W.W. ENTERPRISES Consulting Engineering
2115 9th Street, P.O. Box 1242, Limon, Colorado 80828 (719) 775-9314

Revised October 14, 2020
August 14, 2020
Project No: 19-3028

Please see previous comment from Review #1 that has not been addressed:

"Per LDC Section 8.4.8 (C), the OWTS report should demonstrate that each lot proposed has a minimum of two sites appropriate for OWTS which do not fall into the restricted areas shown on the Preliminary Plan, soils and geology report, or delineated wetland or floodplain maps. There is no map showing the lots and the studied and acceptable locations for two potential OWTS sites per lot."

Please refer to the following resolution for updated requirements for the OWTS report. See Specifically Section 8.4.8(C) and Section 8.4.8(E)(2)(e)

https://assets-planningdevelopment.elpasoco.com/wp-content/uploads/LDC-Resolution/19-329-BOCC-Subdivsion-REGS.pdf

DESCRIPTION: 17055 Red Barn Road, Peyton,
El Paso County, Colorado

Prepared for:
Alice Jolene Owens
PO Box 2764
Florence, AZ 85132
719-596-7447

COLORADO REGISTERED
ANTHONY J. WERNSMAN
30318
10-26-20
PROFESSIONAL ENGINEER

SOILS INVESTIGATION FOR THE ON-SITE WASTEWATER TREATMENT SYSTEM (OWTS)

SITE AND SOIL EVALUATION

PRELIMINARY INVESTIGATION

A. Property Information

1) The site address will be 17055 Red Barn Rd., Peyton, Colorado.
2) The site legal description is the *SW 1/4* of the NW 1/4 of Section 13, T. 11 S., R. 64 W. of the 6th P.M., El Paso County, Colorado.
3) Currently there are no buildings on the site. The property is to be subdivided into seven (7) residential lots. Test pits were excavated and evaluated near the center of the property and near the south property line. Houses with OWTSs are on the properties surrounding the site.
4) It is assumed that water wells will be needed for each subdivided lot. The wells are to be located at least 100' from any existing or constructed OWTS.

B. Department Records

Maps for the property were provided and used for the Location Maps in the report. The contour line information was taken from site observations at the time of test pit evaluation, the Eastonville Quad Map.

C. Published Site Information

1) Topography

The Eastonville Quad Map were reviewed and indicates slopes consistent with the observed site topography. The slopes on the site are shown on the Location Maps in the report.

2) Soil Data

The "Soil Survey of El Paso County, Colorado" from the NRCS was reviewed *(see attached Natural Resources Conservation Service Web Soil Survey – National Cooperative Soil Survey). Five (5) soil types are on the property. Brussett loam, 1 to 3 % slopes (14) is on the approximate east third of the property. Brussett loam, 3 to 5 % slopes (15) is through the approximate center of the property from north to south. Peyton sandy loam, 5 to 9 % slopes (67) is at the southeast property corner. Peyton-Pring complex, 3 to 8 % slopes (68) is on the east property lines near the northeast property corner. Petyon-Pring complex, 8 to 15 % slopes (69) is along the west property line and on the north property line near the northeast corner of the property.*

The Brussett loam (14) is well drained with low runoff. It has no frequency for flooding or ponding. Its maximum salinity is non-saline to very slightly saline, and its available water capacity is high.

The Brussett loam (15) is well drained with low runoff. It has no frequency for flooding or ponding. Its maximum salinity is non-saline to very slightly saline, and its available water capacity is high.

The Peyton sandy loam (67) is well drained with medium runoff. It has no frequency for flooding or ponding. Its available water capacity is moderate.

The Peyton-Pring complex (68) is well drained with low runoff. It has no frequency for flooding or ponding. Its available water capacity is moderate.

The Peyton-Pring complex (69) is well drained with medium runoff. It has no frequency for flooding or ponding. Its available water capacity is moderate.

D. Location of Physical Features

The proposed house locations will be on each of the *seven (7)* subdivided lots. It is assumed that the proposed OWTS locations will be down slope from the house locations on each lot. The slope across the site is to the east. Refer to the Location Maps in the report for additional details.

E. Preliminary Soil Treatment

From previous experience with the soils in the area and the slope at the site, it is anticipated that a gravity flow OWTS can be used.

F. Other Information Requested

Currently, no additional information has been requested.

G. Additional Information

1) Survey

Property markers were not located, but it appears that the *east, south, and west* surrounding fences match the property lines. Therefore, it appears that the property has been surveyed.

2) Easements

Easements are around the entire property and along the property line of each lot. A 20 PUD is around the entire property. A 20' PUD (10' on each lot) is on the property lines between the lots. A 5' PIE and 10' PUD are along Red Barn Road.

3) Floodplain Maps

Kiowa Creek is approximately 2 miles west of the property. The proposed OWTS area is a least 100' upslope from the creek. Therefore, the site is not in the flood plain of the creek.

