ENTECH
ENGINEERING, INC.
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COLORADO SPRINGS, CO 80907
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**WASTEWATER STUDY**
**SADDLEHORN RANCH – FILING NO. 3**
**CURTIS ROAD & JUDGE ORR ROAD**
**EL PASO COUNTY, COLORADO**

Prepared for

**Gorilla Capital, LLC**
1342 High Street
Eugene, Oregon 97401

Attn: John Helmick

November 15, 2022
Revised May 17, 2023

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Reviewed by:

Joseph C. Goode, Jr, P.E.
President

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JOSEPH COLLIN GOODE JR.
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PROFESSIONAL ENGINEER
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LLL

Encl.

Entech Job No. 230509
AAprojects/2023/230509 wws

PCD Fil No. SF-234

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# 1.0 SUMMARY

## *Project Location*

The project site lies in portions southwestern ¼ and the northern ½ of Section 3, Township 13 South, Range 64 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 3 miles east of Falcon, Colorado, southeast of the intersection of Curtis Road and Judge Orr Road.

## *Project Description*

Total acreage involved in the project is approximately 175 acres. The proposed site development consists of forty-four (44) single-family rural residential lots. The development will be serviced by Saddlehorn Ranch Metropolitan water and individual on-site wastewater treatment systems.

## *Scope of Report*

This report presents the results of our geologic evaluation, treatment of engineering geologic hazard study and wastewater study for individual on-site wastewater treatment systems.

## *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 potentially expansive soils, hydrocompaction, loose/collapsible soils, floodplain, potentially seasonal shallow groundwater, seasonal shallow groundwater and areas of ponded water. Based on the proposed development plan, it appears that these areas will have some impact 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.

## 2.0 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in portions of the southwestern ¼ and the northern ½ of Section 3, Township 13 South, Range 64 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 3 miles east of Falcon, Colorado, southeast of Curtis Road and Judge Orr Road. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site varies from very gradually to moderately sloping generally to the southeast. Three drainages that are tributaries to Black Squirrel Creek bisect the overall Saddlehorn Ranch site, with the middle drainage located in Filing 3. Steeper slopes are located along portions of some of the drainages on the site. The drainages in Filing No. 3 flow in a southeasterly direction through Filing No. 3 and are primarily located within drainage easements being avoided by the proposed lots. Water was not observed in the drainages in Filing No. 3 at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included grazing and pasture land. The site contains primarily field grasses and weeds. Site photographs, taken September 28, 2022, are included in Appendix A.

Total acreage involved in the proposed development is approximately 175 acres with forty-four (44) single-family rural residential lots, with designated open space and drainage easements. The proposed residential lots range from approximately 2.5 to 3.7 acres. The majority of the lots are approximately 2.5 acres in size. The area will be serviced by Saddlehorn Ranch Metropolitan water and individual on-site wastewater treatment systems. The proposed Site Plan/Testing Location Map is presented in Figure 3.

The site was previously investigated as part of a Preliminary Soils, Geology, Geologic Hazard and Wastewater Study, Entech Job No. 181823 (Reference 1). Four (4) test borings, and forty-five (45) tactile test pits were performed on the site to determine general suitability of the site for construction and the use of on-site wastewater treatment systems. The previous report/investigation was used as part of this investigation. More specifically one (1) test boring (TB-4), and ten (10) of the previous test pits were used as part of the Saddlehorn Ranch – Filing No. 3 investigation. Eight (8) additional test borings and one (1) test pit were completed for Saddlehorn Ranch – Filing No. 3. The Test Pit Logs are included in Appendix B, the Laboratory Testing Results are included in Appendix C, and a Summary of the Laboratory Testing Results is presented in Table 1.

## 3.0 SCOPE OF THE REPORT

The scope of the report includes the evaluation of the site for individual on-site wastewater treatment systems in accordance with El Paso Land Development Code.

## 4.0 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS) (previously the Soil Conservation Service (SCS)) survey data 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 air 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 28, 2022.

Four (4) test borings, and forty-five (45) tactile test pits were previously performed on the site to verify general soil conditions and the suitability of the site for the use of on-site wastewater treatment systems (Reference 1). Ten (10) of the previous Test Pits (TP-26, TP-27, TP-31, TP-23, TP-33, TP-34, TP-35, TP-36, TP-41, & TP-42) were used as part of the Saddlehorn Ranch – Filing No. 3 investigation. Eight (8) additional test borings and one (1) test pit were completed for Saddlehorn Ranch – Filing No. 3. The locations of the test pits are indicated on the Site Plan/Testing Location Map, Figure 3. The Test Pit Logs are included in Appendix B, the Laboratory Testing Results are included in Appendix C, and a Summary of the Laboratory Testing Results is presented in Table 1. 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, and Atterberg Limits, ASTM D-4318 for classification purposes. Volume change testing was performed on selected samples using the FHA Swell Test and Swell/Consolidation Test, ASTM D-4546, in order to evaluate the expansion/consolidation potential of the soils. Soluble sulfate testing was performed on selected samples to determine the corrosive characteristics of the soils on concrete

placed below ground. Results of the laboratory testing are included in Appendix C. The Laboratory Test Results are summarized in Tables 1 and 2.

# 5.0 SOIL, GEOLOGY AND ENGINEERING GEOLOGY

## *5.1 General Geology*

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 18 miles to the west 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 the southeastern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be very gently dipping in a northwesterly direction (Reference 2). The rocks in the area of the site are sedimentary in nature and typically Tertiary to Upper Cretaceous in age. The bedrock underlying the site consists of the Dawson Arkose Formation. Overlying this formation are unconsolidated deposits of man-made fill deposits, residual soils, eolian soils, and alluvial soils of the Quaternary Age. The residual soils are produced by the in-situ action of weathering of the bedrock on site. The alluvial soils were deposited by water in the major drainages on the site and as stream terrace deposits. The eolian soils were deposited by prevailing winds from the west and northwest. The site's stratigraphy will be discussed in more detail in Section 5.3.

## *5.2 Soil Conservation Survey*

The Natural Resource Conservation Service (Reference 3), previously the Soil Conservation Service (Reference 4) has mapped three soil types on the site (Figure 4). In general, they vary from loam, loamy sands, and sandy loam. The soils are described as follows:

| Type | Description |
|---|---|
| 8 | Blakeland Loamy Sand, 1-9% slopes |
| 19 | Columbine Gravelly Sandy Loam, 0 to 3% slopes |
| 29 | Fluvaquentic Haplaquolls, nearly level |

Complete descriptions of each soil type are presented in Appendix D. The soils have generally been described to typically have moderate to very rapid permeabilities. The majority of the soils have rapid permeabilities. Limitations described for the soils include the hazard of flooding on Soil Type Nos. 19 and 29. Soil Type No. 29 is mapped in the floodplain zone that is designated as open space. Roads may need to be designed to minimize frost-heave potential. Possible hazards

with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The majority of the soils have been described to have slight to moderate erosion hazards.

### *5.3 Site Stratigraphy*

The Falcon Quadrangle Geology Map showing the site is presented in Figure 5 (Reference 5). The Geology Map prepared for the site is presented in Figure 6. Five mappable units were identified on the overall site which are described as follows:

**Qal** **Recent Alluvium – Post Piney Creek (Alluvium One) of Late Holocene Age:** These materials consist of water deposited sands located along some of the minor drainages across the site. The materials consist of silty to clayey sand and sandy clays.

