

November 2, 2022



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
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Paula Donohoo
8855 Walker Road
El Paso County, CO 80908

Re: Soil, Geology, and Geologic Hazard Study
Parcel No. 51100-01-009
High Forest Estates Subdivision, Filing No. 1
8855 Walker Road
El Paso County, Colorado
Entech Job No. 221954

Dear Ms. Donohoo:

The project consists of subdividing 13.81-acres; two rural residential lots are proposed as part of the subdivision. An existing home on Lot 2 will remain, and one new lot is proposed. The site is located northeast of the intersection of Walker Road and Table Rock Road, in northern El Paso County.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the SW $\frac{1}{4}$ of Section 10 Township 11 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 10 miles east of the town of Monument, northeast of the intersection of Walker Road and Table Rock Road, in El Paso County, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is gradually sloping to the west-northwest with steeper slopes along the drainage on the site. A drainage bisects the site from the southeast to the northwest with a pond in the west-central portion of the site. Water was not observed in the drainage or pond at the time of this investigation, however, review of historical photographs indicates the pond typically has water. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped agricultural and rural residential. The site contains field grasses, weeds, and sparsely scattered trees and ponderosa pines across. The existing house with a water well and septic system located on Lot 2, will remain. Site photographs were taken and site mapping was completed on was September 21, 2022. Site photographs are included in Appendix A. Test Borings and Test Pits were performed on September 28 and 29, 2022.

Total acreage involved in the proposed subdivision is 13.81-acres. Two rural residential lots are proposed as part of the subdivision. The proposed lot sizes range from 5.0-acres (Lot 1) and 8.81-acres (Lot 2). The existing house and out buildings located on Lot 2 will remain. The new lot will be serviced by an individual well and on-site wastewater treatment system. The Site Plan is presented in Figure 3.

LAND USE AND ENGINEERING GEOLOGY

This site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose some constraints on development and land use. These include areas of artificial fill, potentially expansive soils, potentially unstable slopes, potentially seasonal shallow groundwater, seasonal shallow groundwater. Based on the

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proposed development plan, it appears that these areas will have minor impacts on the development. These conditions will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either avoided or properly mitigated. All recommendations are subject to the limitations discussed in the report.

SCOPE OF THE REPORT

A general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.

FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on September 21, 2022.

One test boring was drilled, and two test pits were excavated on the site to determine general suitability of the soil characteristics for residential construction. The locations of the test boring/pits are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Test Boring and Test Pit Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on some of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422. Results of the laboratory testing are included in Appendix C.

PREVIOUS INVESTIGATIONS

A Soils Report was previously performed by Front Range Geotechnical, Inc. for the existing house on the site dated, May 20, 1999, Front Range Job No. 6461 (Reference 1, Appendix D). The investigation consisted of drilling two test borings to 15 feet in the building footprint of the existing structure.

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SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 2, Figure 4), previously the Soil Conservation Service (Reference 3) has mapped one soil type on the site. Complete descriptions of the soil type are presented in Appendix E. In general, the soils consist of sandy loam to loam. The soils are described as follows:

<u>Type</u>	<u>Description</u>
68	Peyton-Pring Complex, 3 – 8% Slopes

The soils have been described to have rapid permeabilities. The soils are described as well suited for use as home sites. Possible hazards with soils erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 3).

Soils

The soils encountered in the Test Boring and Test Pits can be grouped into two general soil and rock types. The soils were classified using the Unified Soil Classification System (USCS). The test pit soils were also classified using the USDA Textural Soil Classification.

Soil Type 1 is a silty to gravelly slightly silty sand and clayey sand (SM, SM-SW, SC). The sand soils were encountered in the test boring at the existing surface extending to 19 feet bgs, and in both test pits at the surface extending to the termination of the pits (8 feet). These soils were encountered at medium dense to dense states and at dry to moist conditions. Samples tested had approximately 10 to 22 percent of the soil size particles passing the No. 200 Sieve.

Soil Type 2 is a very sandy siltstone (ML). The siltstone was encountered in Test Boring No. 1 at an approximate depth of 19 feet bgs and extended to the termination of the boring (20 feet). The siltstone was encountered at hard consistencies and moist conditions. The siltstone had approximately 60 percent of the soil sized particles passing the No. 200 sieve.

Groundwater

Groundwater was not encountered in the test borings which were drilled to depths of 20 feet, or in the test pits which were excavated to depths of 8 feet. Signs of seasonally occurring groundwater was encountered in Test Pit No. 2 at 3 feet. Groundwater is not anticipated to affect shallow foundations on the majority of the site. A drainage bisects the site that portions have been mapped as either seasonally shallow groundwater and potentially seasonally shallow groundwater, and is discussed further later in this report. Fluctuations in groundwater conditions may occur due to variations in rainfall or other factors not readily apparent at this time. Isolated sand layers within the soil profile can carry water in the subsurface. Contractors should be cognizant of the potential for the occurrence of subsurface water features during construction.

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Geology

Approximately 14 miles west of the site is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within a large structural feature known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction (Reference 4). The bedrock underlying the site consists of the Dawson Formation of Tertiary to Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers of claystone or siltstone.

The geology of the site was evaluated using the *Geologic Map of the Black Forest Quadrangle*, by Thorson in 2003, (Reference 5, Figure 5). The Geology Map for the site is presented in Figure 6. Four mappable units were identified on this site which are described as follows:

- Qal Artificial Fill of Holocene Age:** These are recent stream deposits associated with the drainage on-site. These materials generally consist of silty to clayey sands and may contain clay lenses.
- Qaf Artificial Fill of Holocene Age:** These are man-made fill deposits associated with a small embankment in the eastern portion of Lot 1.
- Qa Channel and Floodplain Alluvium of late Holocene Age:** These are low terrace deposits consisting of silty to clayey sands that may contain clay lenses that were deposited along the active drainage in the western portion of the site.
- Qc/Tkd Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Black Forest Quadrangle* distributed by the Colorado Geologic Survey in 2003 (Reference 5, Figure 5), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1979 (Reference 6), and the *Geologic Map of the Denver 1° x 2° Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 7). The test borings and test pits logs used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

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ENGINEERING GEOLOGIC HAZARDS

Mapping has been performed on this site to identify areas where various geologic conditions exist of which developers should be cognizant during the planning, design and construction stages where new construction is proposed. The engineering geologic constraints identified on this site include artificial fill, potentially expansive soils, and potentially seasonal shallow groundwater, as indicated on the Engineering Geology Map, Figure 6. Potential Hazards including expansive soils and minor drainage swales, have also been addressed below. These hazards and recommended mitigation techniques are discussed as follows:

Artificial Fill - Constraint

These are areas of man-made fill associated with an existing dam located in the western portion of the site. The dam is currently in good condition; the inlet and outlet are visible, free of debris, and appear to be functional and in good condition. Areas of fill other than those mapped may exist on the site. The dam will be avoided by the proposed site development on Lot 1.

Mitigation: It is anticipated these areas would be avoided by development or regraded. Should any uncontrolled fill be encountered beneath foundations, removal and recompaction at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 will be required.

Expansive Soils - Constraint

Potentially expansive soils were encountered at 19 feet in Test Boring No. 1. Additionally, the Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers of claystone or siltstone. Expansive clays, if encountered beneath foundations, can cause differential movement in the structure foundation.

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements.

Slope Stability and Landslide Hazard

The majority of the slopes in the building areas on site are gently to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. However, the steeply sloping areas along the drainage on the site have been mapped as potentially unstable slopes. These areas are along the drainage and will be avoided by future site development. The recommendations for these areas are as follows:

• Potentially Unstable Slopes - Hazard

The slopes identified with this hazard exist on the hilltop above the unstable slopes on the northwestern portion of the site. These slopes are stable in their present condition, however,

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considerable care must be exercised in these areas not to create a condition which would tend to activate instability.

Mitigation: These slopes lie in the southern of the property along the drainage. Construction is not proposed on these slopes and this hazards will be avoided. Any cuts into the hillside should be no steeper than 3:1 unless held by engineer designed retaining walls.

Drainage Areas

A drainage bisects the site from the southeast to the northwest with a pond in the west-central portion of the site. Water was not observed in the drainage or pond at the time of this investigation, however, review of historical photographs indicate the pond typically has water. This area is indicated in the Geology/Engineering Geology Map (Figure 6) and are discussed below. Due to the size of the proposed lot this area can be avoided. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO310G dated December 7, 2018 (Figure 7, Reference 8). Exact locations of floodplain and specific drainage studies are beyond the scope of this report.

- Potentially Seasonal Shallow Groundwater Area - Constraint

Portions of the main drainage area and a minor drainage swale in the northeastern portion of the site in the northeastern portion of the site have been identified as a potentially seasonal shallow groundwater area. In these areas we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils. These area lies within defined minor drainage or and will be avoided by the proposed development. Construction in any portions of these areas, if required, or immediately adjacent to these areas should follow these precautions.

Mitigation: Foundations must have a minimum 30-inch depth for frost protection. In areas where high subsurface moisture conditions are anticipated periodically, subsurface perimeter drains are recommended to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 8. Any grading in these areas should be done to direct surface flow around construction to avoid areas of ponded water. All organic material would be completely removed prior to any fill placement. **Specific drainage studies are beyond the scope of this report.**

- Seasonal Shallow Water - Constraint

These are areas where water is ponded behind earthen dam on-site. These areas will be avoided by development. Water was not observed in the drainage or pond at the time of this investigation, however, review of historical photographs indicate the pond typically has water. The same mitigation techniques for seasonally high groundwater areas are recommended for these seasonally ponded areas as well.

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RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed development will be rural-residential utilizing water wells and individual on-site wastewater treatment systems. Two rural residential lots are proposed. The lot sizes range from 5.0-acres (Lot 1) to 8.81-acres (Lot 2). The existing house and out buildings located on Lot 2 will remain. The existing geologic and engineering geologic conditions will impose minor constraints on development and construction. The geologic constraints on the site include artificial fill, potentially expansive soils, potentially seasonal shallow groundwater, and shallow groundwater areas which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The upper granular soils encountered in the test boring on the site were encountered at medium dense to dense states, and the siltstone was encountered at hard consistencies. Siltstone bedrock was encountered at 19 feet in Test Boring No. 1. Moderate allowable bearing capacities should be expected in areas of medium dense to dense sands.

The sands encountered in the test boring are considered to have low expansion potential, however, highly expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. Mitigation of expansive soils if encountered at or near foundation grade will be required. Overexcavation and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Overexcavation depths of 3 to 4 feet are typical from the expansive soils encountered in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. These soils will not prohibit development.

The majority of the slopes in the building areas on site are gently to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. However, the steeply sloping areas along the drainage on the site have been mapped as potentially unstable slopes. These areas are along the drainage and will be avoided by future site development.

A drainage bisects the site from the southeast to the northwest with a pond in the west-central portion of the site. Water was not observed in the drainage or pond at the time of this investigation, however, review of historical photographs indicates the pond typically has water. Portions of the main drainage area and a minor drainage swale in the northeastern portion of the site in the northeastern portion of the site have been identified as a potentially seasonal shallow groundwater area, and the pond location has been identified as seasonally shallow groundwater. These areas are indicated in the Geology/Engineering Geology Map (Figure 6) and are discussed below. Due to the size of the proposed lot this area can be avoided with the proposed structure or proposed soil treatment area. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO310G dated December 7, 2018 (Figure 7, Reference 8). Exact locations of floodplain and specific drainage studies are beyond the scope of this report.

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In summary, the granular soils will likely provide suitable support for shallow foundations. The geologic conditions encountered on site can be mitigated with avoidance or proper engineering and construction practices.

ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 9), of the area of the site is not mapped with any potential aggregate resources. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 10), the site is not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 10), the area of the site has been mapped as "little or no potential" for industrial minerals.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 11), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "Poor" for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site (Reference 11).

The site has been mapped as "Fair" for oil and gas resources (Reference 11). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

EROSION CONTROL

The soil types observed on the site are mildly to highly susceptible to wind erosion, and moderately to highly susceptible to water erosion. A minor wind erosion and dust problem may be created for a short time during and immediately after construction. Should the problem be considered severe enough during this time, watering of the cut areas or the use of chemical palliative may be required to control dust. However, once construction has been completed and vegetation re-established, the potential for wind erosion should be considerably reduced.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type

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of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some minor constraints on development and construction of the site. The majority of these conditions can be avoided by construction. Others can be mitigated through proper engineering design and construction practices. The proposed development and use are consistent with anticipated geologic and engineering geologic conditions.