4) Geology and Basin Maps and Descriptions

The 1979 Ogden Tweto "Geologic Map of Colorado" was reviewed. The map indicates that Tdu – Upper Part of the Dawson Arkose is at the site. These include arkosic sandstone, conglomerate, and shale.

The 2012 Matthew L. Morgan and Peter E. Barkmann "Eastonville Quadrangle Geologic Map, El Paso County, Colorado" was also reviewed. The map indicates that three (3) soil and rock types are on the property. Gravel of Palmer Divide (QPg) is on the majority of the property. Dawson Formation – Facies unit five (Tkdas) is along the west property line. Alluvium one (Qal) is in the drainages near the center of the north property line and near the northeast property corner.

5) Aerial Photographs

Satellite maps of the area were reviewed to see if any items of note were apparent. The topography, vegetation, existing structures surrounding the property, and drainages to the west were noted.

6) Climate Information

From the USDA 25-YEAR 24 HOUR PRECIPITATION annual isopluvials for Colorado, the site is in an area of approximately 36" of evaporation per year.

7) Delineated Wetlands Maps

The property is covered with native grasses, small brush (weeds), and pine trees. The up and down slope areas of this area of the property appear to have the same vegetation throughout. Therefore, it appears that the moisture content across the site is consistent, and no wetlands are present.

RECONNAISSANCE VISIT

A. Landscape Position

The entire property is a rectangle with long dimension north to south. The property is to be subdivided into *seven (7)* residential lots. The house locations are to be determined after the land is subdivided. The proposed OWTSs for each lot are to be located downslope from the house location to provide for gravity flow.

B. Topography

The proposed OWTSs are to be located down slope from the future house locations. It is anticipated that gravity flow should be available.

C. Vegetation

The vegetation on the site is native grasses, small brush (weeds), and trees. They appear consistent across the proposed OWTS area on the property.

D. Natural and Cultural Features

The natural features on the property are the slopes and vegetation. No cultural features were observed.

E. Current and History Land Use

Historically, the site has been used for rangeland. The proposed areas for the new OWTSs is located down slope from the future house locations. It is anticipated that the undeveloped portions of the properties in the area are to remain as native grass.

DETAILED SOIL INVESTIGATION

A. Soil Investigation

Seven (7) lots are proposed for the property. Twenty percent (20%) of the lots are to be evaluated, which is 7 lots x 0.20 = 1.4 lots. Therefore, 2 locations were evaluated. Method Used: Visual and tactile evaluation from two or more soil profile test pit excavations. Two (2) pairs of test pits were excavated and evaluated on the property. The soils investigation, evaluation, and sampling for the test pits was performed on August 14, 2020. The soils were evaluated in the field and laboratory. The test pit pairs are located near the south property line and near the center of the property. The Location Map and Log of Test Pits provide the information for the site and soil encountered.

B. Percolation Test

A percolation test was not performed.

C. Visual and Tactile Evaluation

The soils were observed and tested in the field and laboratory by Joe Wernsman under the supervision of Anthony J. Wernsman, P.E., who has been working as a field (soil drilling, sampling, testing and percolation tests) and laboratory (sieve analysis, Atterberg Limits, etc.) technician since 1989.

SOIL DESCRIPTIONS FOR DETERMINATION OF A LIMITING CONDITION

A. Soil Horizon Depth

The test pit site observations were used to generate the Log of Pits included with this report.

B. Depth to Bedrock

Bedrock was not encountered in the test pits.

C. Depth to Periodically Saturated Soil

1) Redoximorphic features

No redoximorphic features were encountered.

2) Standing Water

No standing water was observed in the test pits or on the property.

D. Any Other Soil Characteristics

Two (2) pairs of test pits were evaluated.

North Pits

The soils at the site varied in the test pits. Topsoil with roots overlies the site. Light brown, damp, clayey sand was encountered beneath the topsoil to an approximate depth of 4' in TP1. Tan, damp, silty sand was encountered beneath the upper clayey sand to the 8' bottom of test pit depth in TP1. Tan, damp, sandy silty clay was encountered beneath the topsoil to the 8' bottom of test pit depth in TP2. The upper silty sand is Soil Type 2A sandy loam with blocky (bk) soil structure and moderate (2) to weak (1) soil grade. The lower silty sand in TP1 is Soil Type 1 loamy sand with no soil structure and single grain (0) soil grade. The sandy silty clay in TP2 is Soil Type 3 sandy clay loam with blocky (bk) soil structure and moderate (2) soil grade The Soil type 3 sandy clay loam is the most limiting soils encountered. Therefore, a new system in this area would need to be sized, using an LTAR of 0.35 gpd/sf.