**Qp** **Piney Creek Alluvium (Alluvium Two) of Early Holocene Age:** These materials consist of low stream-terrace deposits above the current stream channels. The materials typically consist of silty to well graded sand.

**Qb** **Broadway Alluvium (Alluvium Three) of Late Pleistocene Age:** These materials consist of middle steam terrace deposits. The materials typically consist of silty to clayey gravelly sands.

**Qes** **Eolian Sand of Quaternary Age:** These deposits are fine to medium grained soil deposited on the site by the action of prevailing winds from the west and northwest. They typically occur as large dune deposits or narrow ridges. These soils are typically tan to brown in color and tend to have very uniform or well-sorted gradation. These materials tend to have a relatively high permeability and low density.

**Qes/Tkd** **Eolian Sand Deposits of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The Dawson Formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone. Overlying this formation is a variable layer of eolian sand and residual soil, undifferentiated. The eolian sands were deposited by the action of the prevailing winds. The residual soils were derived from the in-situ weathering of the bedrock materials on-site. These soils consisted of silty to clayey sands, sandy clays and sandy silts.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Falcon Quadrangle* distributed by the Colorado Geological Survey in 2012 (Reference 5), and the *Geologic Map of the Pueblo $1^0$ x $2^0$ Quadrangle*, distributed by the US Geological Survey in 1978 (Reference 6). The Test Pits were also used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

### *5.4 Soil Conditions*

The soils encountered in the Test Borings and Test Pits can be grouped into four 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 well-graded sand, slightly silty to silty sand and clayey to very clayey sand (SW, SM-SW, SM, SC). This material was encountered in all of the test pits. The sand was encountered at depths ranging from the existing surface to 4 feet, and extending to depths of 4 to 17 feet bgs. These soils were encountered at loose to medium dense states and at dry to moist conditions. Samples tested had 3 to 28 percent of the soil size particles passing the No. 200 Sieve. Atterberg Limits Testing resulted in non-plastic results.

Soil Type 2 is a sandy clay and very sandy silt (CL, ML). This material was encountered in Test Boring Nos. 1 and 2. The clays were encountered at depths ranging from the existing surface to 14 feet bgs and extended to depths of 4 to 17 feet. The clay was encountered at firm consistencies and moist conditions. The samples tested had 61 to 72 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in liquid limits of 32 to 41 and plastid indexes of 10 to 18. Swell/Consolidation Testing resulted in a volume change of 0.8 percent, indicating a low expansion potential. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating the sandstone exhibits negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 3 is a silty to very silty sandstone and clayey to very clayey sandstone (SM, SM-SW, SC). This material was encountered in eight of the test borings. The sandstone was encountered at depths ranging from 3 to 17 feet bgs and extended to termination of the test borings and pits (5 to 20 feet). The sandstone was encountered at dense to very dense states and moist conditions. Samples tested had 9 to 26 percent of the soil sized particles passing the No. 200

sieve. Atterberg Limits Testing resulted in non-plastic results. Highly expansive clayey sandstone and claystone are commonly interbedded in the sandstone in the area. Sulfate testing resulted in 0.01 percent soluble sulfate by weight, indicating the sandstone exhibits negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 4 is a sandy claystone and very sandy siltstone (CL, ML). This material was encountered two of the test borings at 15 to 17 feet bgs and extended to the termination of the test borings (20 feet). The claystone and siltstone were encountered at hard consistencies and moist conditions. Samples tested had 52 to 57 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in liquid limits of 30 to 46 and plastic indexes of 12 to 15. Swell/Consolidation Testing on a samples resulted in volume changes of 0.0 to 0.2, indicating a low expansion potential.

The Test Borings and Test Pit Logs are presented in Appendix B. Laboratory Test Results are presented in Appendix C. The Laboratory Test Results are summarized on Table 1.

### *5.5 Groundwater*

Groundwater or signs of seasonal groundwater were encountered in eight of the test borings and in three of the test pits within Filing No. 3 at depths ranging from 3.5 to 14.5 feet. A detailed table of groundwater measurements is included in with the CGS Response Letter in Appendix F. Areas of seasonal and potentially seasonal shallow groundwater have been mapped in low-lying areas and in the drainages on the site. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Isolated sand layers within the variable soil profile, sometimes only a few feet in thickens and width, can carry water in the subsurface. Additionally, perched water conditions can occur on this site where water can flow through permeable sands overlying less permeable bedrock. Builders and planners should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site and deal with each individual problem as necessary at the time of construction.

Floodplain and Drainage Areas – Constraint

Portions of the site associated with tributaries of the Black Squirrel Creek drainage are mapped within a floodplain zone according to the FEMA Map No. 08041C0558G, dated December 7, 2018 (Figure 7, Reference 7). Areas of ponded water were observed in the central portion of the site

near the windmill. The floodplain areas have been designated as open space and/or can be avoided by construction. Additionally, areas of seasonal and potentially seasonal shallow groundwater were observed across the site. In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These are low-lying areas along the drainage in the southern half of Filing No. 3 and in the low-lying areas and minor drainages across the site. These areas can likely be avoided or properly mitigated by development. Perched water conditions could be encountered across the entire site where water can flow within permeable sand layers overlying impermeable bedrock. These areas should be identified on an individual basis at the time of construction. Where perched water conditions are encountered, the mitigation recommendations for seasonal and potentially seasonal shallow groundwater should be followed. Foundations should maintain a minimum separation of 3 feet between the foundation grade and the maximum anticipated groundwater level. The floodplain should be avoided by construction unless site-specific floodplain determination and drainage studies are performed. These areas are discussed below.

## 6.0 ON-SITE WASTEWATER TREATMENT

The site was evaluated for individual and commercial on-site wastewater treatment systems in accordance with El Paso Land Development Code. Forty-five (45) tactile test pits were performed on the property, eleven (11) test pits were located within Filing No. 3. The test pits were placed in potential locations of future systems. The approximate locations of the test pits are indicated on Figure 3, on the Geology/Engineering Geology Map, Figure 6, and on the Septic Suitability Map, Figure 8. A table showing the results of the Tactile Test Pits is presented in Table 3. Test Pit Logs are included in Appendix B and D.

The Natural Resource Conservation Service (Reference 3), previously the Soil Conservation Service (Reference 4) has mapped the site with three soil descriptions. The Soil Survey Map (Reference 3) is presented in Figure 4, and the Soil Survey Descriptions are presented in Appendix D. The soils are described as having moderate to very rapid percolation rates. The majority of the soils have been described with rapid permeabilities. The Natural Resource Conservation Service (NRCS) has rated the soil suitability with respect to septic tank absorption fields. The soils in the area have been described as very limited due to seepage, bottom layer, and filtering capacity. These areas are typically associated with shallow groundwater, shallow bedrock, and unsuitable soils which require designed systems. Flooding and depth to saturation

zone are limitations on Soil Type 29. The majority of the areas mapped with Soil Type 29 lie within the drainage areas and will be avoided by development. The map and descriptions for the NRCS Septic Tank Absorption Field Soil Rating are included in Appendix E.