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Individual investigations for new building sites and septic systems will be required prior to construction. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

This report has been prepared for Paula Donohoo, for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

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We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

Respectfully Submitted,

ENTECH ENGINEERING, INC.



Logan L. Langford, P.G.
Geologist

LLL

Encl.

Entech Job No. 221954
AAprojects/2022/221954 sg&ghs

Reviewed by:



Joseph C. Goodrich, P.E.
President

Paulo Donohoo
Soil, Geology, and Geologic Hazard Study
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BIBLIOGRAPHY

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TABLES

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

CLIENT PAULA DONOHOO
PROJECT 8855 WALKER ROAD
JOB NO. 221954

SOIL TYPE	TEST BORING/ TEST PIT NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	5			19.6						SM	SAND, SILTY
1	1	2			21.9						SC	SANDY CLAY LOAM
1	2	4			9.7						SM-SW	GRAVELLY SANDY LOAM
2	1	20			59.7						ML	SILTSTONE, VERY SANDY

Table 2: Summary Test Boring Results

Test Boring No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.)
1	19	>20

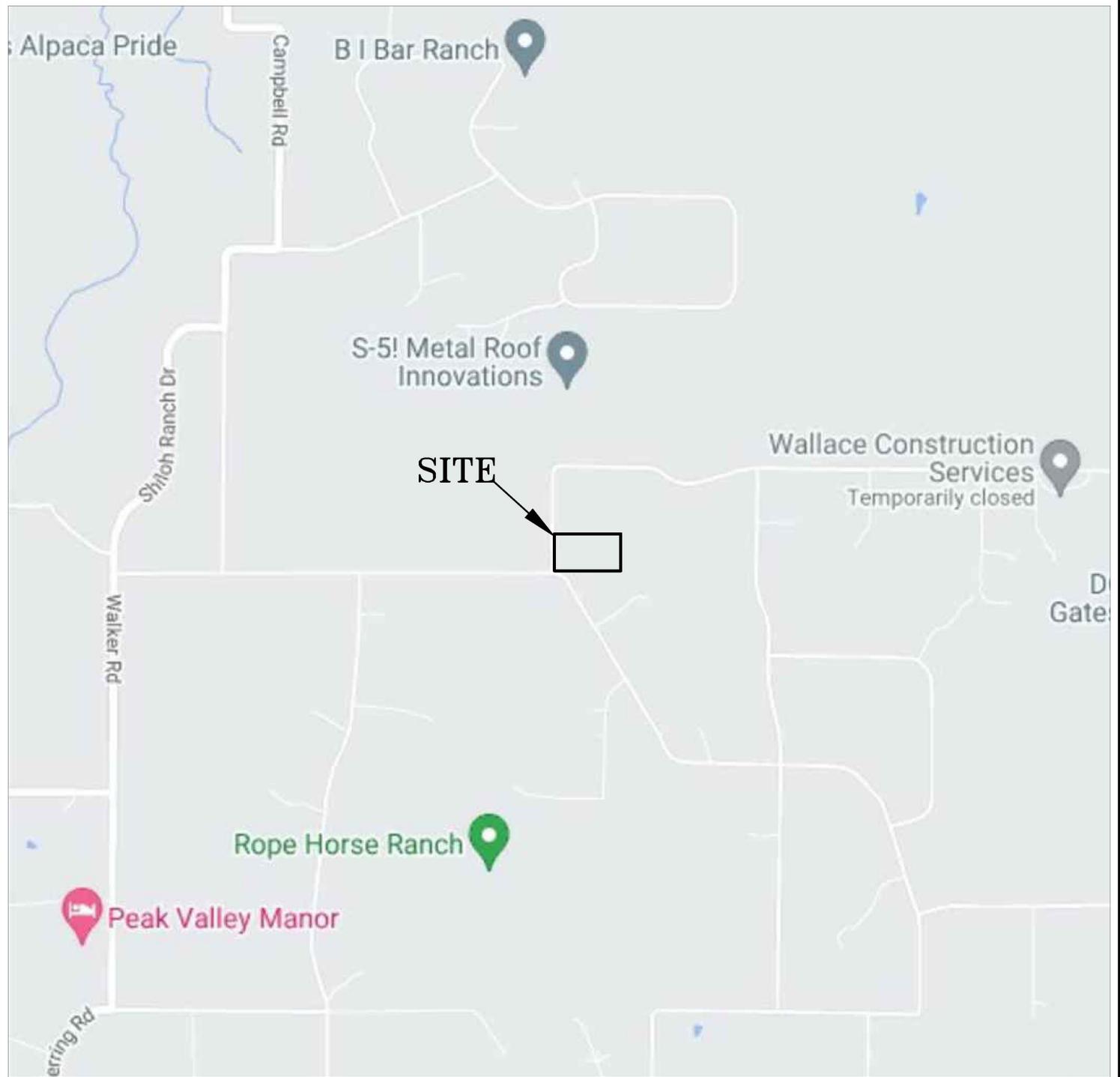
Table 3: Summary Test Pit Results

Test Pit No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.)	USDA Soil Type	LTAR Value
1	>8	>8	3A*	0.30*
2	>8	>3**	R-1*	0.50*

*- Conditions that will require an engineered OWTS

** -Signs of seasonally occurring groundwater

FIGURES

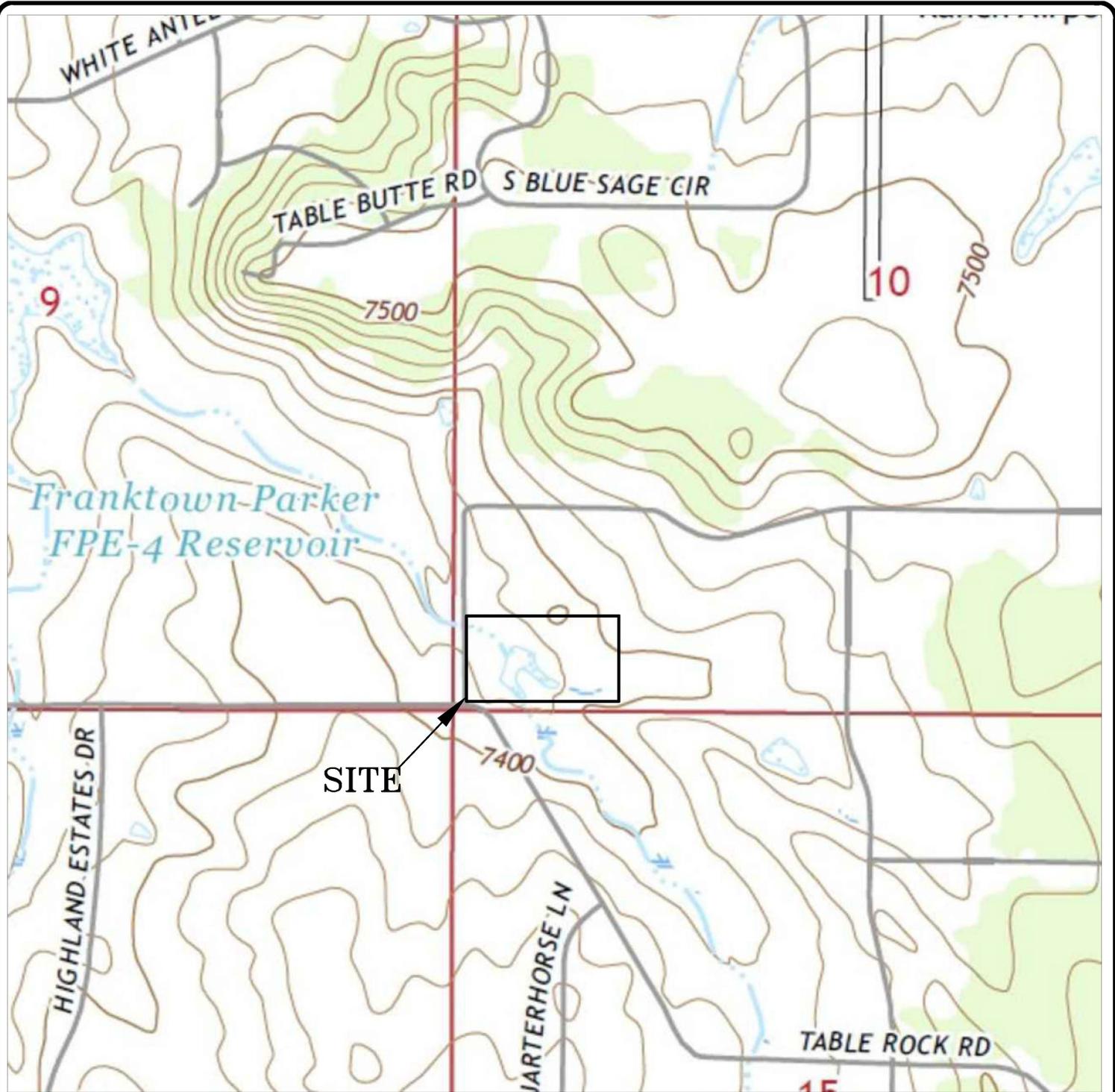


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VICINITY MAP
 HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
 8855 WALKER ROAD
 EL PASO COUNTY, CO.
 FOR: PAULA DONOHOO

DRAWN: LLL	DATE: 10/24/22	CHECKED:	DATE:
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JOB NO.:
 221954
 FIG NO.:
 1



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USGS TOPOGRAPHY MAP
 HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
 8855 WALKER ROAD
 EL PASO COUNTY, CO.
 FOR: PAULA DONOHOO

DRAWN:
 LLL

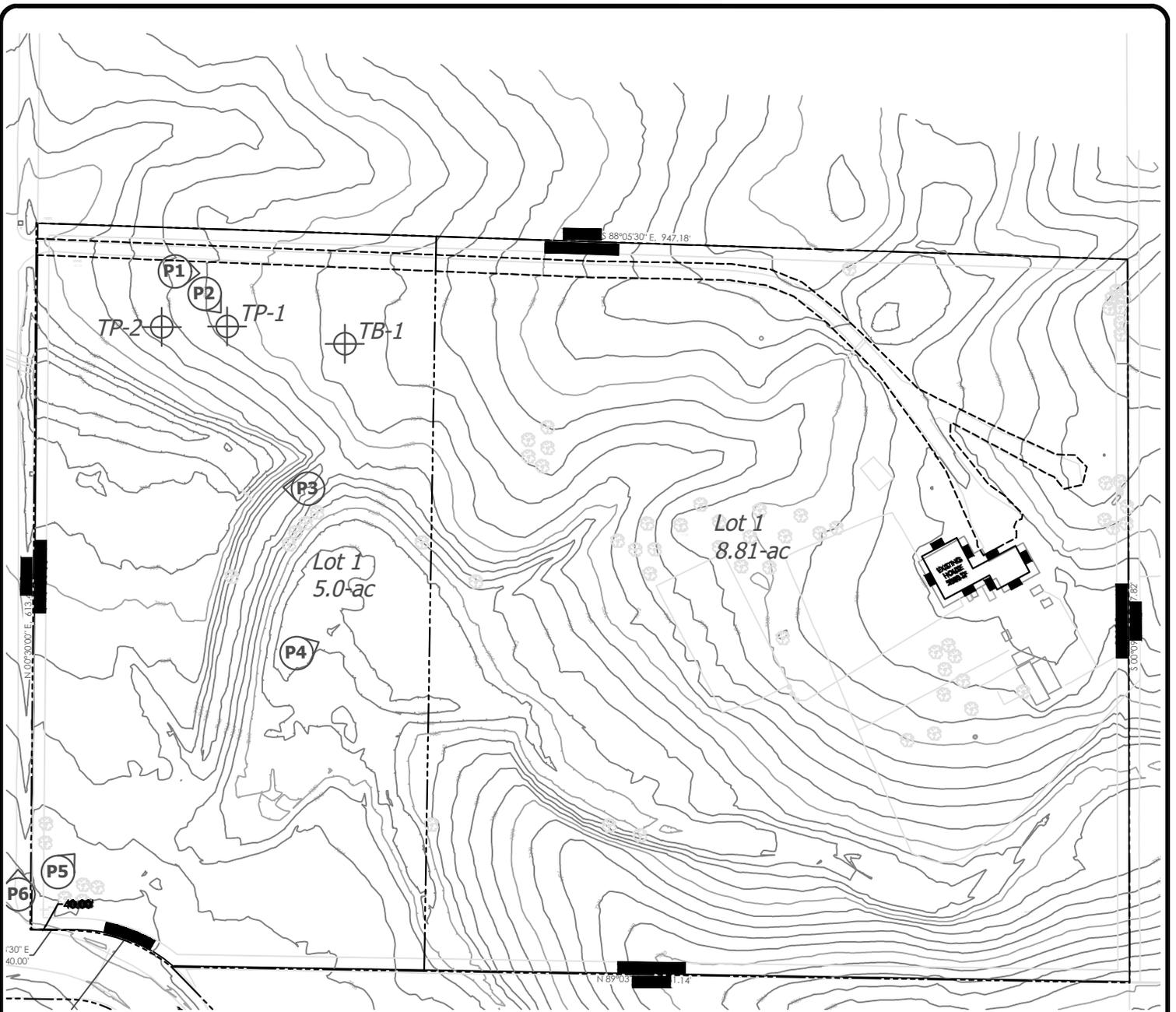
DATE:
 10/24/22

CHECKED:

