanent or Seasonal): Seasonal @ 80"
Depth to Bedrock and Type: Not Encountered
Depth to Proposed Infiltrative Surface from Ground Surface: Max. 32" Deep
Soil Treatment Area Slope and Direction: Southeast @ 11%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

Project: 18-0975
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Project Name and Address
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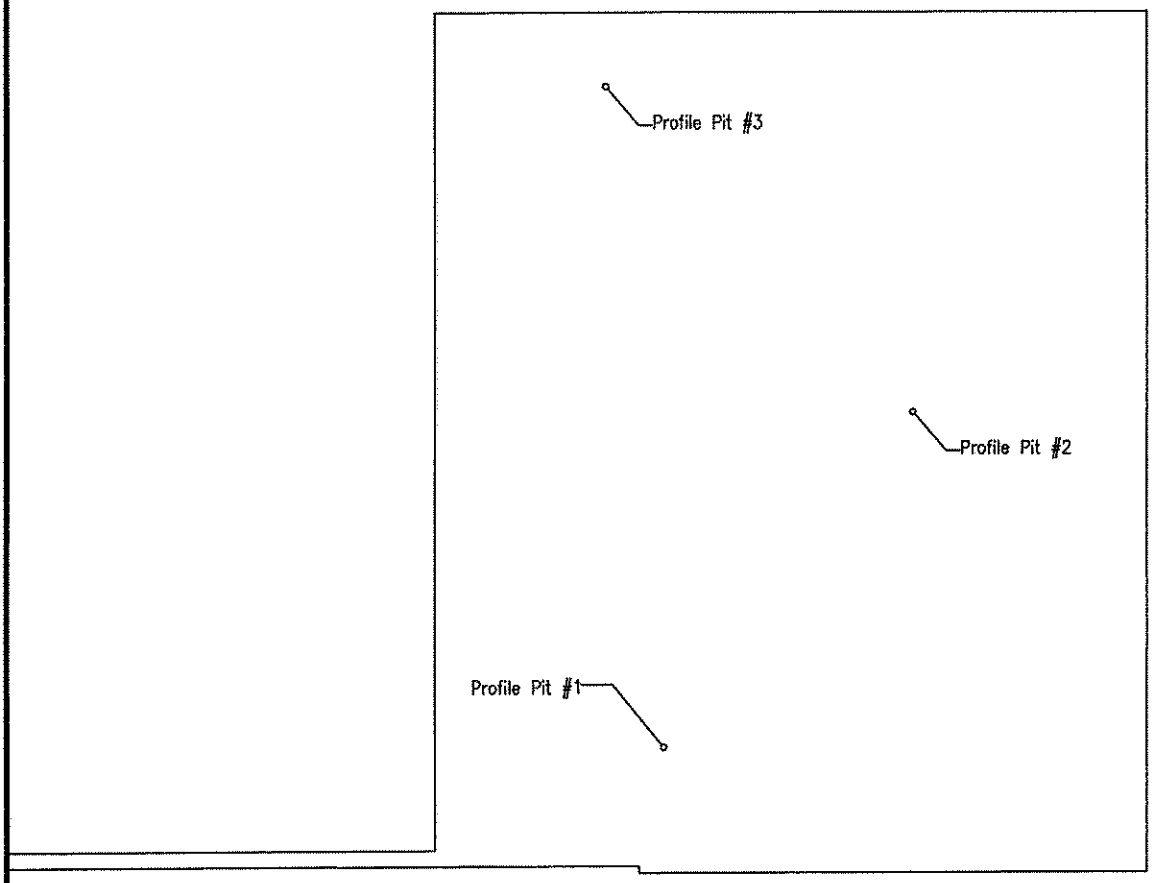
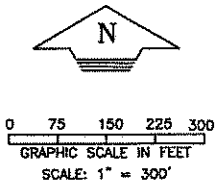
GEOQUEST LLC

SITE MAP

15630 Fox Creek Lane
El Paso County,
Colorado
Job #18-0975



Location from Northwest Lot Corner to Profile Pit #1:
S. 73° E. – 1188'
Location from Profile Pit #1 to Profile Pit #2:
N. 54° E. – 645'
Location from Profile Pit #2 to Profile Pit #3:
N. 47° W. – 690'
GPS Coordinates:
Pit 1; N. 39° 03' 38.47" W. 104° 41' 39.06"
Pit 2; N. 39° 03' 43.84" W. 104° 41' 34.07"
Pit 3; N. 39° 03' 48.88" W. 104° 41' 40.09"