Soils encountered in the tactile test pits consisted of loamy sand, sandy clay loam and sandy clay. Bedrock was encountered in Test Pit Nos. 32, 34, and 42 at depths of 4.5 to 6 feet. The test pits were excavated to depths of 6.5 to 8 feet. Groundwater or signs of seasonally occurring groundwater were encountered at depths of 5 to 7.5 feet in three of the test pits. The limiting layers encountered in the test pits are the sandy loam (Soil Type 2), sandy clay loam (Soil Type 3A), and sandy clay, sandy claystone, and sandstone (Soil Type 4A) which corresponds to LTAR values ranging from 0.80 to 0.15 gallons per day per square foot. Designed systems will be required where bedrock or groundwater are encountered at 6 feet bgs or shallower. Some of the areas tested for Filing No. 3 will be suitable for conventional on-site wastewater treatment systems. Designed systems due to restrictive clay soils, shallow bedrock or shallow groundwater may be required along the drainage in Filing No. 3. Additional investigation of individual lots may identify areas where suitable for conventional systems could be used.

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems (OWTS) and that contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to El Paso County and State Guidelines and properly maintained. Based on the testing performed as part of this investigation designed systems will likely be required for the majority of the lots. A Septic Suitability Map is presented in Figure 8. Areas where OWTS sites are not recommended are also indicated on Figure 8. Individual soil testing is required on each lot prior to construction. Absorption fields must be located a minimum of 100 feet from any well, including those on adjacent properties. Absorption fields must also be located a minimum of 50 feet from any drainages, floodplains or ponded areas and 25 feet from dry gulches.

# 7.0 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 is 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 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 Gorilla Capital, LLC for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

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.

# BIBLIOGRAPHY


1. Entech Engineering, Inc. revised date April 24, 2020. *Soil, Geology, Geologic Hazard and Wastewater Study, Saddlehorn Ranch Subdivision, El Paso County, Colorado.* Entech Job No. 181823.

2. Scott, G.R., Taylor, R.B, Epis, R.C., and Wobus, 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado*. Sheet 2. U.S. Geologic Survey. Map I-1022.

3. Natural Resource Conservation *Service,* September 23, 2016. *Web Soil Survey.* United States Department Agriculture, http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

4. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado.*

5. Morgan, Matthew L. and White, Jonathan L. 2012. *Geologic Map of the Falcon Quadrangle, El Paso and Elbert Counties, Colorado*. Colorado Geological Survey. Open-File Report 12-03.

6. Scott, G.R., Taylor, R.B, Epis, R.C., and Wobus. 1978. *Geologic Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado*. U.S. Geologic Survey. Map 1-1022.

7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Numbers 08041C0558G.

8. El Paso County Planning Development. December 1995. *El Paso County Aggregate Resource Evaluation Maps.*

9. Schwochow, S.D.; Shroba, R.R. and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties*. Colorado Geological Survey. Special Publication 5-B.

10. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.

# TABLES

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## TABLE B-1
### SUMMARY OF LABORATORY TEST RESULTS

| SOIL TYPE | TEST BORING 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 | 4 | 5 | | | 2.9 | | | | | | SW | SAND, SLIGHTLY SILTY |
| 1 | 5 | 5 | | | 13.6 | | | | | | SM | SAND, SILTY |
| 1 | 6 | 2-3 | | | 26.4 | NV | NP | | | | SM | SAND, SILTY |
| 2 | 1 | 2-3 | | | 72.1 | 32 | 10 | <0.01 | | | CL | CLAY, WITH SAND |
| 2 | 2 | 15 | 15.0 | 115.7 | 60.6 | 36 | 12 | <0.01 | | 0.8 | ML | SILT, SANDY |
| 2 | 6 | 10 | | | 67.4 | 41 | 18 | | | | CL | CLAY, SANDY |
| 3 | 2 | 20 | 12.4 | 119.2 | 30.4 | 30 | 12 | 0.00 | | 0.2 | SC | SANDSTONE, (SAND, CLAYEY) |
| 3 | 3 | 15 | | | 9.8 | NV | NP | 0.00 | | | SM-SW | SANDSTONE, (SAND, WITH SILT) |
| 3 | 7 | 15 | | | 9.0 | NV | NP | | | | SM-SW | SANDSTONE, (SAND, WITH SILT) |
| 3 | 8 | 20 | | | 26.1 | | | | | | SM | SANDSTONE, (SAND, SILTY) |

## Table 2: Summary Test Boring Results

| Test Boring No. | Depth to Bedrock (ft.) | Depth to Groundwater or Seasonally Occurring Groundwater (ft.) |
|---|---|---|
| 1 | 17 | 8 |
| 2 | 17 | 6 |
| 3 | 11 | 6 |
| 4 | 11 | 6 |
| 5 | 14 | >20 |
| 6 | 13 | 9 |
| 7 | 3 | 14.5 |
| 8 | 17 | 6 |
| 4* | 15 | 14 |