DATE:

JOB NO.:
 221954

FIG NO.:
 2



⊕ TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

Ⓟ - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER



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SITE PLAN/TESTING LOCATION MAP
HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
8855 WALKER ROAD
EL PASO COUNTY, CO.
FOR: PAULA DONOHOO

DRAWN:
LLL

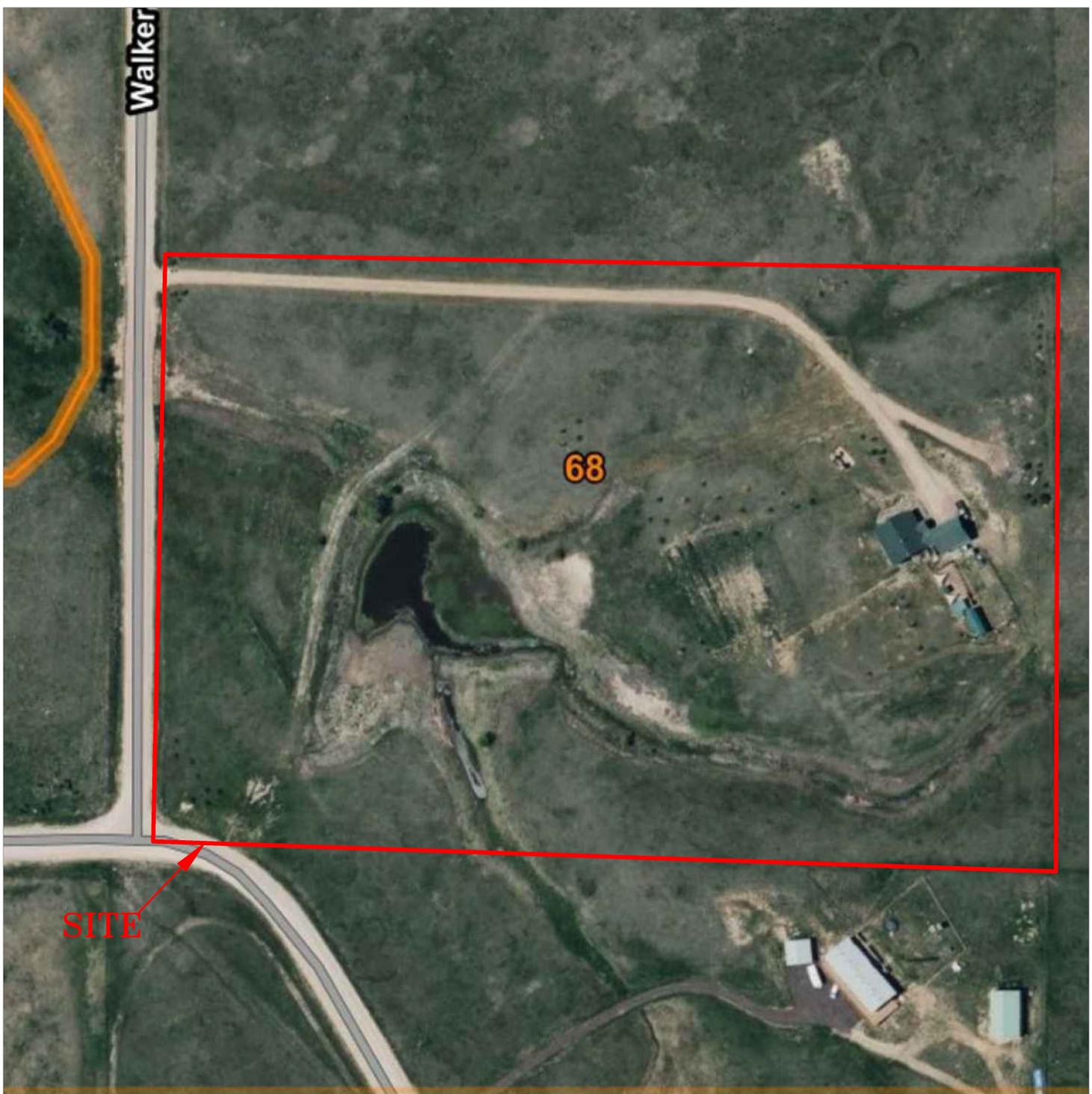
DATE:
10/24/22

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DATE:

JOB NO.:
221954

FIG NO.:
3



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505 ELKTON DRIVE
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SOIL SURVEY MAP
HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
8855 WALKER ROAD
EL PASO COUNTY, CO.
FOR: PAULA DONOHOO

DRAWN:
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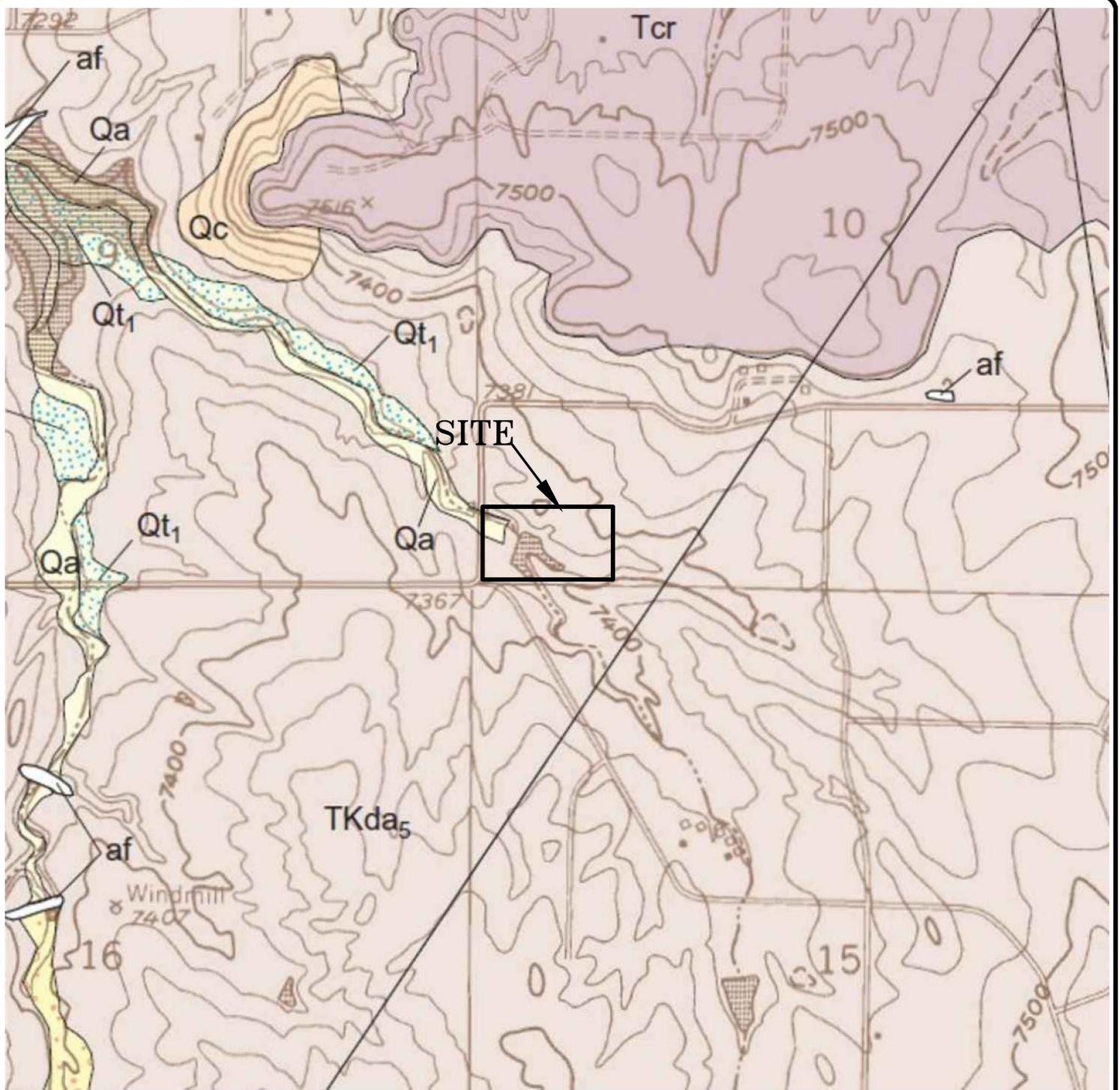
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10/24/22

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DATE:

JOB NO.:
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FIG NO.:
4



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 COLORADO SPRINGS, CO. 80907 (719) 531-5599

BLACK FOREST QUADRANGLE GEOLOGIC MAP
HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
 8855 WALKER ROAD
 EL PASO COUNTY, CO.
 FOR: PAULA DONOHOO

DRAWN:
 LLL

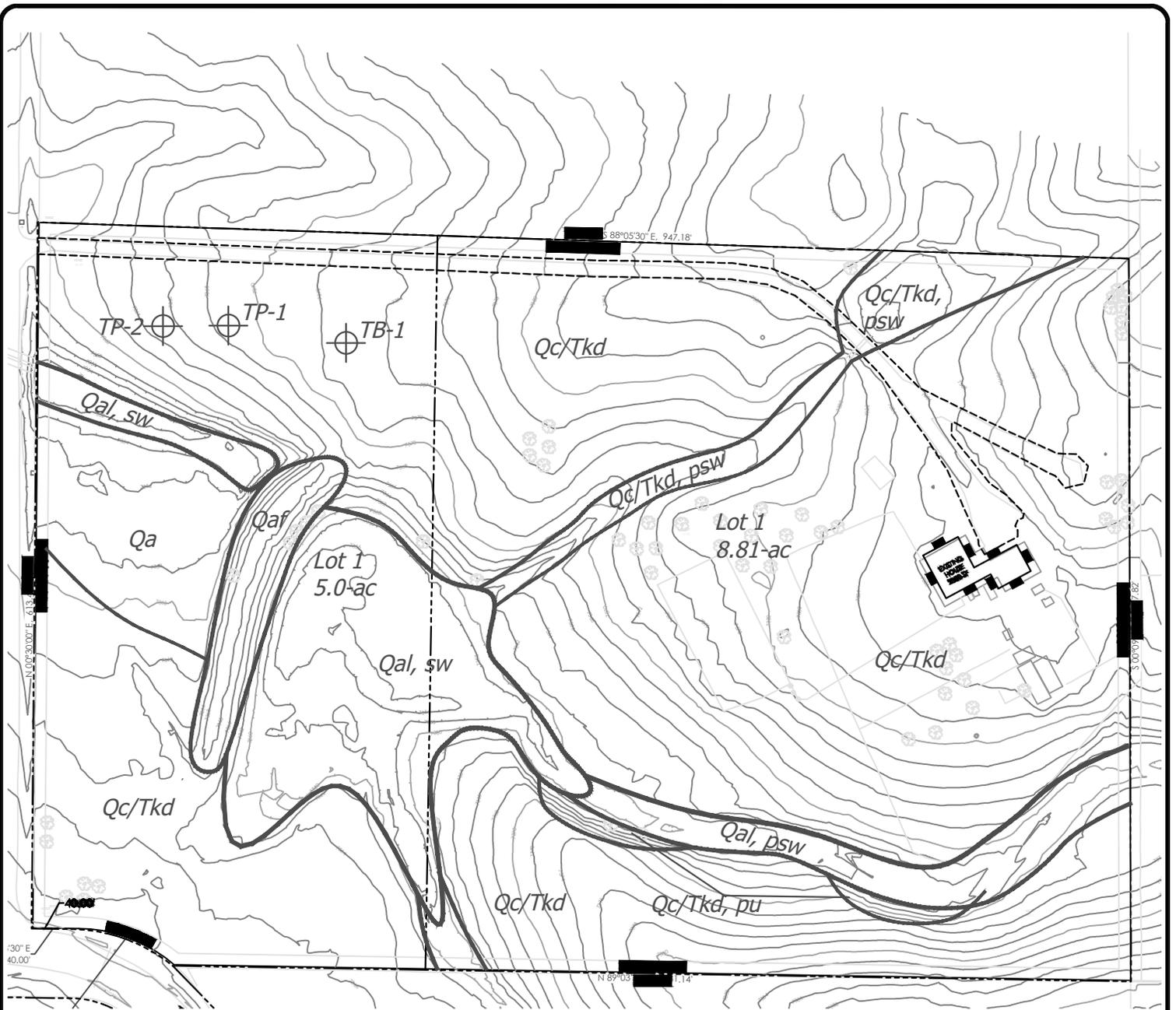
DATE:
 10/24/22

CHECKED:

DATE:

JOB NO.:
 221954

FIG NO.:
 5



Legend:

- Qal - Alluvium of Holocene Age:
recent water deposited materials along drainage channels
- Qaf - Artificial Fill of Holocene Age
man-made fill deposits associated with fill along the pipeline easement
- Qa - Channel and Floodplain Alluvium of Late Holocene Age:
low terrace deposits flanking active drainage channels
- Qc/Tkd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone
- pu - potentially unstable slopes
- psw - potentially shallow groundwater area
- sw - seasonal shallow/ponded groundwater



**ENTECH
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505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

**GEOLOGY/ENGINEERING GEOLOGY MAP
HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
8855 WALKER ROAD
EL PASO COUNTY, CO.
FOR: PAULA DONOHOO**

DRAWN: LLL	DATE: 10/24/22	CHECKED:	DATE:
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JOB NO.:
221954

FIG NO.:
6



SITE

300ft



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ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

FEMA FLOODPLAIN MAP
HIGH FOREST ESTATES SUBDIVISION FIL. NO 1
8855 WALKER ROAD
EL PASO COUNTY, CO.
FOR: PAULA DONOHOO

DRAWN:
LLL

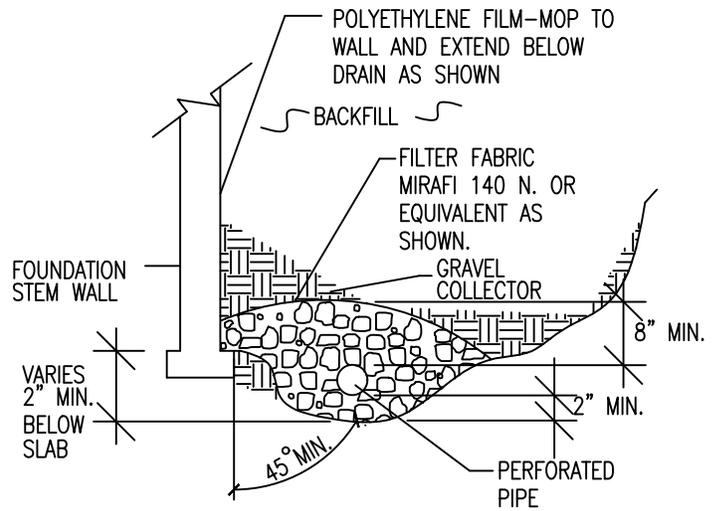
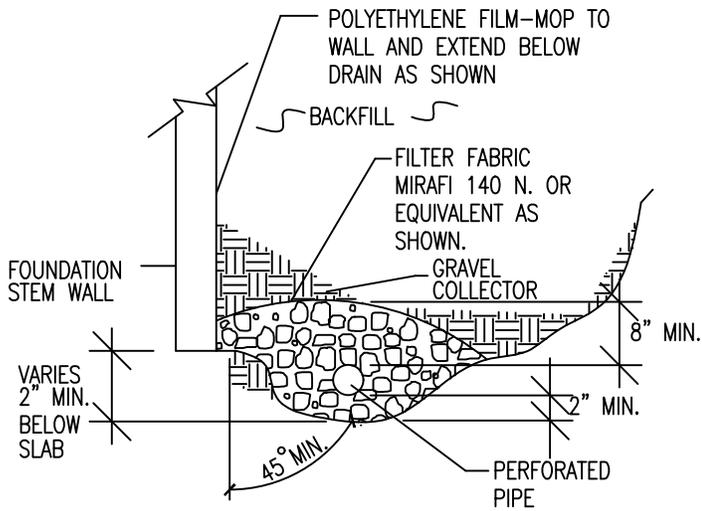
DATE:
10/24/22

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DATE:

JOB NO.:
221954

FIG NO.:
7



NOTES:

-GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS-85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

-PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4-INCH DIAMETER IS MOST OFTEN USED.

-ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON-PERFORATED PIPE.

-FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

-MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

-DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUTFALL IS NOT AVAILABLE.



ENTECH
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 505 ELKTON DRIVE
 COLORADO SPRINGS, CO. 80907 (719) 531-5599

PERIMETER DRAIN DETAIL

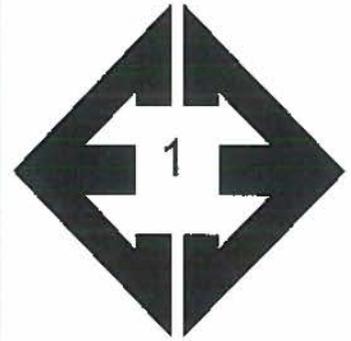
DRAWN:	DATE:	DESIGNED:	CHECKED:
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JOB NO.:
 221954

FIG NO.:

8

APPENDIX A: Photographs



**Looking east from the
northwestern portion
of the site.**

September 21, 2022



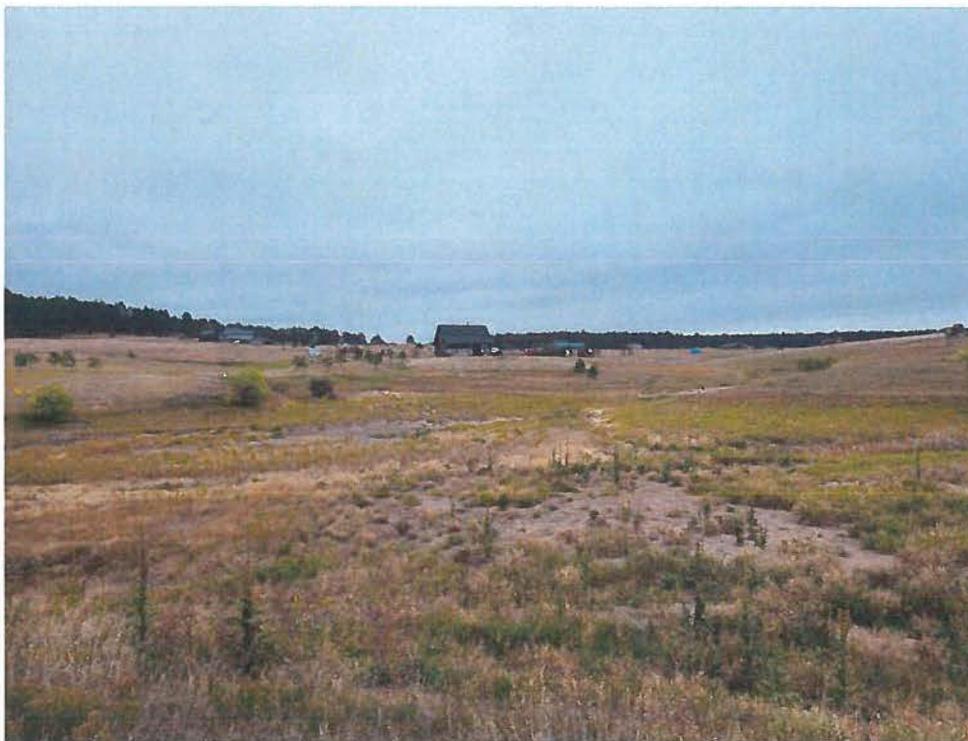
**Looking southeast
from the northwestern
portion of the site.**

September 21, 2022



Looking west from earthen dam along drainage towards Walker Road.

September 21, 2022



Looking east from the pond in the western portion of the site.

September 21, 2022



**Looking northeast
from the southwest
portion of the site.**

September 21, 2022



**Looking north from the
southwestern portion
of the site.**

September 21, 2022

APPENDIX B: Test Boring & Test Pit Logs

TEST BORING NO. 1
 DATE DRILLED 9/28/2022
 Job # 221954

TEST BORING NO.
 DATE DRILLED
 CLIENT PAULA DONOHOO
 LOCATION 8855 WALKER ROAD

REMARKS

REMARKS

DRY TO 19.5', 9/29/22

SAND, SILTY, FINE TO COARSE
 GRAINED, TAN, MEDIUM DENSE
 TO VERY DENSE, DRY TO MOIST

SILTSTONE, VERY SANDY, TAN,
 HARD, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			25	3.0	1	5					
			50*	2.5	1						
			11"								
10			22	7.0	1	10					
15			42	9.0	1	15					
20			50	11.9	2	20					
			9"								

*-HIGHER BLOW COUNTS DUE TO GRAVEL



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505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	10/7/22

JOB NO.:
 221954

FIG NO.:
 B- 1

TEST PIT NO. 1
 DATE EXCAVATED 9/29/2022
 Job # 221954

TEST PIT NO. 2
 DATE EXCAVATED 9/29/2022
 CLIENT PAULA DONOHOO
 LOCATION 8855 WALKER ROAD

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil (0-8 inches)							redox @ 3-feet 0-inches						
sandy clay loam, fine to coarse grained, brown, moist	1			ma		3A	topsoil (0-12 inches)	1			ma		3A
	2						sandy clay, fine to medium grained, brown, moist	2					
	3							3					
	4						gravelly sandy loam, fine to very coarse grained, brown, moist	4			gr	m	R-1
	5			ma		3A		5					
	6							6					
	7							7					
	8							8					
	9							9					
	10							10					

Soil Structure Shape

- granular - gr
- platy - pl
- blocky - bl
- prismatic - pr
- single grain - sg
- massive - ma

Soil Structure Grade

- weak - w
- moderate - m
- strong - s
- loose - l



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505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

DRAWN:
jhr

DATE:
10/3/22

CHECKED:
L.L.L.

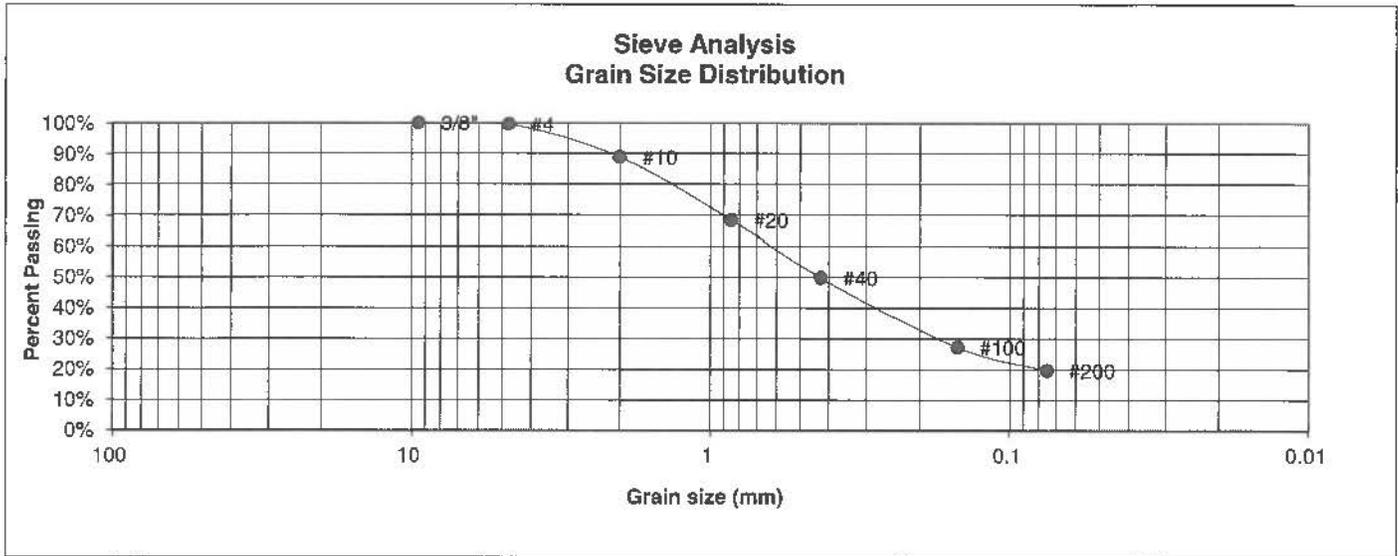
DATE:
10/7/22

JOB NO.:
221954

FIG NO.:
B-2

APPENDIX C: Laboratory Test Results

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	PAULA DONOHOO
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	8855 WALKER ROAD
<u>TEST BORING #</u>	1	<u>JOB NO.</u>	221954
<u>DEPTH (FT)</u>	5	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.6%
10	88.8%
20	68.3%
40	49.8%
100	27.2%
200	19.6%