South Pits

The soils at the site are consistent in the test pits. Topsoil with roots overlies the site. Light brown, damp, sandy silty clay was encountered beneath the topsoil to the 8' bottom of test pit depths. The sandy silty clay is Soil Type 3 sandy clay loam with blocky (bk) soil structure and moderate (2) soil grade. The Soil type 3 sandy clay loam is the most limiting soils encountered. Therefore, a new system in this area would need to be sized, using an LTAR of 0.35 gpd/sf.

CONSTRUCTION, LAND USE, AND DIFFICULTIES

The slopes at the site will require that the trenches be oriented parallel to the contour lines (perpendicular to the slope). The undeveloped properties in the area will continue to be agricultural fields. No difficulties were encountered during the site evaluation.

HOLE AND PIT MARKING

The test pits at the site were left open at the time of evaluation. Their location can be determined from the open test pits or by the ground scar from filled test pits and the locations shown on the Location Maps.

TEST PIT RESULTS

On August 14, 2020 a subsurface investigation was conducted at this site by WW Enterprises. Two (2) pairs of test pits were evaluated.

North Pits

The soils at the site varied in the test pits. Topsoil with roots overlies the site. Light brown, damp, clayey sand was encountered beneath the topsoil to an approximate depth of 4' in TP1. Tan, damp, silty sand was encountered beneath the upper silty sand to the 8' bottom of test pit depth in TP1. Tan, damp, sandy silty clay was encountered beneath the topsoil to the 8' bottom of test pit depth in TP2. The upper silty sand is Soil Type 2A sandy loam with blocky (bk) soil structure and moderate (2) to weak (1) soil grade. The lower silty sand in TP1 is Soil Type 1 loamy sand with no soil structure and single grain (0) soil grade. The sandy silty clay in TP2 is Soil Type 3 sandy clay loam with blocky (bk) soil structure and moderate (2) soil grade The Soil type 3 sandy clay loam is the most limiting soils encountered. Therefore, a new system in this area would need to be sized, using an LTAR of 0.35 gpd/sf.

South Pits

The soils at the site are consistent in the test pits. Topsoil with roots overlies the site. Light brown, damp, sandy silty clay was encountered beneath the topsoil to the 8' bottom of test pit depths. The sandy silty clay is Soil Type 3 sandy clay loam with blocky (bk) soil structure and moderate (2) soil grade. The Soil type 3 sandy clay loam is the most limiting soils encountered. Therefore, a new system in this area would need to be sized, using an LTAR of 0.35 gpd/sf.

SIZE AND DESIGN-BASIS

The following items were used to determine the size of the required Onsite Wastewater Treatment System (OWTS) for the proposed site.

* Future houses. Number of bedrooms to be determined in the future.
* Assumed 3 bedrooms per house for this report.
* Soil Type 3 sandy clay loam soils.
* LTAR of 0.35 gpd/sf used for sizing the system.
* Chamber trench system.
* No flow from water softener, spas, or pools.

ENGINEERED SYSTEMS

With the Soil Type 3 sandy clay loam soil at the site, an engineered system is not required for this system. A gravity flow trench system is to be used for the site. Groundwater and restrictive layers were not encountered, the ground slope is less than 20 degrees, and pressure distribution is not to be used.

CALCULATION OF INFILTRATIVE SURFACE OF SOIL TREATMENT AREA

A. The bottom area of trenches is the only infiltrative surface. No sidewall credit is allowed or taken.

B. The long-term acceptance rate (LTAR) for the sandy loam soil at the site is 0.35 gallons per day per square foot (gal/day/sf), per Table 10-1, and is to be used for sizing this system.

C. The site evaluation included visual tactile evaluation and laboratory testing of the soils at the property. The lesser LTAR was used to determine the size of the soil treatment area.

D. The factors for adjusting the size of the soil treatment area were taken from Tables 10-2 and 10-3. The size adjustment factors for methods of application for a bed is 1.2 for gravity method of effluent application from treatment unit preceding soil treatment area. The size adjustment factor for types of distribution media is 1.0 for beds when rock and pipe are used.

E. The required area for a soil treatment area is determined by the following formula:

$$\text{Soil Treatment Area (STA) (in square feet)} = \frac{\text{Design Flow (gal/day)}}{\text{LTAR (gal/day/sf)}}$$

1) Adjusted Soil Treatment Area = Required Soil Treatment Area x Size Adjustment Factor(s).
2) Size adjustment factors for methods of application are in Table 10-2.
3) Size adjustment factors for types of storage/distribution media are in Table 10-3.
4) The required soil treatment area is receiving TL1 effluent and may be multiplied by one size adjustment factor from Tables 10-2 and 10-3, or both.
5) The soil treatment area is receiving TL1 effluent, so it is not required to be pressure dosed.

ALLOWABLE SOIL TREATMENT AREA REDUCTIONS AND INCREASES

A. The soil treatment area size is determined by dividing the design flow rate by the long-term acceptance rate may be adjusted by factors for method treatment, soil treatment area design, and type of distribution media.