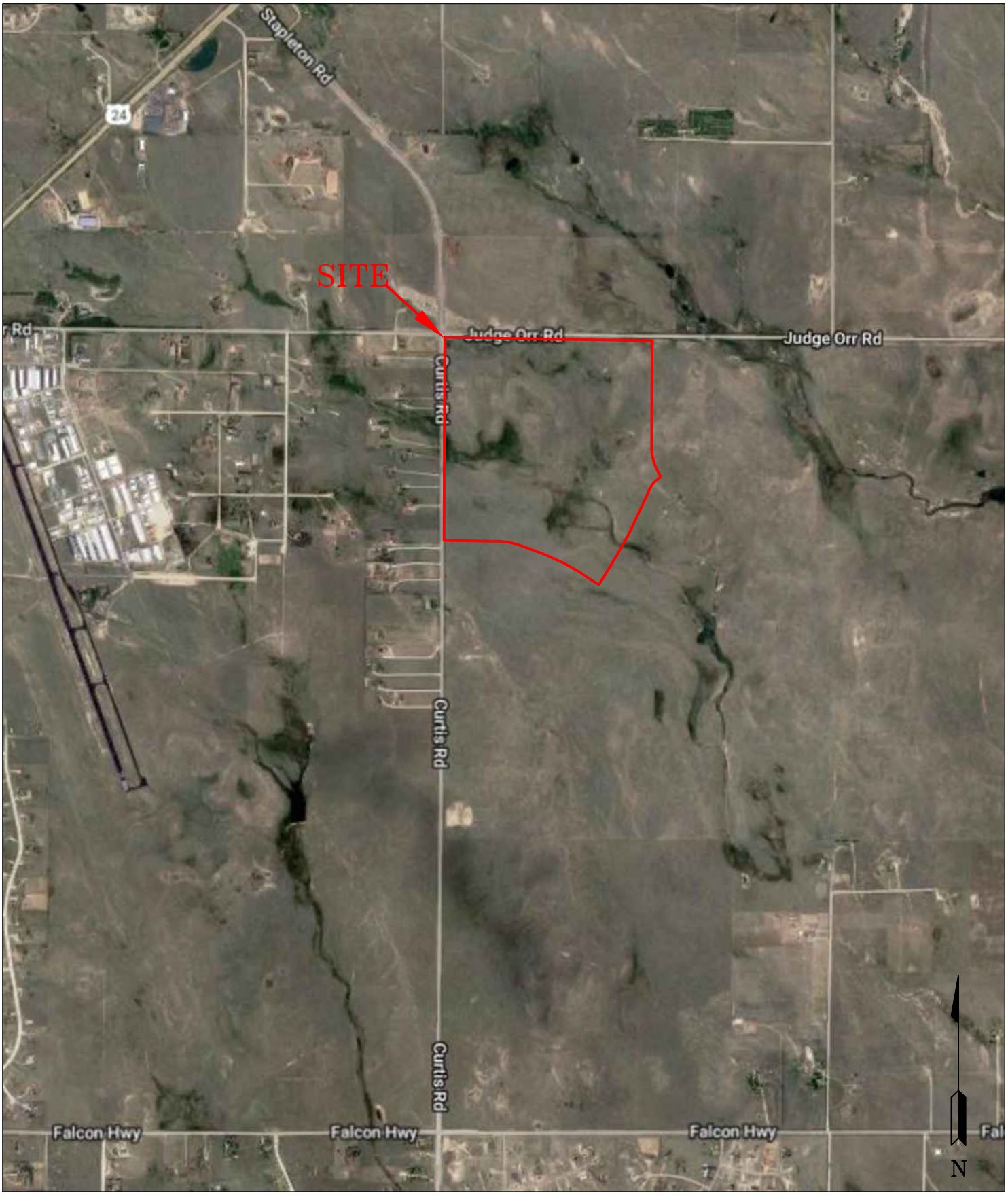
*- Test Boring from EEI Job No. 181823

# Table 3: Summary Tactile Test Pit Results

| Test Pit No. | USDA Soil Type | LTAR Value | Depth to Bedrock (ft.) | Depth to Groundwater or Seasonally Occurring Groundwater (ft.) |
|---|---|---|---|---|
| 1A | 4A* | 0.15 | >8 | 7.5* |
| 26** | 3A* | 0.3 | >8 | >8 |
| 27** | 2A | 0.5 | >8 | >8 |
| 31** | 2A | 0.5 | >8 | >8 |
| 32** | 4A* | 0.15 | 6* | >8 |
| 33** | 2A | 0.5 | >8 | 7.5 |
| 34** | 3A* | 0.3 | 4.5* | >8 |
| 35** | 2A | 0.5 | >8 | >8 |
| 36** | 3A* | 0.3 | >8 | 6* |
| 41** | 4* | 0.2 | >8 | >8 |
| 42** | 4A* | 0.15 | 6* | >8 |

*- Conditions that will require an engineered OWTS
**- Test Pits from EEI Job No. 181823

# FIGURES

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VICINITY MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| LLL | 5/17/23 | | |

JOB NO.: 230509

FIG NO.: 1


ENTECH
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USGS MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

| DRAWN: | DATE: | CHECKED: | DATE: |
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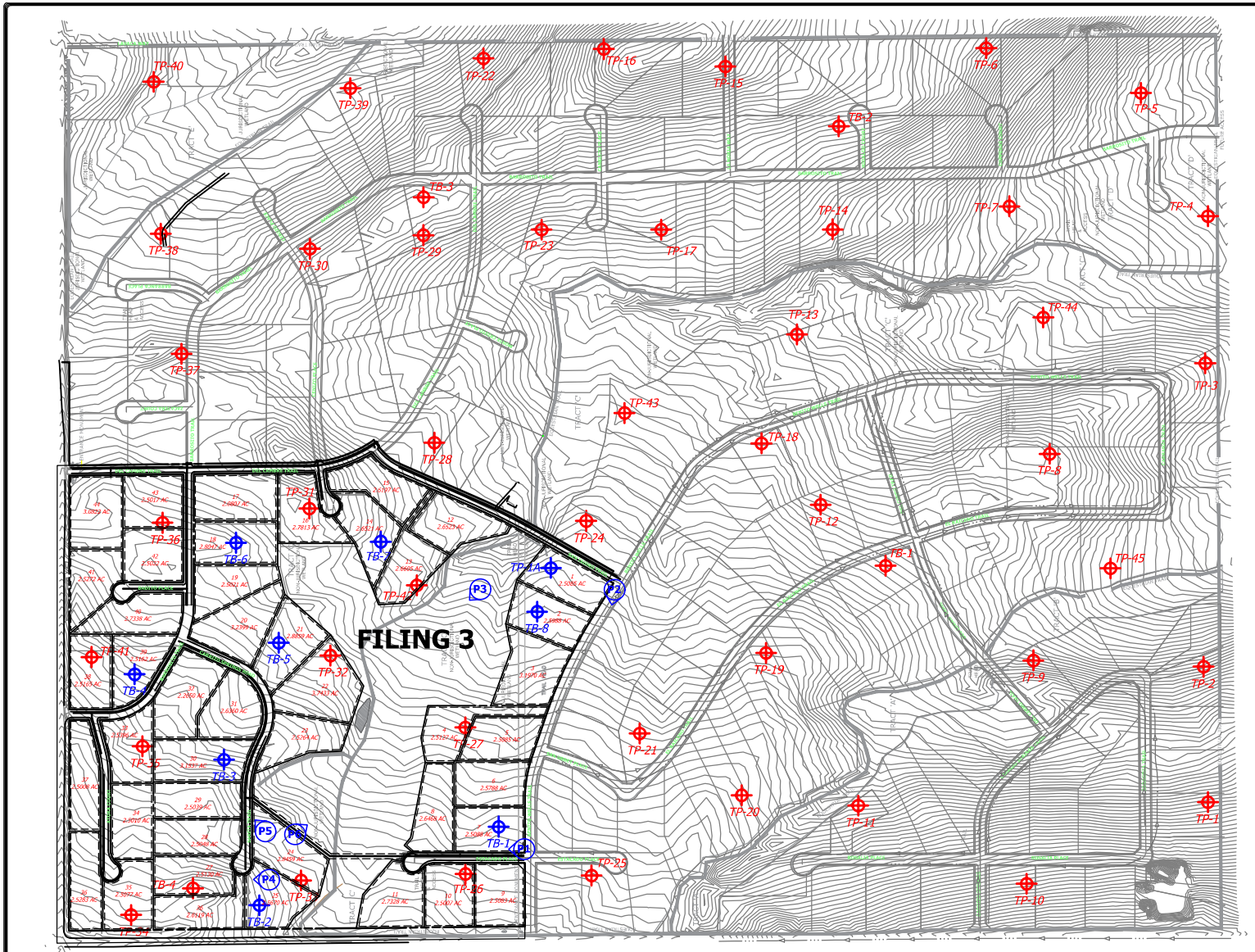
JOB NO.: 230509

FIG NO.: 2




LEGEND:

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

P2 - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (EEI JOB NO. 181823)