Atterberg Limits
 Plastic Limit
 Liquid Limit
 Plastic Index

Swell
 Moisture at start
 Moisture at finish
 Moisture increase
 Initial dry density (pcf)
 Swell (psf)



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

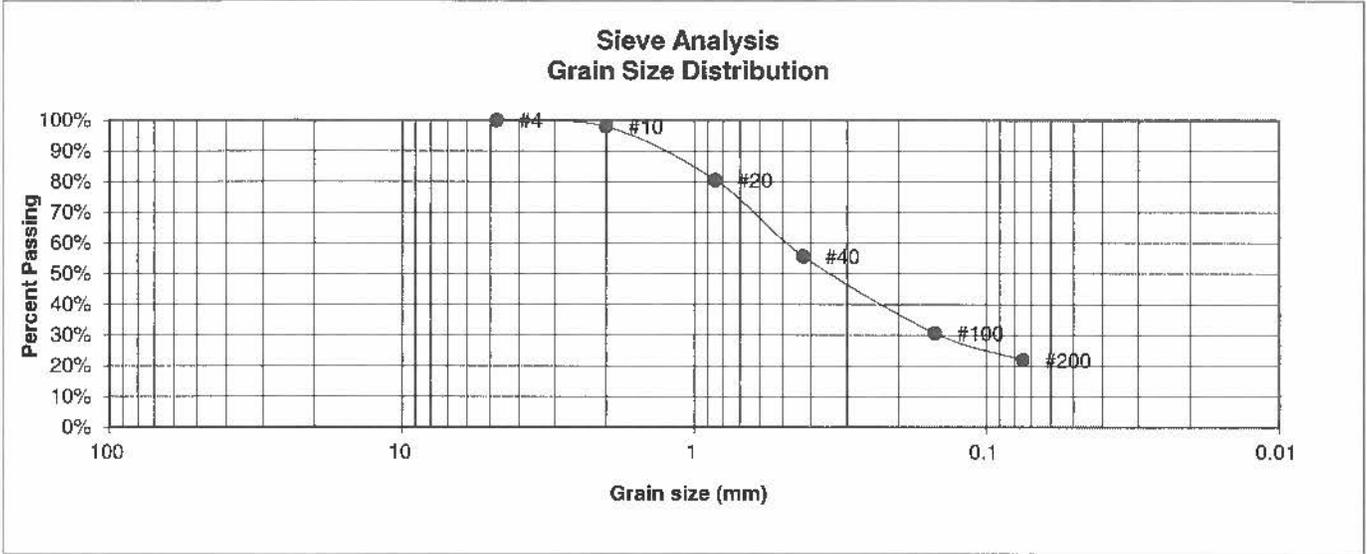
**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LLL	<u>DATE:</u> 10/7/22
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JOB NO.:
221954

FIG NO.:
C-1

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SC	TEST BY	BL
DEPTH(ft)	2	AASHTO CLASSIFICATION		JOB NO.	221954
CLIENT	PAULA DONOHOO				
PROJECT	8855 WALKER ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	97.9%
20	80.5%
40	55.7%
100	30.7%
200	21.9%

Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:

DATE:

CHECKED:

DATE:

LLL

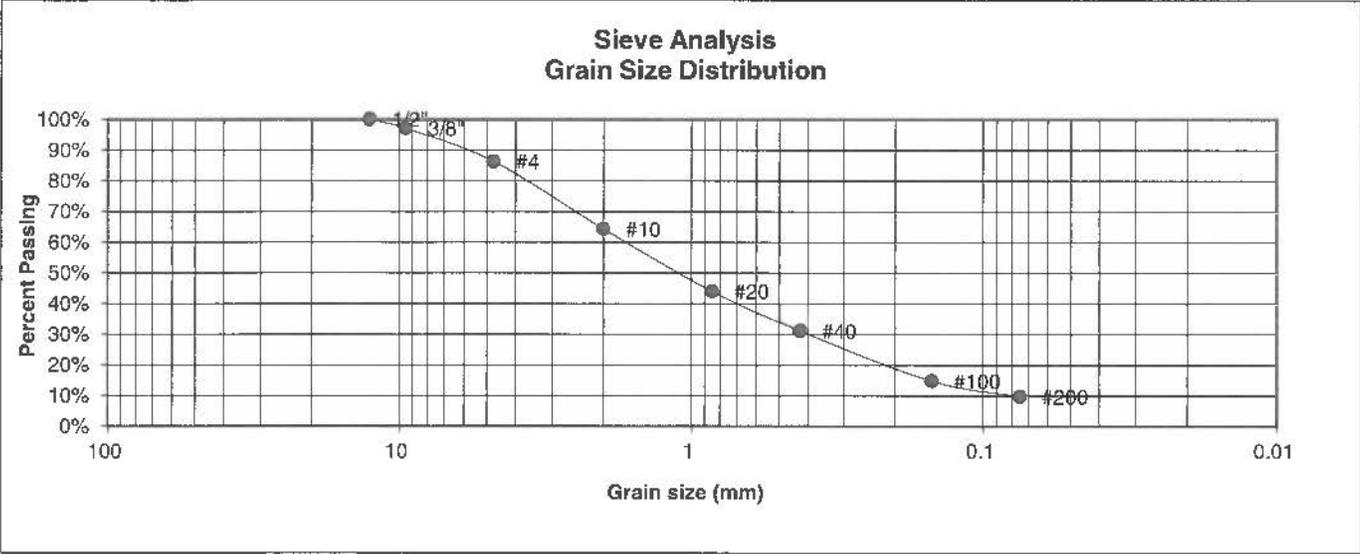
10/7/22

JOB NO.:
221954

FIG NO.:

C-2

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	4	AASHTO CLASSIFICATION		JOB NO.	221954
CLIENT	PAULA DONOHO				
PROJECT	8855 WALKER ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.1%
4	86.4%
10	64.3%
20	44.1%
40	31.1%
100	14.8%
200	9.7%

Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)



**ENTECH
ENGINEERING, INC.**

505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST
RESULTS**

DRAWN:

DATE:

CHECKED:

DATE:

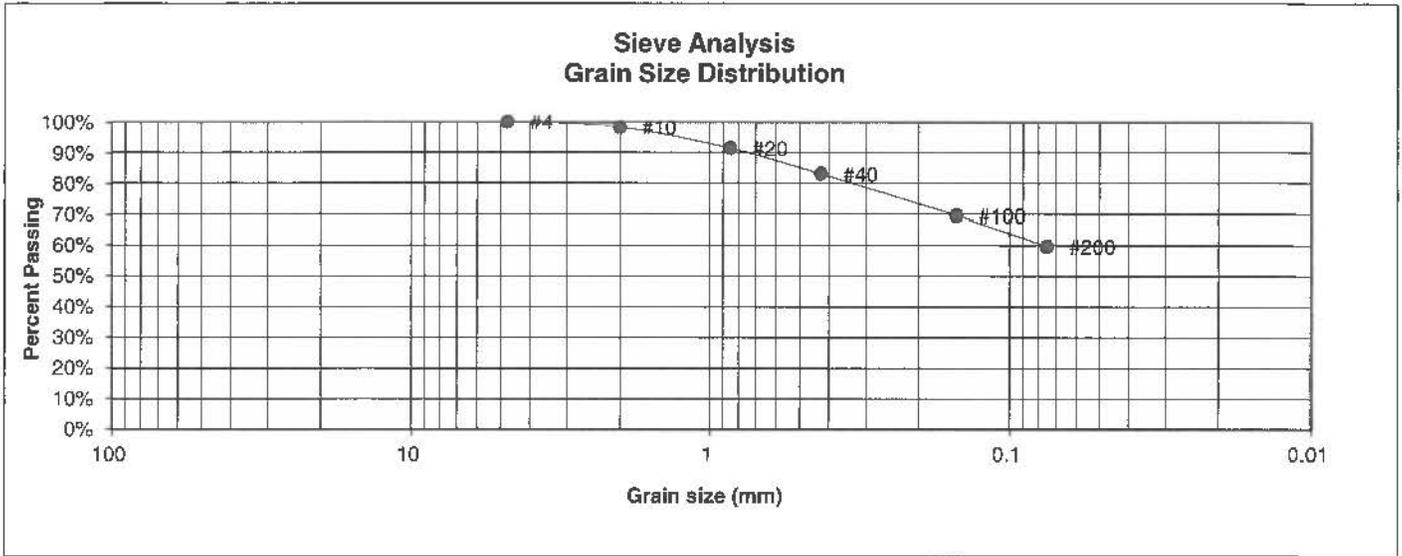
LLL

10/7/22

JOB NO.:
221954

FIG NO.:
C-3

<u>UNIFIED CLASSIFICATION</u>	ML	<u>CLIENT</u>	PAULA DONOHOO
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	8855 WALKER ROAD
<u>TEST BORING #</u>	1	<u>JOB NO.</u>	221954
<u>DEPTH (FT)</u>	20	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.3%
20	91.3%
40	83.0%
100	69.6%
200	59.7%

Atterberg Limits
 Plastic Limit
 Liquid Limit
 Plastic Index

Swell
 Moisture at start
 Moisture at finish
 Moisture increase
 Initial dry density (pcf)
 Swell (psf)



**ENTECH
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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LRL	<u>DATE:</u> 10/7/22
---------------	--------------	------------------------	-------------------------

JOB NO.:
221954

FIG NO.:
C-4

**APPENDIX D: Front Range Geotechnical, Inc., Soils Report, 8855
Walker Road, El Paso County, CO, Job No. 6461**



P.O. Box 1351
Monument, CO 80132
719 481-4560
Fax 481-9204

**SOILS REPORT
FOR
MARY BRISCOE**

JOB #6461

Lot 1, Block 7,
Willow Springs Estates Subdivision,
8855 Walker Road,
El Paso County,
Colorado

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jeff Houchin", written over a horizontal line.

Jeff Houchin
Geologist



Paul R. Bryant, P.E.
Civil Engineer

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CONCLUSIONS	1
GENERAL	1
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MINIMUM MATERIALS SPECIFICATIONS	4
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PERIMETER DRAIN SKETCH	8
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INTRODUCTION

Homeowners must be made aware of the contents of this report. This is to insure that the recommendations and requirements of the report, especially regarding the surface drainage, are acknowledged and followed. This report is prepared for **Mary Briscoe, purchaser/owner of Lot 1, Block 7, Willow Springs Estate Subdivision, 8855 Walker Road, El Paso County, Colorado.** It is my understanding that a single family residence is planned for this site. The site is currently vacant.

CONCLUSIONS

A satisfactory foundation for this structure is a properly designed shallow foundation system consisting of foundation components resting directly on undisturbed materials. Foundation components resting directly on undisturbed materials shall be designed for a loading of not greater than **1500 pounds per square foot.** The compressibility of this material is low. This bearing capacity is calculated with a safety factor of three. The type of foundation configuration used depends on the building loads applied. The minimum depth for foundation walls shall be 30 inches for frost protection. The laboratory testing revealed that the on-site soil is silty sand (U.S.C. Classification Symbol SM). The unit weight of equivalent fluid soil pressure of this material is **40 pounds per cubic foot.** **The owners shall be made aware that movement will occur if surface or subsurface water is allowed to collect around the foundation wall.**

GENERAL

The investigation was made to reveal important characteristics of the soils and of the site influencing the foundation design. Also evaluated during the investigation were subsurface conditions which affect the depth of the foundation and subsequent loading design, such as ground water levels, soil types, and other factors which affect the bearing capacity of the soils. Design loadings are based on soils characteristics and represent the maximum permissible loads for these conditions.