B. For the purpose of Tables 10-2 and 10-3, a "baseline system" (adjustment factor of 1.00) is considered to be TL1 applied by gravity to a gravel-filled trench.

C. The maximum reduction from all combined reductions including higher level treatment shall be not greater than 50 percent (50%) of the baseline system required for a soil treatment area.

D. The higher-level treatment categories listed in Table 6-3 do not apply for this system.

DESIGN OF DISTRIBUTION SYSTEMS

The design of the distribution system was done per Section 8.10 of Regulations of the El Paso County Board of Health, El Paso County, Colorado Chapter 8 "Onsite Wastewater Treatment Systems (OWTS)" for the El Paso County Health Department.

A. General

1) The infiltrative surface and distribution lines must be level.
2) The infiltrative surface must be no deeper than four feet (4'). The depth will be measured from the downslope side of the trench.
3) Trenches must follow the ground surface contours so variations in infiltrative surface depth are minimized.
4) Pipe for gravity distribution must be no less than three-inch (3") diameter.
5) A final cover of soil suitable for vegetation at least ten inches (10") deep must be placed from the top of the geotextile or similar pervious material in a rock and pipe system, chamber, or manufactured media up to the final surface grade of the soil treatment area.
6) Following construction, the ground surface must be graded to divert storm water runoff or other outside water from the soil treatment area. The area must be protected against erosion. Subsurface drains upslope of the soil treatment area may be installed to divert subsurface flow around the area.
7) Backfilling and compaction of soil treatment areas shall be accomplished in a manner that does not impair the intended function and performance of the storage/distribution median and soil and distribution laterals, allows for the establishment of vegetative cover, minimizes settlement, and maintains proper drainage.

B. Distribution Lines

1) Distribution lines in a soil treatment area must be as even as possible. Uneven settling of portions of the distribution system following construction must be addressed by provisions in the design to adjust flows between lines.
2) Distribution lines shall be a maximum 150' long. These will not be used in this system.
3) Distribution lines longer than 100' shall be pressure dosed. This does not apply for this site, as pressure dosing will not be used.
4) The end of a distribution pipe or chambers must be capped, unless it is in a bed or trenches in a level soil treatment area, where the ends of the lines may be looped.

C. Inspection Ports

1) The bottom of the inspection port tube must extend to the infiltrative surface and not be connected to the end of the distribution pipe.
2) Additional inspection ports connected to distribution pipes may be installed.
3) The top of the inspection ports may be below the final grade of the surface if each has a cover at the surface such as a valve box for a lawn irrigation system.

D. Trenches
   1) Trenches must be three feet (3') wide or less.
   2) The separating distance between trenches must be a minimum of six feet (6'), sidewall-to-sidewall.
   3) Chambers used in a trench must be as close to the center of the trench as possible.

E. Beds
   Beds will not be used for this system.

F. Serial and Sequential Distribution
   1) A serial or sequential distribution system may be used where the ground slope does not allow for suitable installation of a single, level soil treatment area unless a distribution box or dosing chamber is used. For the slopes on the site, it is not anticipated that this will be needed.
   2) The horizontal distance from the side of the absorption system to the surface of the ground on a slope must be adequate to prevent lateral flow and surfacing.
   3) Adjacent trenches or beds must be connected with a stepdown/relief line or a drop box arrangement such that each trench fills with effluent to the top of the gravel or chamber outlet before flowing to succeeding treatment area.

G. Storage/Distribution Media
   1) Rock and Pipe
      Rock and Pipe will not be used for this system.
   2) Tire Chips
      Tire chips will not be used for this system.
   3) Chambers
      Infiltrator Quick 4 Chambers will be used for this system.
   4) Manufactured Media
      Manufactured media will not be used for this system.

H. Pressure Distribution
   Pressure distribution will not be used for this system.

I. Driplines
   Driplines will not be used for this system.

SOIL REPLACEMENT

Soil replacement will not be used for this system.

SEPTIC TANK

Per Table 9-1, the minimum septic tank size based on the number is bedrooms is a 1000-gallon tank capacity for 3 bedrooms. The septic tank is to be designed for a maximum 48" buried depth.

DISTRIBUTION BOX

It is recommended that a variable rate distribution box be used. A variable rate distribution box is to also be used for the new beds to evenly distribute the effluent between the beds. This will also allow for future adjustment of effluent to each line, if needed.

DESIGN OF SOIL TREATMENT AREA (STA)

Table 6-1 Single-Family Residential Design Flows indicates the effluent flows for design. For an assumed 3-bedroom house, a design flow of 450 gallons per day is to be used for OWTS sizing.

Soil Treatment Area (STA) = Design Flow (gallons per day) / LTAR (gal/day/sf)
= 450 gallons per day / 0.35 gal/day/sf
= 1286 square feet (sf).