TP- APPROXIMATE TEST PIT LOCATION AND NUMBER (EEI JOB NO. 181823)

| REVISION | BY |
|---|---|
| | |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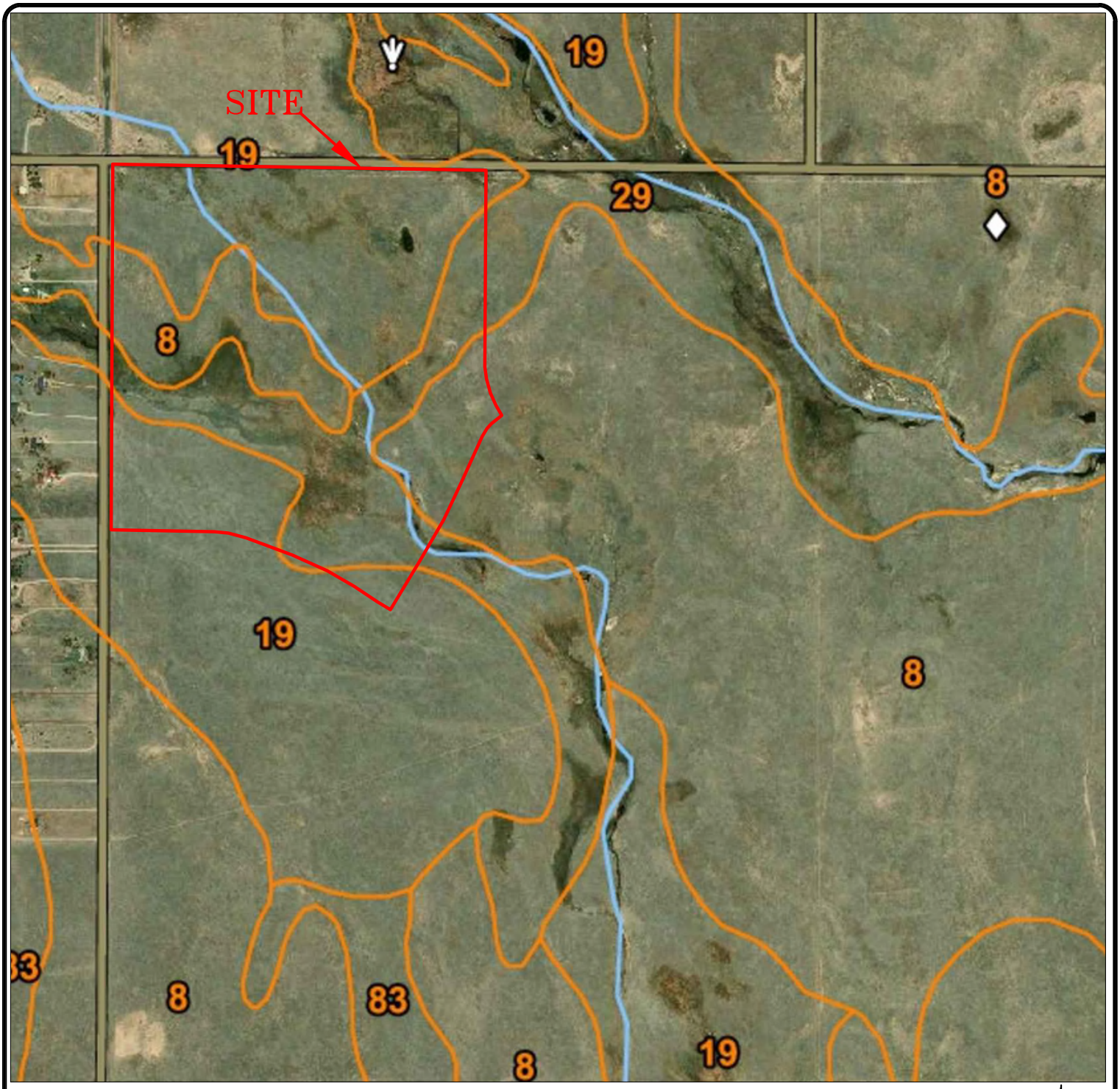
COLORADO SPRINGS, CO. 80907


SITE PLAN/TEST BORING LOCATION MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

| | |
|---|---|
| DRAWN | LLL |
| CHECKED | |
| DATE | 5/17/23 |
| SCALE | AS SHOWN |
| JOB NO. | 230509 |
| FIGURE No. | 3 |

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SOIL SURVEY MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

| DRAWN: | DATE: | CHECKED: | DATE: |
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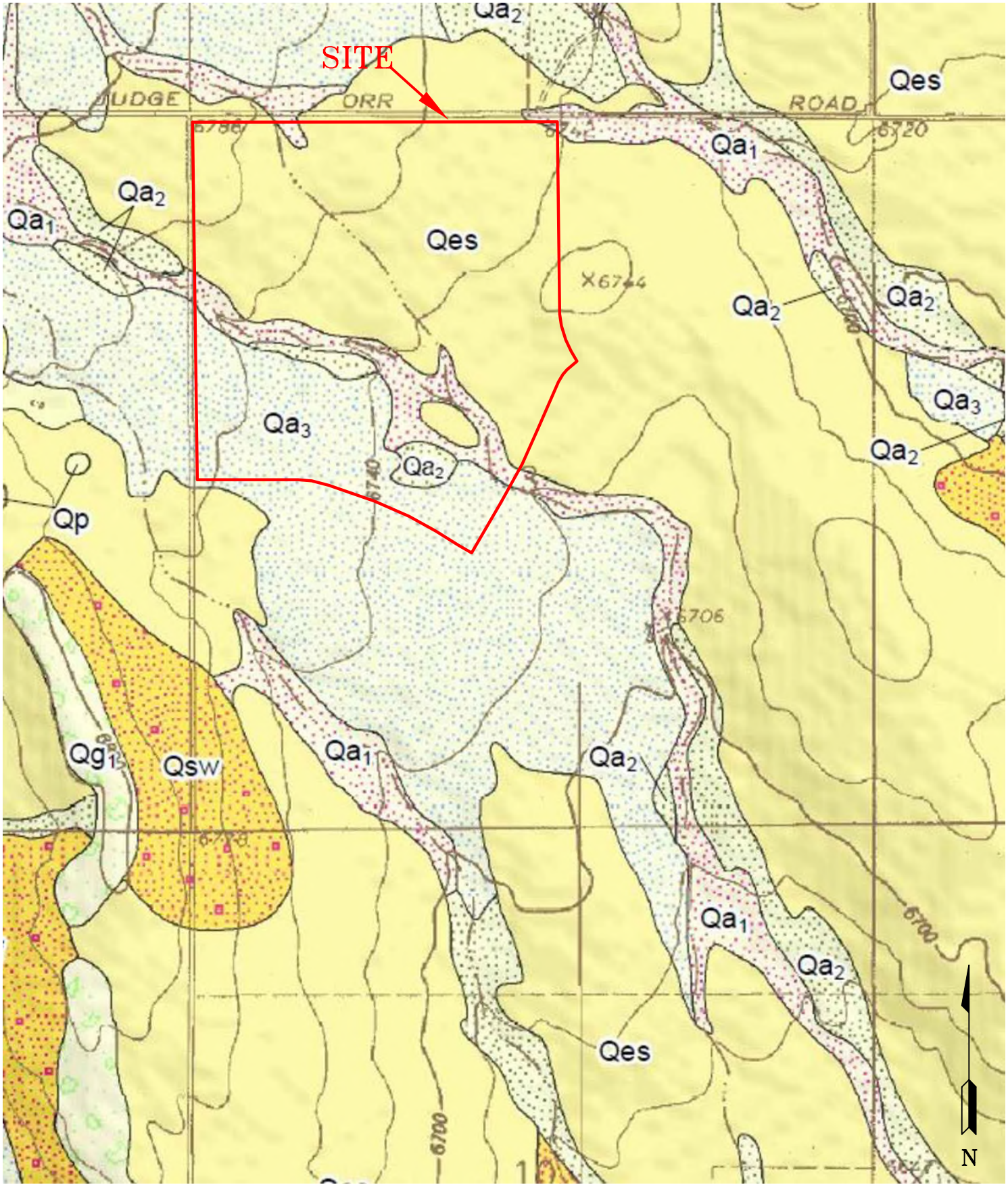
FIG NO.: 4