FIELD AND LABORATORY INVESTIGATION

Two exploratory holes were drilled on May 5, 1999, at the locations shown on the enclosed site map. The location of these test holes was determined by Mary Briscoe. The test holes were drilled with a 3" diameter auger. At intervals anticipated to be the foundation depths, and as determined by the soils conditions, the drill tools were removed and samples were taken by the use of a 2-inch split barrel sampler connected to a 140 pound drop-hammer. This hammer is dropped 30" to drive the penetration sampler into the soil (ASTM D-1586). The depths and descriptions of the materials encountered in each test boring at which the samples were taken are shown on the enclosed log sheets. All samples were classified both in the field and in the laboratory to evaluate the physical and mechanical properties of the materials encountered.

TOPOGRAPHY

The topography of this site is that of an incline sloping down towards the southwest at 6%.

WEATHER

The weather at the time of the soil examination consisted of mostly cloudy skies, with cool temperatures.

DESIGN AND CONSTRUCTION CONSIDERATIONS

The materials encountered during the exploratory testing are suitable for the support of residential construction. If compaction is not performed, settlement may occur causing cracking of foundation walls and floors. Soil located beneath concrete walls and floors shall be compacted to at least 95% Modified Proctor density. Special care is to be taken to recompact the material above utility lines to a minimum of 85% Modified Proctor density. During construction, conditions which could cause settlement shall be eliminated. Interior non-bearing partition walls **shall be free-floating** or independent from the concrete floor slab. The following are general recommendations of on-grade slabs:

1. Slabs shall be placed on well-compacted, non-expansive materials, and all soft spots shall be thoroughly excavated and replaced with non-expansive fill materials as stated above.
2. Separate the slab from all foundation walls, load bearing members, and utility lines.
3. At intervals not to exceed 12 feet in each direction, provide control joints to prevent possible cracking of the slab.
4. Moisten the ground beneath the slab prior to placement of concrete.
5. All concrete placed must be cured properly and be segregated by control joints and with separation of load bearing members from slabs, as discussed above. Care must be exercised to prevent excess moisture from entering the soil under the structure, both during and after construction.
6. The soil has been analyzed for its expansion potential. Basement slabs, garage slabs, and all concrete floor slabs, however, exert a very low dead-load pressure on the soil. Since this soil contains at least a small amount of expansion potential, slabs will crack and heave if excess water is allowed to penetrate the subgrade. For example, column openings to pads below the placed slab, if exposed to precipitation during construction, will conduct water to the subgrade, possibly causing it to expand. Also, if the slab is placed with concrete too wet, expansion may occur. We recommend 3000 psi concrete placed at a maximum slump of 4".

COLD TEMPERATURE CONSIDERATIONS

1. Concrete shall not be placed upon frozen soil.
2. Concrete shall be protected from freezing until it has been allowed to cure for at least 7 days after placement in forms.
3. Snow or other frozen water shall not be allowed in the forms during placement of concrete.
4. Concrete shall be cured in forms for at least 72 hours.
5. The site shall be kept well drained at all times.

SURFACE DRAINAGE

After construction of foundation walls, the backfill material shall be well compacted of 80% modified Proctor density, to prevent future settlement. Any areas which settle after construction shall be filled to eliminate ponding of water adjacent to the foundation walls. The finished grade shall have a positive slope away from the structure with an initial slope of 6" in the first 10'. All downspouts shall have splash blocks which will remove runoff to outside the foundation area. Likewise, sprinkler systems shall not be installed adjacent to the structure, but rather shrubs and plants requiring minimal watering shall be established in this area.

SUBSURFACE DRAINAGE

The necessity for perimeter drains will be determined at the time of the open hole observation.

REINFORCING

The concrete foundation walls shall be properly reinforced as per the specific design for this foundation by a Professional Engineer. **Exact requirements are a function of the design of the structure. Questions concerning the specific design requirements shall be referred to the design engineer.**

FOOTING DESIGN

The design for footings for this structure is determined by applying the dead load and full live load to the foundation walls.

CONSTRUCTION DETAILS

It is necessary with any soils investigation to assume that the materials from the test holes are representative of the materials in the area. On occasion variations in the subsurface materials do occur, therefore, should such variations become apparent during construction, the owner is advised to contact this office for a determination as to whether these variations will affect the design of the structure's foundation. If clay layers are observed during the excavation for the dwelling, this office should be contacted to determine whether the layers will adversely affect the design.

MINIMUM MATERIALS SPECIFICATIONS

1. Minimum materials specifications of the concrete, reinforcing, etc., shall be determined by the Professional Engineer.
2. Compact beneath foundation walls a minimum of 95% modified Proctor density to prevent settlement.
3. Compact all backfill material located around the perimeter of the foundation to a minimum of 80% modified Proctor density.
4. Concrete shall be vibrated or rodded in forms to avoid segregation and cold joints.
5. The site shall be kept well drained at all times.

OPEN HOLE OBSERVATION

The owner, or a representative of the construction company, shall contact **Front Range Geotechnical, Inc.** 24 hours prior to digging of the foundation. An open hole observation must be performed prior to the placement of concrete, and preferably prior to the placement of forms in the excavated area. This is to insure that soft areas, anomalies, etc., are not present in the foundation region. At the time of the open hole observation the maximum allowable bearing capacity may be revised according to soil conditions found at that time.



**FRONT RANGE
GEOTECHNICAL
INC.**

DRILL LOGS

JOB#: 6461

TEST BORING
NO.: TH-1

DATE: 5/5/1999

DEPTH (in ft.)	SYMBOL	SAMPLES	BLOW COUNT	WATER %	SOIL TYPE
0-6"					
6"-15'					
13'			14 12"	11.8	SM
13'			12 12"	18.3	SM

0-6" TOPSOIL
6"-15' SAND
fine grained
moderate density
moderate-high moisture
content, increasing
to high moisture
content at 13 feet
depth
low clay content
low plasticity
tan in color

JOB#: 6461

TEST BORING
NO.: TH-2

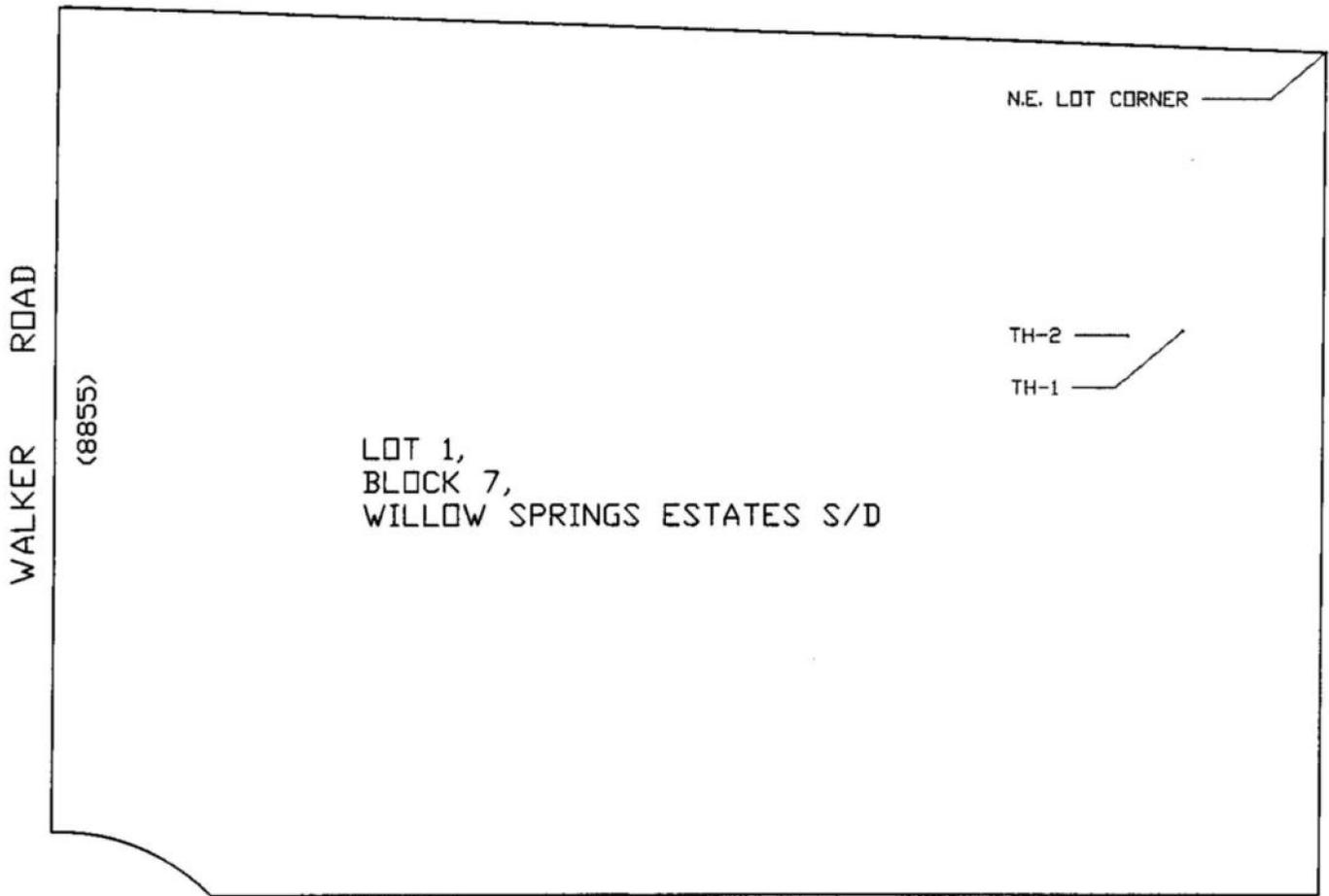
DATE: 5/5/1999

DEPTH (in ft.)	SYMBOL	SAMPLES	BLOW COUNT	WATER %	SOIL TYPE
0-6"					
6"-15'					
13'			12 12"	9.4	
13'			12 12"	11.6	

0-6" TOPSOIL
6"-15' SAND
fine grained
moderate density
moderate-high moisture
content, increasing
to moderate-high
moisture content at
13 feet depth
low clay content
low plasticity
tan in color