Adjusted Soil Treatment Area = Required STA x Size Adjustment Factor(s)
Trench Area = 1286 sf x 1.0(for trench) x 0.7(for chambers)
= 900 sf

Trench Calculations

900 sf / 3' wide chambers = 300' length of trenches.
300' / 3 trenches = 100' long trenches. Each trench will have 100' / 4' per chamber = 25 chambers. The total number of chambers needed is 25 chambers per trench x 3 trenches = 75 chambers.

Use 3 trenches 100' long.

SETBACKS

Minimum setbacks are required for the future OWTSs on the seven (7) proposed lots. These setbacks include 10' to property lines (side setback), 20' for house, and 100' for the water wells, including the property water well and the neighboring property water wells.

RECOMMENDATIONS

Recommended are a septic tank of the required size followed by a standard absorption trench system with chamber construction. For an assumed 3-bedroom house, the chamber trench system is to be constructed with a bottom area of 900 square feet (3 trenches with 100' length). The trench system is to be constructed in accordance with the design criteria discussed in Section 8.10 of Regulations of the El Paso County Board of Health, El Paso County, Colorado Chapter 8 "Onsite Wastewater Treatment Systems (OWTS)" for the El Paso County Health Department. Refer to the attached "Septic Design" drawings (page 1 through 3) for the typical layout and details of the future systems. Each of the seven (7) properties are to have their own site specific OWTS evaluation, once the proposed house and proposed OWTS locations are determined.

INSPECTION

W.W. Enterprises and the El Paso County Health Department will conduct a final inspection of this Onsite Wastewater Disposal System. The contractor is to contact us no sooner than 24-hours prior to the final inspection. All components will be visible to the inspector. As-built drawings will be provided to the Owner after the final inspection.

MAINTENANCE

The Maintenance of your Onsite Wastewater Disposal System is very important.

1. Direct surface water away from the trenches. Lawn irrigation equipment should not be placed above or near the trenches.
2. Seed the soil above the trench with native grasses. Sun light is an important part of the dispersion of the wastewater.
3. The septic tanks should be cleaned out by a licensed contractor every two years or as required.
4. The use of a water softener will increase the amount of wastewater entering the system and is not recommended. If a water softener is used, a separate leaching system should be constructed. Contact El Paso County Health Department for further details on water softeners.
5. Refer to Appendix I - "General Maintenance Recommendations for Onsite Wastewater Treatment Systems (OWTS)" for additional recommendations.

GENERAL

The findings and recommendations of this report have been obtained in accordance with accepted engineering practices in the field of Geotechnical Engineering. There is no other warranty, either expressed or implied.

All future owners should be directed to those items under "General Maintenance Recommendations for Onsite Wastewater Treatment Systems (OWTS)" in Appendix I, included in this report.

If there are any questions concerning information in this report, please contact our office.

If the consistency or color of the soil is different than in the soils report, contact this office immediately.

Soil Map—El Paso County Area, Colorado

Map Scale: 1:3,050 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

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 18, Jun 5, 2020

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
14	Brussett loam, 1 to 3 percent slopes	20.0	51.5%
15	Brussett loam, 3 to 5 percent slopes	12.4	32.1%
67	Peyton sandy loam, 5 to 9 percent slopes	0.0	0.0%
68	Peyton-Pring complex, 3 to 8 percent slopes	0.2	0.5%
69	Peyton-Pring complex, 8 to 15 percent slopes	6.1	15.8%
Totals for Area of Interest		**38.7**	**100.0%**

El Paso County Area, Colorado

14—Brussett loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367j
Elevation: 7,200 to 7,500 feet
Frost-free period: 115 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Brussett

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

A - 0 to 8 inches: loam
BA - 8 to 12 inches: loam
Bt - 12 to 26 inches: clay loam
Bk - 26 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 3 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
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: R048AY222CO
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

El Paso County Area, Colorado

15—Brussett loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 367k
Elevation: 7,200 to 7,500 feet
Frost-free period: 115 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Brussett

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

A - 0 to 8 inches: loam
BA - 8 to 12 inches: loam
Bt - 12 to 26 inches: clay loam
Bk - 26 to 60 inches: silt 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
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R048AY222CO
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

El Paso County Area, Colorado

67—Peyton sandy loam, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369d
Elevation: 6,800 to 7,600 feet
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 115 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 85 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: 5 to 9 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 (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 capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XB216CO - Sandy Divide
Hydric soil rating: No

Minor Components

Pleasant

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

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

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
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 capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R049XB216CO - Sandy Divide
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
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 capacity: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO
Hydric soil rating: No

Minor Components

Pleasant

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

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

El Paso County Area, Colorado

69—Peyton-Pring complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 369g
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 clay loam
C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 8 to 9 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 (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 capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XB216CO - Sandy Divide
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: 8 to 15 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): 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 capacity: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R049XB222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