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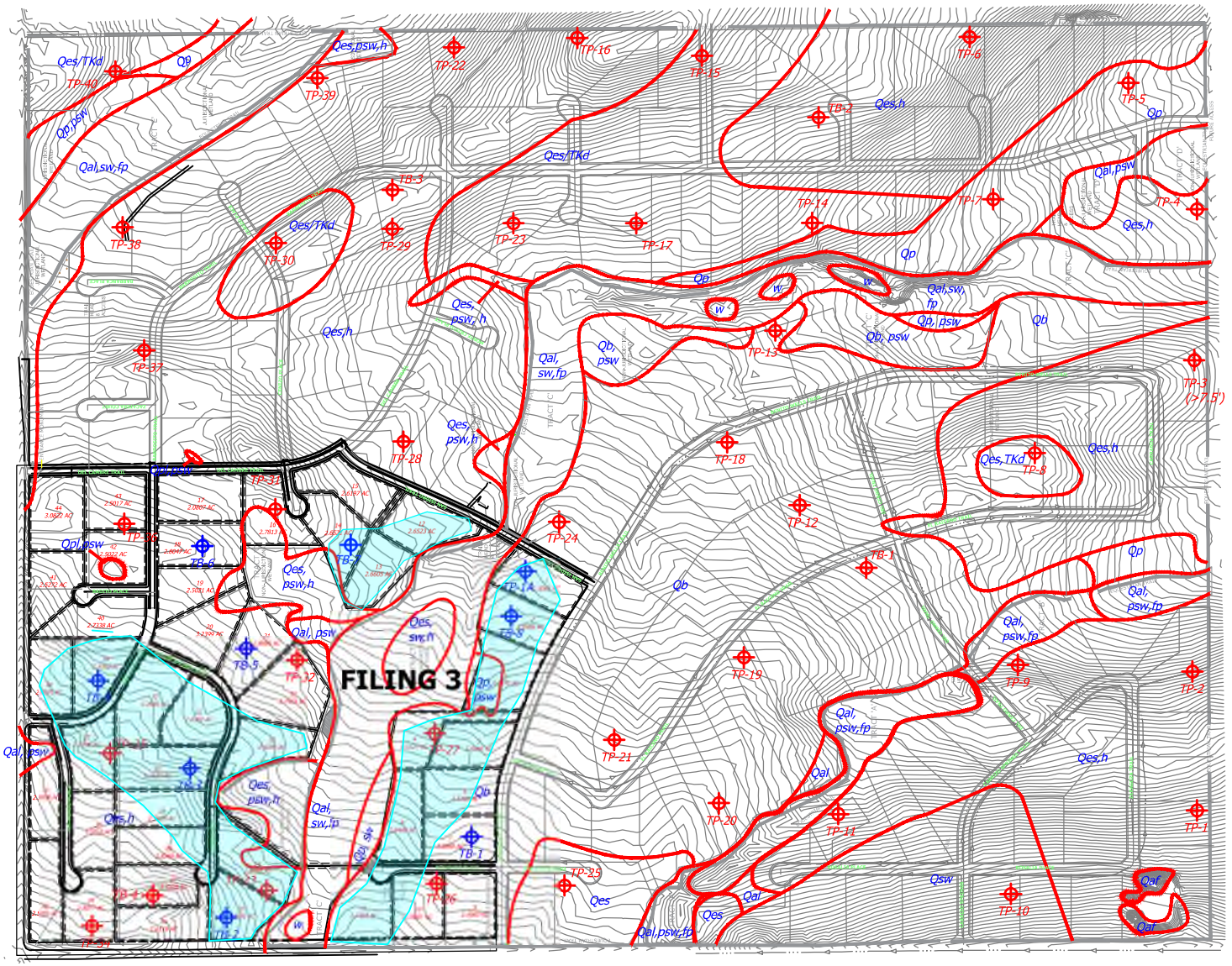
FALCON QUADRANGLE GEOLOGIC MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| LLL | 5/17/23 | | |

JOB NO.: 230509

FIG NO.: 5




LEGEND:

Qaf - Artificial Fill of Holocene Age: man made fill deposits

Qal - Post Piney Creek (Alluvium One)-Recent Alluvium of Late Holocene Age: recent stream desposits

($Qa_1$)

Qpl - Playa Deposits of Holocene Age: blowouts in eolian sand that form seasonal ponds

Qp - Piney Creek Alluvium (Alluvium Two) of Early Holocene Age: low stream terrace deposits above current stream channels

($Qa_2$)

Qb - Broadway Alluvium (Alluvium Three) of Late Pleistocene Age: stream terrace deposited sands

($Qa_3$)

Qes - Eolian Sand of Holocene to Late Pleistocene Age: wind blown sand deposits

Qsw - Sheetwash of Holocene to Late Pleistocene Age: silty to clayey sand sheetwash deposits

Qes/TKd - Sand Deposits of Quaternary Age Overlying Dawson Arkose Formation of Tertiary to Cretaceous Age: windblown sands and residual soil deposits overlying arkosic sandstone with interbedded siltstone and claystone

h - hydrocompaction

fp - floodplain

psw - potentially seasonal shallow groundwater area

sw - seasonal shallow groundwater area

w - flowing / ponded water

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (EEI JOB NO. 181823)

TP- APPROXIMATE TEST PIT LOCATION AND NUMBER (EEI JOB NO. 181823)

| REVISION | BY |
|---|---|
| | |


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


# GEOLOGY/ENGINEERING GEOLOGY MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

DRAWN LLL
CHECKED
DATE 5/17/23
SCALE AS SHOWN
JOB NO. 230509
FIGURE No. 6

# LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| ZONE AR | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| ZONE V | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| ZONE VE | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

| | |
|---|---|
| ZONE X | Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. |

OTHER AREAS

| | |
|---|---|
| ZONE X | Areas determined to be outside the 0.2% annual chance floodplain. |
| ZONE D | Areas in which flood hazards are undetermined, but possible. |

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL. 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

- A — A — Cross section line
- 23 — 23 — Transect line
- 27° 07' 30", 32° 22' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000 M — 1000-meter Universal Transverse Mercator grid tick values, zone 4
- 600000 FT — 5000-foot grid tick values: Hawaii State Plane coordinate system, zone 3 (FIPSZONE 5103), Transverse Mercator projection
- DX5510 X — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M 2 — Coastal Mile marker