Site Map

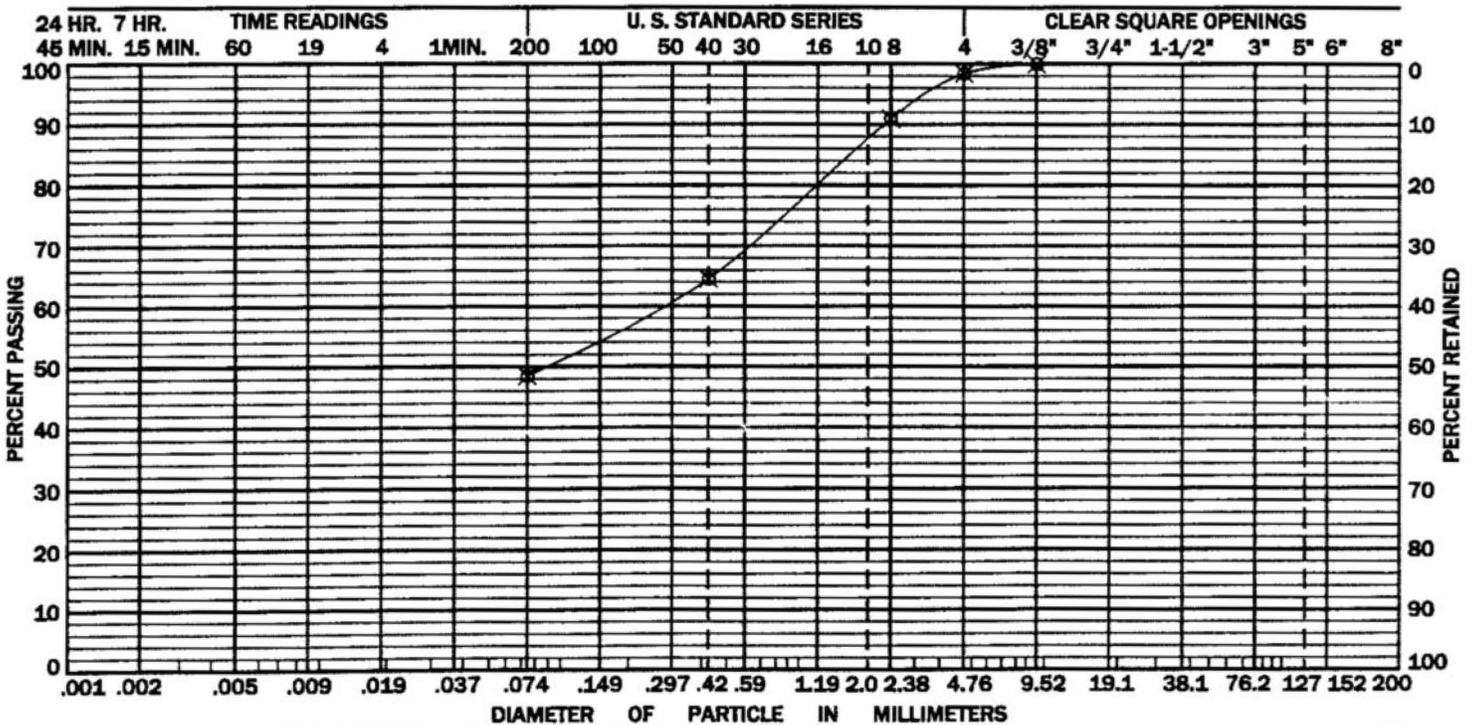
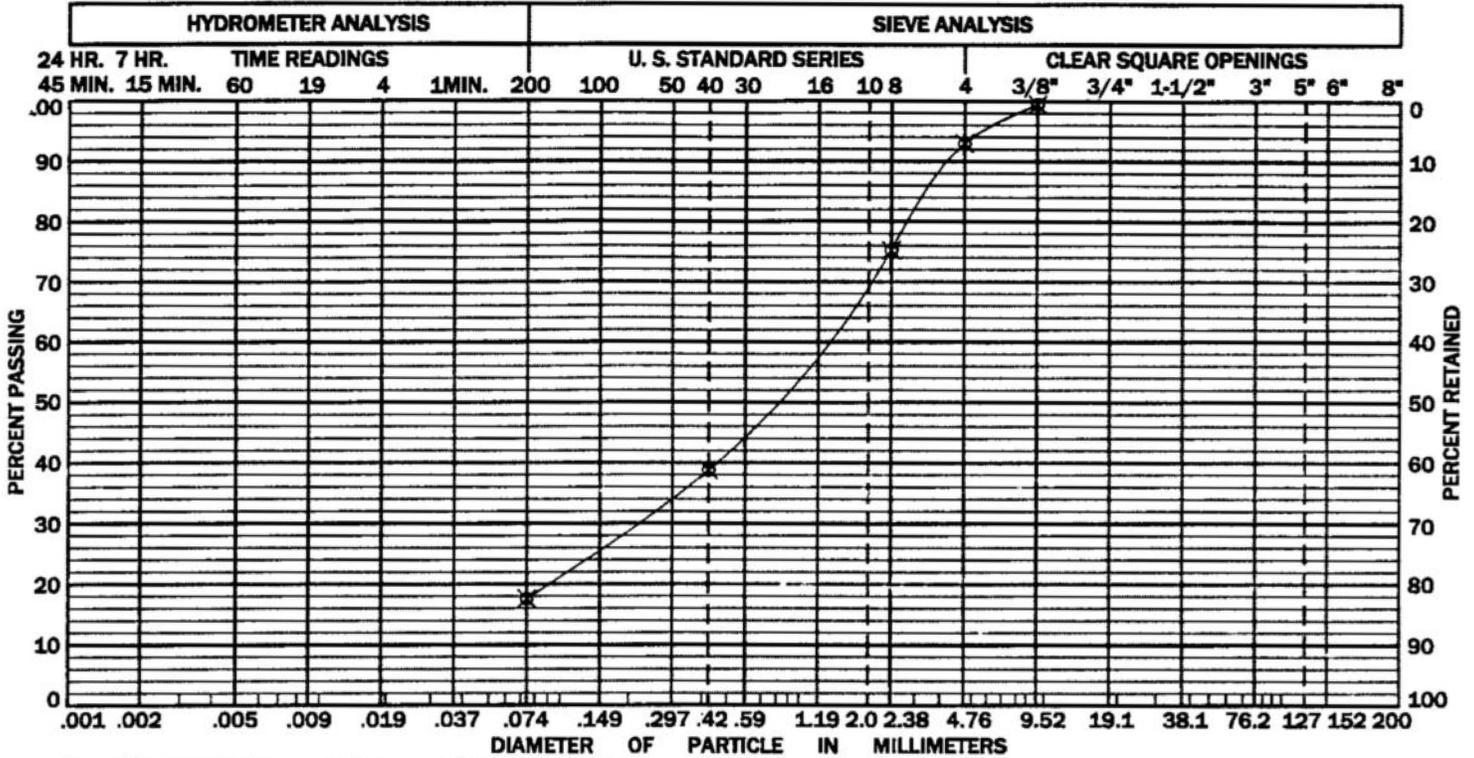
Lot 1, Block 7,
Willow Springs Estates Subdivision,
8855 Walker Road,
El Paso County, Colorado

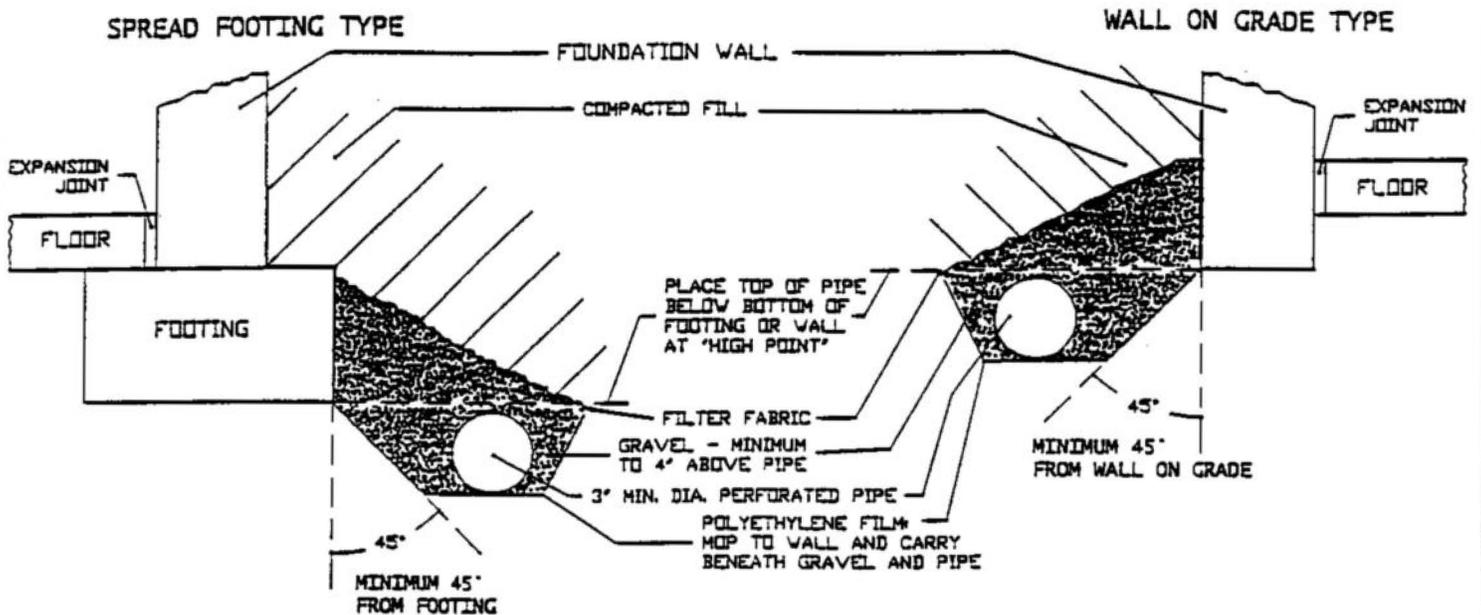




FRONT RANGE GEOTECHNICAL INC.

GRADATION TEST RESULTS





1. Gravel size shall not be less than 1/2" in diameter and not greater than 1-1/2" in diameter.
2. Diameter of perforated pipe varies with amount of seepage expected, three inch diameter is most common.
3. Pipe shall be laid at a minimum grade of 1" in 10'.
4. Outfall to be unobstructed, gravity outfall if possible. Use sump and pump only if gravity outfall does not exist. Discharge portion of pipe shall be non perforated past area to be drained. Owner is responsible to maintain daylighting of drain.
5. Exterior earth backfill material should be compacted to at least 30% maximum modified proctor density in the upper three feet of fill.
6. Filter fabric shall be mirafi 140 s or equivalent.
7. Drain pipe shall be laid below area serviced or protected, as shown in the detail above.
8. Mop polyethylene film to wall and carry beneath gravel and pipe.
9. The polyethylene film shall be continued to the edge of the excavation.

LIMITATIONS

This report is issued based on the understanding that the owner or his representative will bring the information, data, and recommendations contained in this report to the attention of the project engineer and architect, in order that they may be incorporated into the plans for the structure. It is also the owner's responsibility to ensure that all contractors and sub-contractors carry out these recommendations during the construction phase.

This report was prepared in accordance with generally accepted professional geotechnical/engineering methods. However, **Front Range Geotechnical, Inc.** makes no other warranty, express or implied, as to the findings, data, specifications, or professional advice rendered hereunder.

This report is considered valid as of the present date. The owner acknowledges, however, that changes in the conditions of the property might occur with the passage of time, such as those caused by natural effects or man-made changes, both on this land and on abutting properties. Further, changes in acceptable tolerances or standards might arise as the result of new legislative actions, new engineering advances, or the broadening of geotechnical knowledge. Thus certain developments beyond our control may invalidate this report, in whole or in part.

This report and its recommendations do not apply to any other site than the one described herein and are predicated on the assumption that the soil conditions do not deviate from those described. In the event that any variations or undesirable conditions should be detected during the construction phase of if the proposed construction varies from that planned as of this report date, the owner shall immediately notify **Front Range Geotechnical, Inc.** in order that supplemental recommendations can be provided, if so required.

APPENDIX E: Soil Survey Descriptions

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 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

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 supply, 0 to 60 inches: 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 - Loamy Park

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

Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 20, Sep 2, 2022

APPENDIX F: El Paso County Health Department Septic Records



Prevent • Promote • Protect

Environmental Health Division

1675 W. Garden of the Gods Rd., Suite 2044
Colorado Springs, CO 80907
(719) 578-3199 phone
(719) 575-8664 fax
www.elpasocountyhealth.org

**ENGINEERED ON-SITE WASTEWATER TREATMENT SYSTEM
FINAL INSPECTION FORM**



On-site ID: ON0034428 Tax schedule (APN) #: 5110001009 Permit Type: New Major Minor
Environmental Health Specialist: Neil Mayes Final Inspection Date: 2/14/2018 Approved: YES NO

Residential Property Information:

Owner: Neal Eby Address: 8855 Walker Rd, Colorado Springs, CO 80908 Approved No. Bedrooms: 4
Water supply: Municipal Well Cistern Date well installation verified: 2/14/2018 GPS of Well: 39°06.097'N 104°39.610'W
Approval will be revoked if in the future any well is found to be within 50 feet of the septic tank and/or 100 feet of the soil treatment area.