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

Other soils

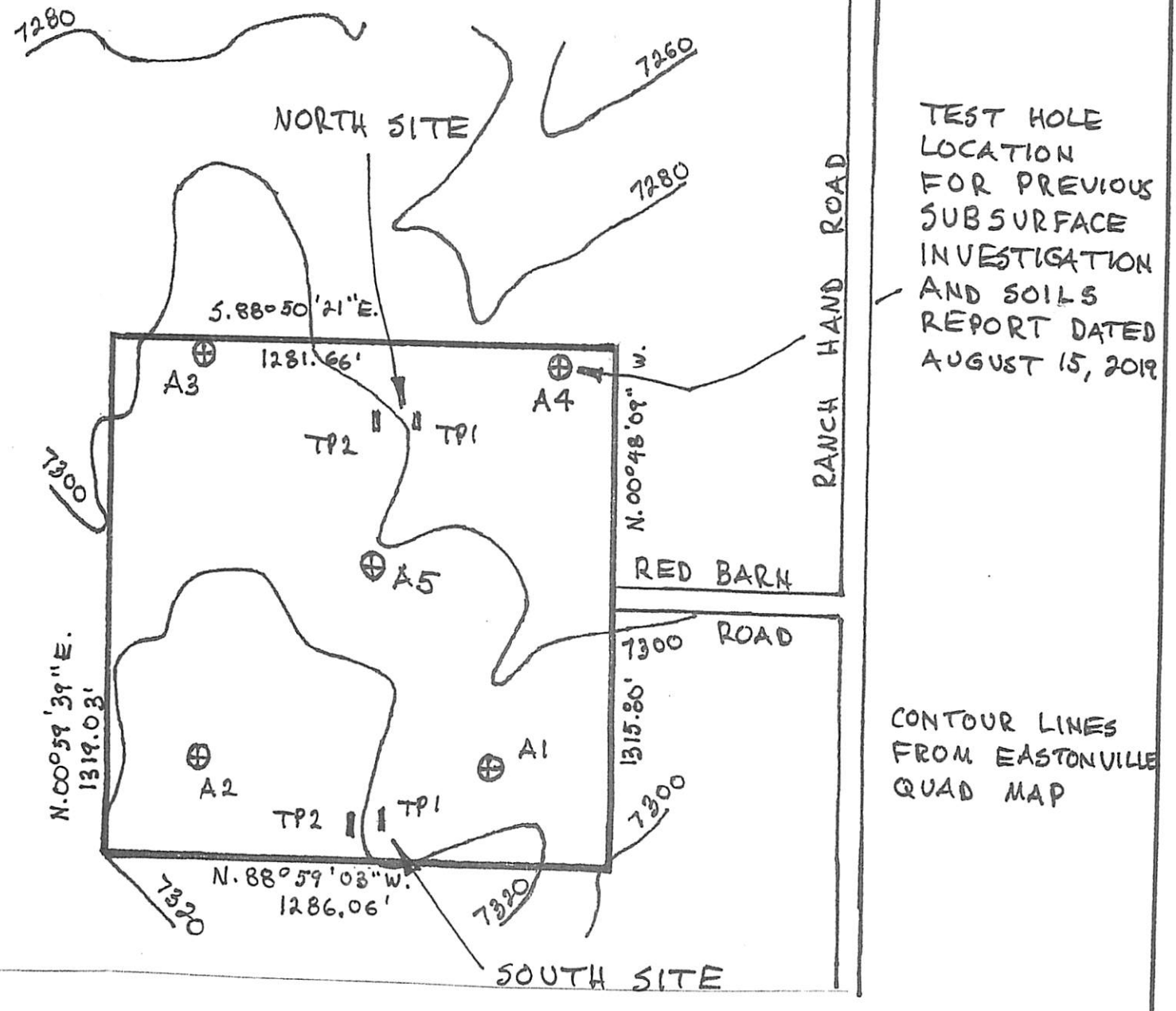
Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

LOCATION MAP

SW 1/4 NW 1/4 OF SECTION 13, T. 11 S., R. 64 W., EL PASO COUNTY, COLORADO.



TEST HOLE LOCATION FOR PREVIOUS SUBSURFACE INVESTIGATION AND SOILS REPORT DATED AUGUST 15, 2019

CONTOUR LINES FROM EASTONVILLE QUAD MAP

SCALE: 1" = 400'