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 20, 2000

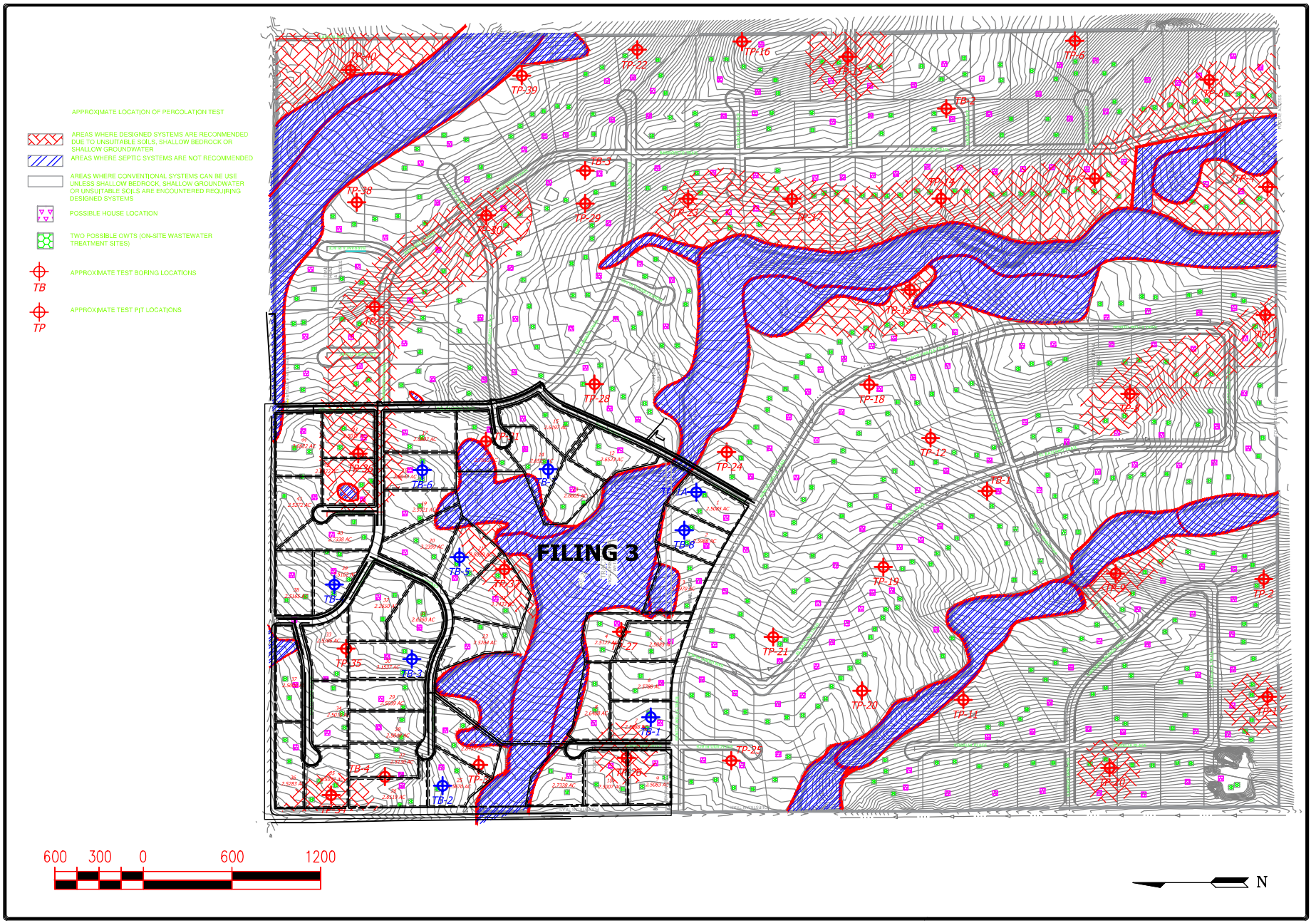
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 30, 2004 – to change Special Flood Hazard Areas, to update map format, to reflect revised shoreline and to incorporate previously issued Letters of Map Revision.


| REVISION | BY |
|---|---|
| | |

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

FLOODPLAIN MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

| | |
|---|---|
| DRAWN | LLL |
| CHECKED | |
| DATE | 5/17/23 |
| SCALE | AS SHOWN |
| JOB NO. | 230509 |
| FIGURE No. | 7 |




| REVISION | BY |
|---|---|
| | |

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
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(719) 531-5599

SEPTIC SUITABILITY MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: GORILLA CAPITAL, LLC

DRAWN LLL
CHECKED
DATE 5/17/23
SCALE AS SHOWN
JOB NO. 230509
FIGURE No. 8

# APPENDIX A:  Site Photographs

1

**Looking north from the southwestern portion of Filing No. 3.**

September 28, 2022

2

**Looking west from the southeastern portion of Filing No. 3.**

September 28, 2022

Job No. 230509

3

**Looking northwest from the southeastern portion of Filing No. 3.**

September 28, 2022

4

**Looking north from the northwestern portion of Filing No. 3.**

September 28, 2022

Job No. 230509

5

**Looking east from the northwestern portion of Filing No. 3.**

September 28, 2022

6

**Looking southeast from the northwestern portion of Filing No. 3.**

September 28, 2022

Job No. 230509

# APPENDIX B:  Test Boring & Test Pit Logs

TEST BORING 1
DATE DRILLED 10/5/2022

REMARKS

WATER @ 8', 10/6/22

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|
| | | | 14 | 6.5 | 2 |
| 5 | | | 10 | 2.2 | 1 |
| 10 | | | 11 | 12.3 | 1 |
| 15 | | | 17 | 11.3 | 2 |
| 20 | | | 50 | 11.7 | 3 |

CLAY, SANDY, GRAY BROWN, STIFF, MOIST

SAND, SILTY, TAN, MEDIUM DENSE, DRY TO MOIST

CLAY, SANDY, GRAY BROWN, STIFF, MOIST

SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST)

TEST BORING 2
DATE DRILLED 10/5/2022

REMARKS

WATER @ 6', 10/6/22

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|
| | | | 17 | 1.4 | 1 |
| 5 | | | 26 | 2.7 | 1 |
| 10 | | | 11 | 11.0 | 1 |
| 15 | | | 32 | 13.7 | 2 |
| 20 | | | 50/7" | 11.4 | 3 |

SAND, SILTY, TAN, MEDIUM DENSE, DRY TO MOIST

SILT, SANDY, GRAY BROWN, HARD, MOIST

SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST)

ENTECH ENGINEERING, INC.

# TEST BORING LOGS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. A-1**

TEST BORING 3
DATE DRILLED 10/5/2022

REMARKS

WATER @ 6', 10/6/22

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|
| | SAND, SILTY, TAN, LOOSE TO DENSE, MOIST | | | | |
| | | | 8 | 3.2 | 1 |
| 5 | | | 16 | 11.7 | 1 |
| | | | | | |
| 10 | | | 37 | 11.0 | 1 |
| | SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST) | | | | |
| 15 | | | 50/8" | 10.6 | 3 |
| | | | | | |
| 20 | | | 50/6" | 15.5 | 3 |

TEST BORING 4
DATE DRILLED 10/5/2022

REMARKS

WATER @ 6', 10/6/22

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|
| | SAND, WITH SILT TO SILTY, TAN, MEDIUM DENSE TO DENSE, DRY TO MOIST | | | | |
| | | | 18 | 1.2 | 1 |
| 5 | | | 33 | 5.4 | 1 |
| | | | | | |
| 10 | | | 37 | 11.7 | 1 |
| | SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST) | | | | |
| 15 | | | 50/9" | 11.4 | 3 |
| | | | | | |
| 20 | | | 50/8" | 10.2 | 3 |

ENTECH ENGINEERING, INC.