Minimum System Requirements: Soil Type: 4A LTAR: 0.15 Limiting Layer: Groundwater 7' Bedrock

OWTS Tank: Capacity (gallons): 1250
Soil Treatment Area (STA): Sq. Ft. (10-1): 3500 Sq. Ft. (10-2): 2800 Sq. Ft. (10-3): 1960 Sq. Ft. (with Diverter Valve): (10-2)/(2)
NDDS (STA): Sq. Ft. (10-1): NDDS Factor: Sq. Ft. (NDDS adjustment):

Engineering:

Design Engineer: Parr Engineering & Consulting, Inc Engineer design #: 17.579
Date engineer record drawing/certification letter received: 4/8/2019

Final system installation:

Licenses Installer: Tier 2: **Installer:** Peak Excavating & Septic, LLC

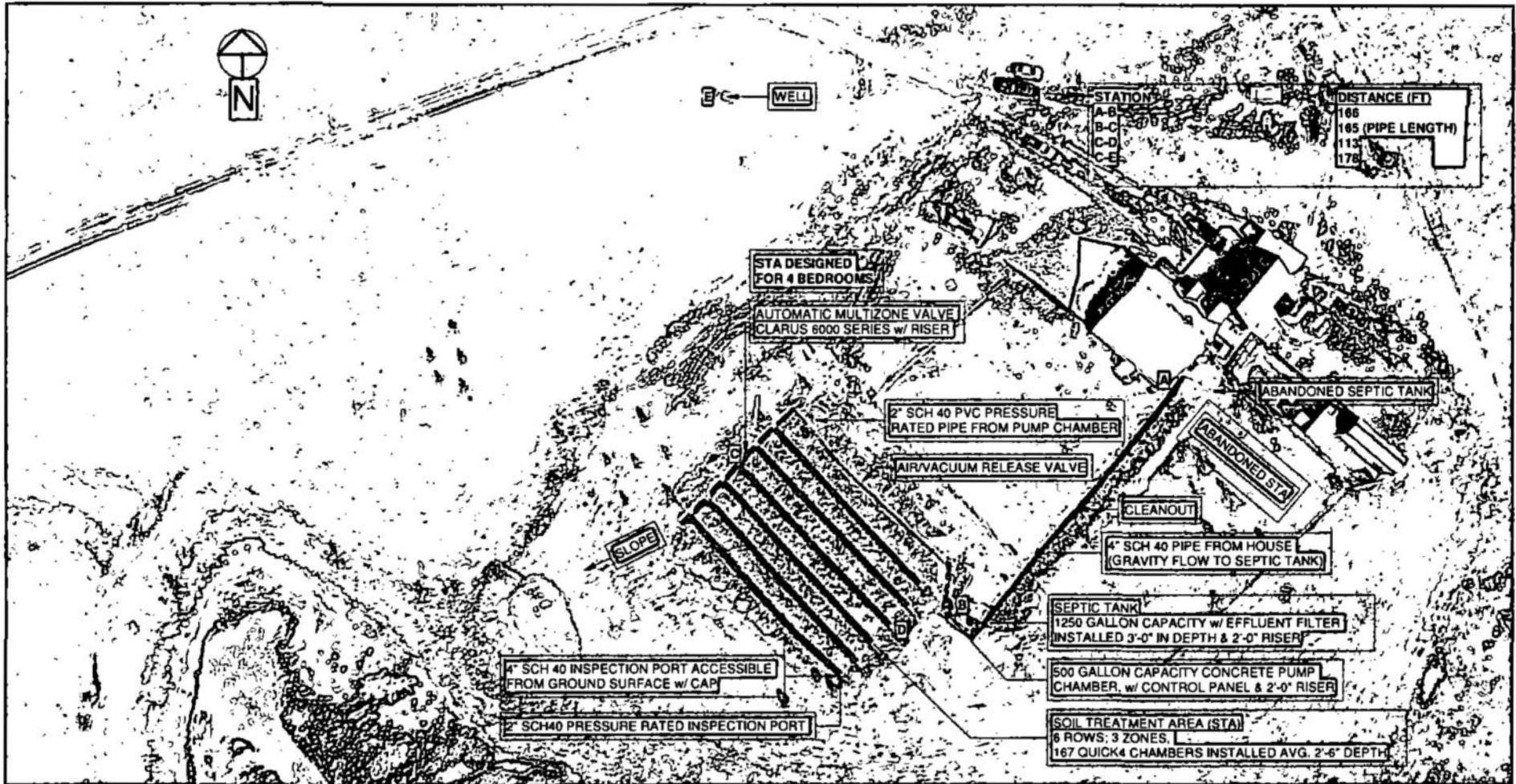
Treatment Level: 1 1PD 2 2N 3 3N

OWTS Tank: GPS Location: 39°06.055'N 104°39.600'W
Construction Material: Concrete Capacity (gallon): 1250 Existing New

OWTS Pump Tank: YES NO Capacity (gallon): 500 Audio/visual Alarm: YES NO
Pump (Gal/dose): 175 Dose: 30 GPM Total Dynamic Head: 20 Ft Elevation difference:

Soil Treatment Area (STA): GPS Location: 39°06.066'N 104°39.615'W Total Sq. Ft installed: 2004
Configuration: Trench Bed Distribution: Gravity Pressure Dosed NDDS
 Rock and Pipe: Width: Total Length: Installation Depth:
Depth of Rock (under pipe): Type of cover on Rock:
 Chambers: Type: Quick 4+ Sq. Ft./chamber: 12 No. Chambers: 167 Installation Depth (range): 6-24"
 NDDS: # Zones: # Laterals/zone:
 Seepage Pit: # Rings:

Notes: _____



① Site Map - AS-BUILT
1" = 50'-0"



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

8855 WALKER ROAD, 80908

As-Built

Project number 17.579
Date 02/13/18
Drawn by S.DUNFEE
Checked by C.PARR

C1 A.B.

Scale 1" = 50'-0"

Notify Environmental Health of any change of ownership, type of business activity, business name, or billing address by calling (719) 578-3199. Failure to notify Environmental Health may result in late penalties, Permit/License denial or revocation, and business closure. PERMITS/LICENSES TO OPERATE AND ANNUAL FEE PAYMENTS ARE NOT TRANSFERABLE. Permits become void on change of ownership. New owners must apply and pay for a new Permit(s)/License(s) prior to beginning operation.

Attn: NEAL EBY
8855 WALKER RD
COLORADO SPRINGS, CO 80908



**EL PASO COUNTY PUBLIC HEALTH
ENVIRONMENTAL HEALTH DIVISION**
1675 W. GARDEN OF THE GODS ROAD, SUITE 2044
COLORADO SPRINGS, CO 80907
PHONE: (719) 578-3199 FAX: (719) 578-3188
www.elpasocountyhealth.org

MAJOR REPAIR PERMIT - OWTS

Valid From 1/18/2018 To 1/18/2019

PERMITEE :

**NEAL EBY
8855 WALKER RD
COLORADO SPRINGS, CO 80908**

Onsite ID: ON0034428

Tax Schedule # : 5110001009

Permit Issue Date: 01/18/2018

Dwelling Type: RESIDENTIAL

of Bedrooms (if Res): 4

Proposed Use (if Comm):

Designed Gallons/Day:

Water Source: PRIVATE WELL

OWNER NAME :

NEAL EBY

System Installation Requirements:

- An Engineered OWTS system to be installed on site due to encountering seasonal and standing groundwater 7 feet.
- System installation to include pressure dosed chamber in trenches, max installation depth of 36" due to ground water evidence. Minimum tank requirements 1250 gallon and 1960 sq ft of soil treatment area (164 Q4 / 131 Arc 36 chambers required).
- The system must be installed per approved Parr Engineering design document #17.579 stamped and dated 12.18.2017, changes to the approved design document must be submitted and approved by Public Health prior to installation.
- All horizontal setbacks must be maintained through system installation. In addition system must remain completely uncovered, including the tank size, for final inspection.
- Engineered systems require the as built drawing and certification letter from the engineer be submitted to Public Health prior to final approval and Regional Building sign off
- Ensure that all work is completed prior to contacting and requesting final line for inspection, otherwise additional fees may be incurred.

Notify Environmental Health of any change of ownership, type of business activity, business name, or billing address by calling (719) 578-3199. Failure to notify Environmental Health may result in late penalties, Permit/License denial or revocation, and business closure. PERMITS/LICENSES TO OPERATE AND ANNUAL FEE PAYMENTS ARE NOT TRANSFERABLE. Permits become void on change of ownership. New owners must apply and pay for a new Permit(s)/License(s) prior to beginning operation.

Attn: NEAL EBY
8855 WALKER RD
COLORADO SPRINGS, CO 80908

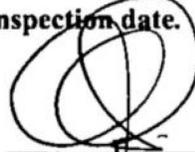


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This permit is issued in accordance with 25-10-106 Colorado Revised Statutes. The PERMIT EXPIRES upon completion/installation of the Onsite Wastewater Treatment System, or at the end of twelve (12) months from date of issue, whichever occurs first. If both a Building Permit and an Onsite Wastewater Treatment System Permit are issued for the same property and construction has not commenced prior to the expiration date of the Building Permit, the Onsite Wastewater Permit shall expire at the same time as the Building Permit. This permit is revocable if all stated requirements are not met. The Onsite Wastewater Treatment System must be installed by an El Paso County Licensed System Contractor, or the property owner.

The Health Officer shall assume no responsibility in case of failure or inadequacy of an Onsite Wastewater Treatment System, beyond consulting in good faith with the property owner or representative. Access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with the requirements of this law (permit).

Inspection request line: Call (719) 575-8699 before 3:30 p.m. the business day prior to the requested inspection date.



Authorized By: Environmental Health Specialist

1/18/18 Fredrick Mayes

SP0008110 AR0012332 ON0034428

APPLICATION FOR AN ON-SITE WASTEWATER TREATMENT SYSTEM PERMIT

Property Information:

Property Address: 8855 Walter Rd. City and Zip: Colorado Springs

Legal Description: _____

Tax Schedule #: _____ Lot size: _____

Is the property gated: Yes No Please provide a gate code if necessary: _____

Site Located Inside City Limits: Yes No Proposed Use: Residential Commercial

Water Supply: Well Cistern Municipal Potential Number of Bedrooms: 7

Has a Conditional Acceptance Document been issued for this property: Yes No Unsure

Owner Information: Primary Contact

Owner: _____ Daytime Phone: _____

Owners Mailing Address: _____

Email Address: _____ Fax #: _____

General Contractor: _____ Phone/Email: _____

OWTS Installer Information: Primary Contact

System Installer: Peak Excavating & Septic LLC. Daytime Phone: 719-588-1877

Email Address: peak14108septic@gmail.com Licensed installer: Tier 1 Tier 2

All engineer-design systems must be installed by a Tier 2 licensed installer

CURRENT FEES AS APPROVED BY THE EL PASO COUNTY BOARD OF HEALTH

All payments are due at the time of application submittal; by cash, check or major credit card (Visa / MC)

New Permit: \$750.00 (EPCPH Charge) + \$147.00 (EPC Planning Dept. Surcharge) + \$23.00 (CDPHE Surcharge) = \$920.00

Major Repair Permit: \$535.00 (EPCPH Charge) + \$23.00 (CDPHE Surcharge) = \$558.00

Minor Repair Permit: \$245.00 (EPCPH Charge) + \$23.00 (CDPHE Surcharge) = \$268.00

Permits expire one year from date of issuance, unless otherwise noted

PD 263 on 10/27
\$295.00 due

REQUIRED: Provide a complete written scope of work to be performed on the property.

Pulled minor permit at location. Need major for complete system & Tank Replacement.

The following documents **MUST** be included with your application.

- A soils report: including at least 1 soil profile excavation pit, in accordance with section 8.5 A-F of OWTS regulations
- A clear and legible design document: including the proposed and alternate locations, as well as system layout, labeled with all setbacks to pertinent structures and features in table 7-1.
- Provide directions to property, from a main highway, on the back side of application.

Failure to provide the above listed documents may result in denial of the permit application

I certify that the information provided on this application is in compliance with Section 8.3, Chapter 8 of the On-site Wastewater System (OWS) Regulations of the El Paso County Board of Health. I also authorize the assigned representative of El Paso County Public Health to enter onto this property in order to obtain information necessary for the issuance of a permit.

Applicant Signature: [Signature] Date: 4/19/18

Net

- Property address or lot number must be clearly marked and visible from the road.
- Profile excavation test pit and/or soil profile holes must be clearly marked
- Proposed and alternate soil treatment areas must be protected from compaction and disturbance
- Locked gates require the gate code or lock combination be provided on front of application
- Please provide directions to the property from a main highway, by text or picture, below.

Failure to comply with the above information may result in an additional charge for a return trip.

Permit #: _____ **Site Inspection date:** 1/11/18
Date Approvals Rcvd: Development Services: _____ Floodplain/enumerations: _____
Design: Conventional Engineer **Design Engineer:** Parr Engineering + Consulting, Inc
Engineer Job #: 17.579 **Engineer Date Stamped:** 12/18/17
LTAR/Soil Type: 0.15 / Soil Type 4A **Groundwater:** PP1 / 7' **PP2 Bedrock:** PP1 PP2
Minimum Requirements: Tank Capacity: 1250 **Soil Treatment Area:** 1960
System Feed: Gravity Pump to Gravity Pressure Dosed Other: _____
System Media: Chambers Rock and Pipe Other **Soil Treatment Area:** Trenches Bed
Additional Comments: _____

E.H. Specialist: Neil May **Date:** 1/17/18 Approved Denied