0 100 200 400 800 1200 1600

17055 Red Barn Road, Peyton, El Paso County, Colorado.

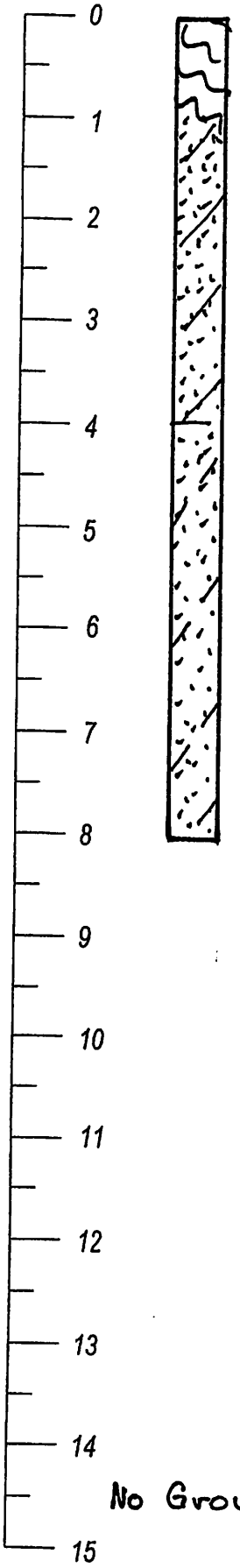
Name: Owens
Project No.: 19-3028

W.W. ENTERPRISES

LOG OF TEST PITS

NORTH SITE

TP1

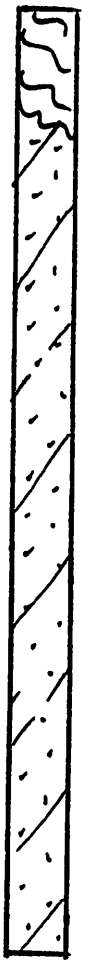


Topsoil with roots

Light brown, damp, clayey sand
(Sandy Loam)

Tan, damp, silty sand
(Loamy Sand)

TP2



Topsoil with roots

Tan, damp, sandy silty clay
(Sandy Clay Loam)

No Groundwater Encountered.

Name: Owens
Project No.: 19-3028

W.W. ENTERPRISES

LOG OF TEST PITS

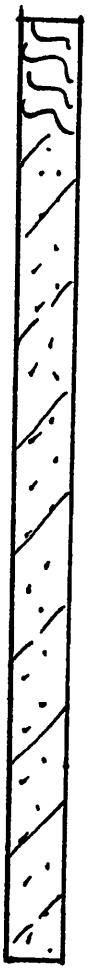
SOUTH SITE

TP1

Topsoil with roots.

Light brown, damp, Sandy silty clay (Sandy Clay Loam)

TP2



Topsoil with roots

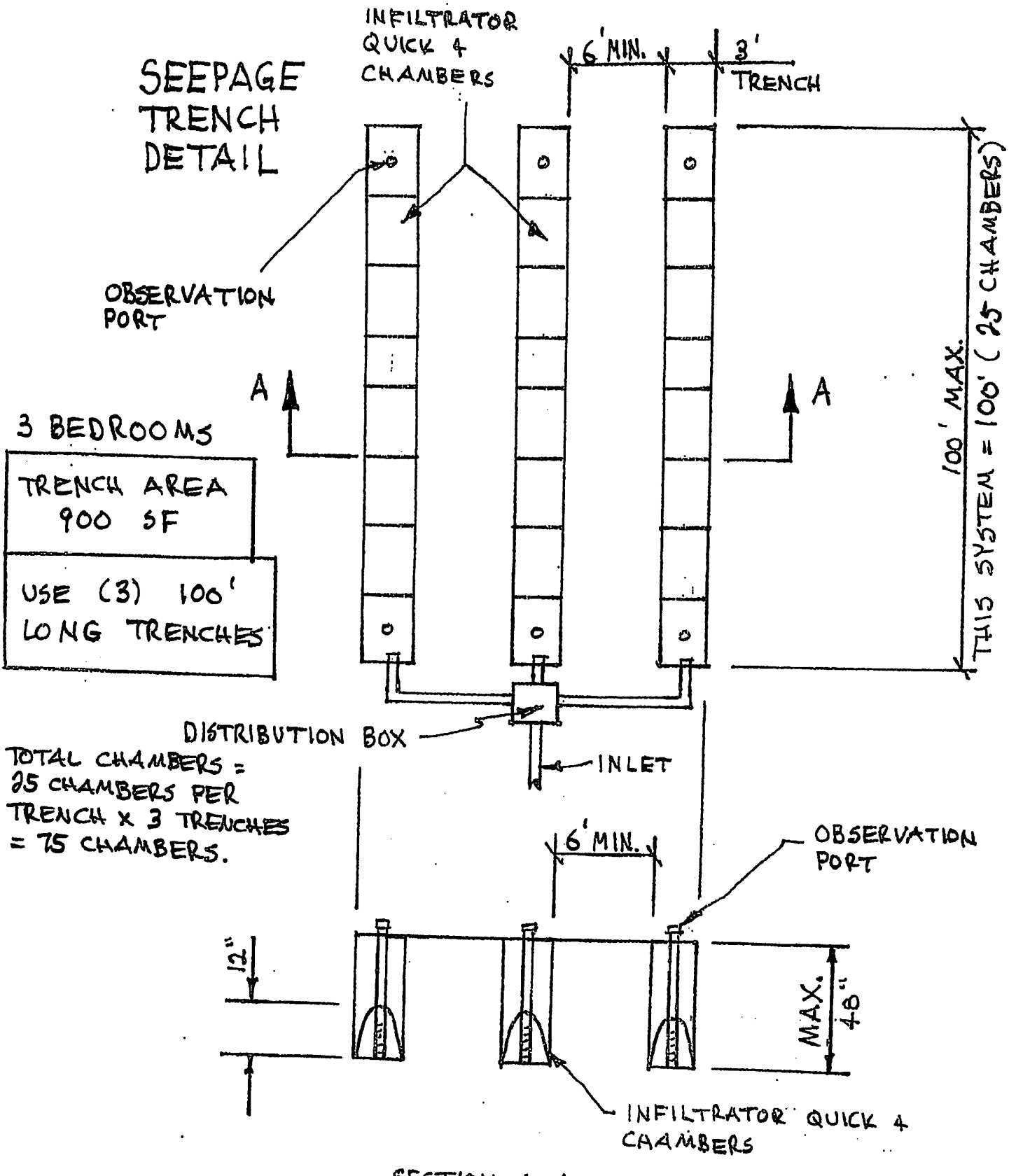
Light brown, damp, Sandy silty clay (Sandy Clay Loam)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