United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for El Paso County Area, Colorado

June 6, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

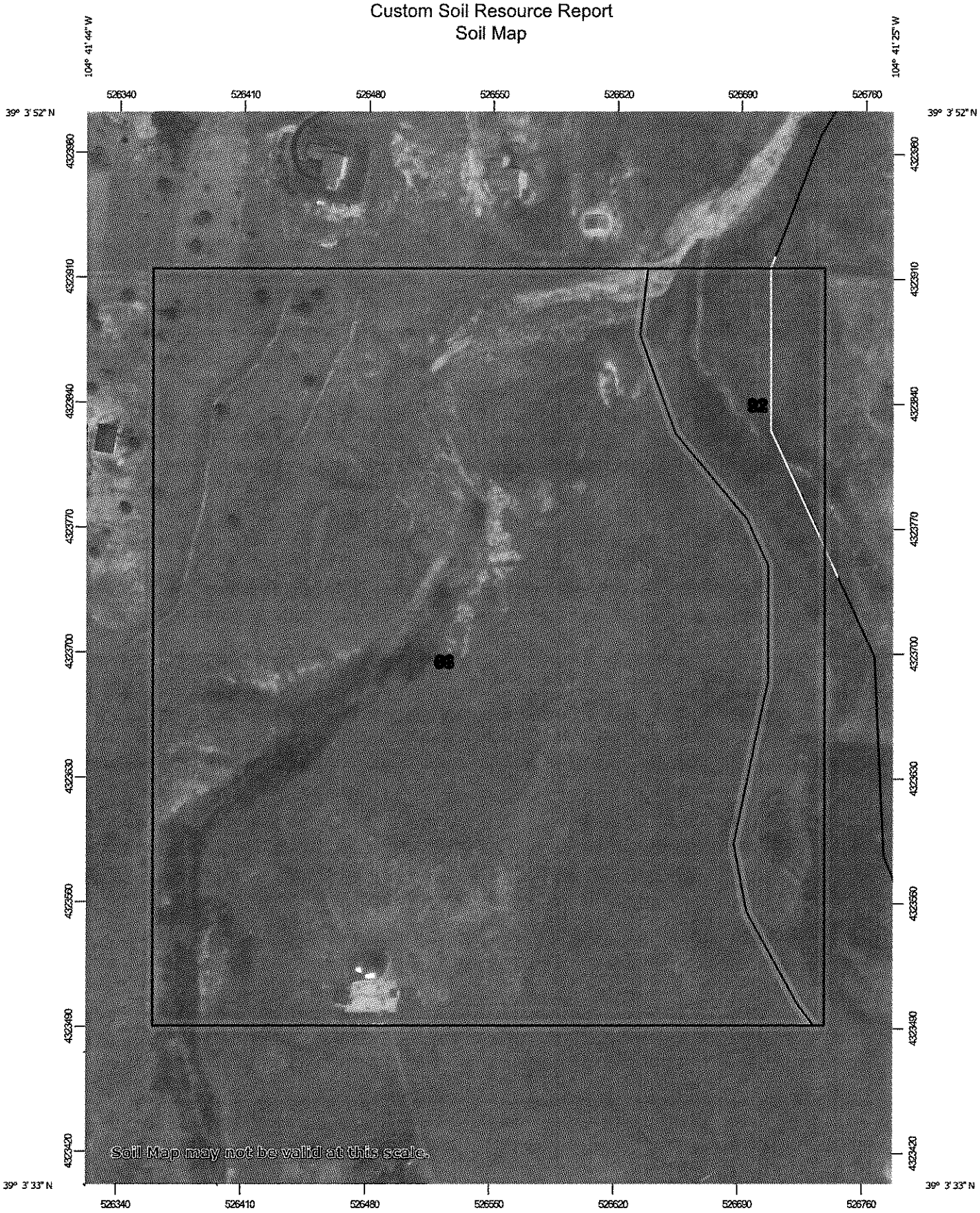
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:2,930 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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: Jun 7, 2016—Aug 17, 2017

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
68	Peyton-Pring complex, 3 to 8 percent slopes	34.3	86.0%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	5.6	14.0%
Totals for Area of Interest		**39.8**	**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

68—Peyton-Pring complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369f
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 40 percent
Pring and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam
Bt - 12 to 25 inches: sandy clay loam
BC - 25 to 35 inches: sandy loam
C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
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 7.3 inches)

Interpretive groups

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

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Park (R048AY222CO)
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

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

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