No Groundwater Encountered.

Name: Owens
Project No.: 19-3028

SEEPAGE TRENCH DETAIL



3 BEDROOMS

TRENCH AREA 900 SF
USE (3) 100' LONG TRENCHES

TOTAL CHAMBERS = 25 CHAMBERS PER TRENCH x 3 TRENCHES = 75 CHAMBERS.

SECTION A-A

W.W. ENTERPRISES
P.O. Box 1242,
Limon, CO 80828

OWTS STANDARD ABSORPTION TRENCH DESIGN

PROJECT NO. 19-3028

KEY	
A	1000 GAL. 2 COMP. SEPTIC TANK FOR 3 BEDROOMS
B	4" SCHED. 40 PVC PIPE FROM SEPTIC TANK TO D-BOX.
C	DISTRIBUTION BOX ELEV. MAX 3.5'± DEPTH
D	4" SCHED. 40 PVC DISCHARGE PIPES -D-BOX TO TRENCHES
E	OUTLET PIPE FLOWLINE PER TANK. BASEMENT SLAB PER GRADE.
F	SEPTIC TANK OUTLET ELEV. = MAX. 4' DEPTH
G	TRENCHES - BOTTOM MAX. 4' BELOW GRADE

W.W. ENTERPRISES
P.O. Box 1242,
Limon, CO 80828

OWTS SYSTEM LAYOUT PLAN -TRENCH-

PROJECT NO. 19-3028

1. Bottom of surface of bed should be roughened before construction of bed and trenches to avoid having a penetration resistant interface between natural soil and fill.

2. Distribution pipes should be laid level. The pipes should be interconnected for beds.

3. A layer of straw or paper shall be used between the gravel and backfill. Four inches (4") of "pea" gravel may be substituted for the straw or paper. NA for chambers.

4. Backfill shall consist of natural on-site material. Heavy clays should not be used as back-fill. The upper four inches (4") shall be suitable soil for supporting vegetation.

5. Top of bed shall be side-sloped about two percent (2%) and promote positive drainage away from the bed. The maximum slope for any septic system is thirty percent (30%).

6. Surface of bed not usable under traffic areas, either animal or machinery. Vegetation over bed should be durable and tolerate both wet and dry periods.

7. Surface of bed and trenches should receive sunlight. Shade trees near system not recommended.

8. This system to meet all applicable El Paso County Health Department Rules and Regulations set forth in the Individual Sewage Disposal System Regulations.

9. A representative of W. W. Enterprises and the El Paso County Health Department should be contacted for Inspection prior to placement of backfill. Inspections by the Engineer are an additional charge.

APPENDIX I

GENERAL MAINTENACE RECOMMENDATIONS FOR

ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)

The following recommendations, if followed, should help increase the lifetime of the system:

1. Septic tanks should be pumped a minimum once every four (4) years.
2. Septic tanks and distribution boxes should be checked at least once a year for sludge accumulation which may clog the leach area if overflow occurs.
3. The leach area should not be used for grazing, sports activities, traffic, or other activity which may compact the soils.
4. Schedule 40 pipe should be used if lines are to be placed under driveways.
5. Trees should not be planted near the leach area so as to prevent roots from clogging the system.
6. If trees are to be planted nearby, they should be located so that the leach area is not shaded.
7. Overuse of strong chemicals, which may kill the bacteria in the system and inhibit decomposition of the sewage, should be avoided.
8. Positive drainage should be maintained over and around the absorption field area to prevent pooling of water.
9. Lines to the tank or leach area should have sufficient ground cover to prevent freezing.