# TEST BORING LOGS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. A-2**

TEST BORING 5
DATE DRILLED 10/5/2022

| REMARKS | Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|---|
| DRY TO 20', 10/7/22 | | | | | | |
| SAND, SILTY, TAN, MEDIUM DENSE TO DENSE, MOIST | | | | 10 | 1.0 | 1 |
| | 5 | | | 30 | 2.1 | 1 |
| | 10 | | | * | 5.9 | 1 |
| SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST) | 15 | | | 50 10" | 12.3 | 3 |
| * - BULK SAMPLE TAKEN | 20 | | | 50 9" | 13.2 | 3 |

TEST BORING 6
DATE DRILLED 10/5/2022

| REMARKS | Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|---|
| WATER @ 9', 10/6/22 | | | | | | |
| SAND, SILTY, TAN, MEDIUM DENSE TO DENSE, DRY TO MOIST | | | | 15 | 1.2 | 1 |
| | 5 | | | 20 | 5.4 | 1 |
| | 10 | | | 37 | 11.7 | 1 |
| SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST) | 15 | | | 50 10" | 11.4 | 3 |
| | 20 | | | 50 7" | 10.2 | 3 |

ENTECH ENGINEERING, INC.

# TEST BORING LOGS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. A-3**

TEST BORING 7
DATE DRILLED 10/5/2022

REMARKS

WATER @ 14.5', 10/6/22

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|
| | SAND, SILTY, TAN, DENSE, MOIST | | 41 | 9.5 | 1 |
| | SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST) | | 50/8" | 5.2 | 3 |
| 5 | | | | | |
| 10 | | | 50/9" | 15.3 | 3 |
| 15 | | | 50/8" | 15.0 | 3 |
| 20 | | | 50/6" | 16.6 | 3 |

TEST BORING 8
DATE DRILLED 10/5/2022

REMARKS

WATER @ 6', 10/6/22

| Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|
| | SAND, SILTY, TAN, LOOSE TO DENSE, DRY TO MOIST | | 15 | 1.4 | 1 |
| 5 | | | 9 | 1.6 | 1 |
| 10 | | | 23 | 12.8 | 1 |
| 15 | | | 32 | 12.2 | 1 |
| | SANDSTONE, VERY WEAK, GRAY BROWN, (SAND, WITH SILT, VERY DENSE, MOIST) | | | | |
| 20 | | | 50/9" | 14.6 | 3 |

ENTECH ENGINEERING, INC.

# TEST BORING LOGS

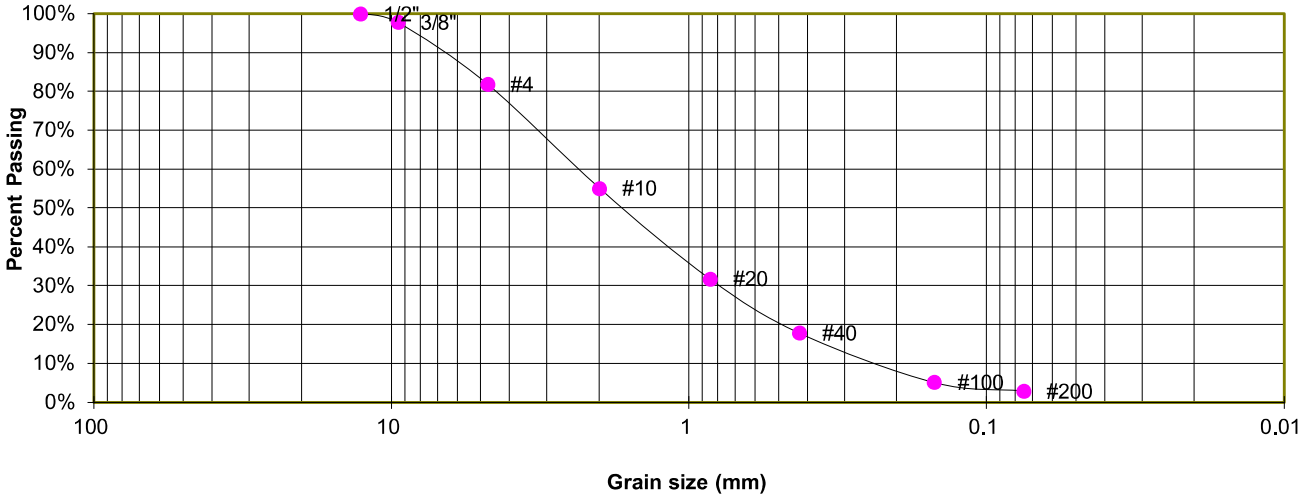
SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. A-4**

# APPENDIX C:  Laboratory Test Results

| | | | |
|---|---|---|---|
| TEST BORING | 4 | SOIL DESCRIPTION | SAND, SLIGHTLY SILTY |
| DEPTH (FT) | 5 | USCS CLASSIFICATION | SW |
| SOIL TYPE | 1 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | 100.0% |
| 3/8" | 97.8% |
| 4 | 81.8% |
| 10 | 55.0% |
| 20 | 31.8% |
| 40 | 17.8% |
| 100 | 5.1% |
| 200 | 2.9% |

ENTECH ENGINEERING, INC.

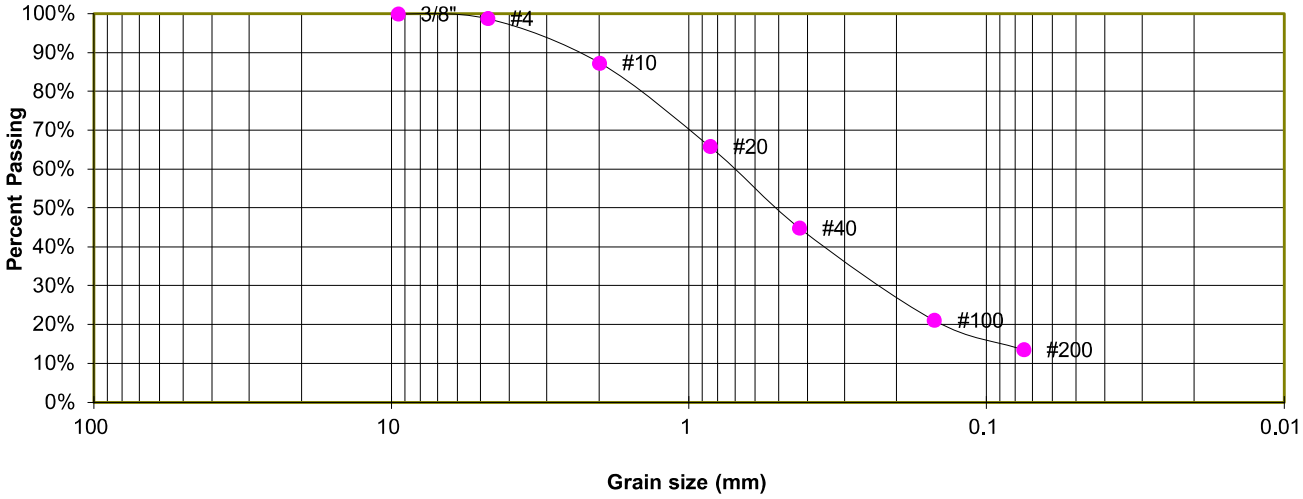
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-1**

| | | | |
|---|---|---|---|
| TEST BORING | 5 | SOIL DESCRIPTION | SAND, SILTY |
| DEPTH (FT) | 5 | USCS CLASSIFICATION | SM |
| SOIL TYPE | 1 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | 100.0% |
| 4 | 98.8% |
| 10 | 87.4% |
| 20 | 65.8% |
| 40 | 44.9% |
| 100 | 21.1% |
| 200 | 13.6% |

ENTECH ENGINEERING, INC.

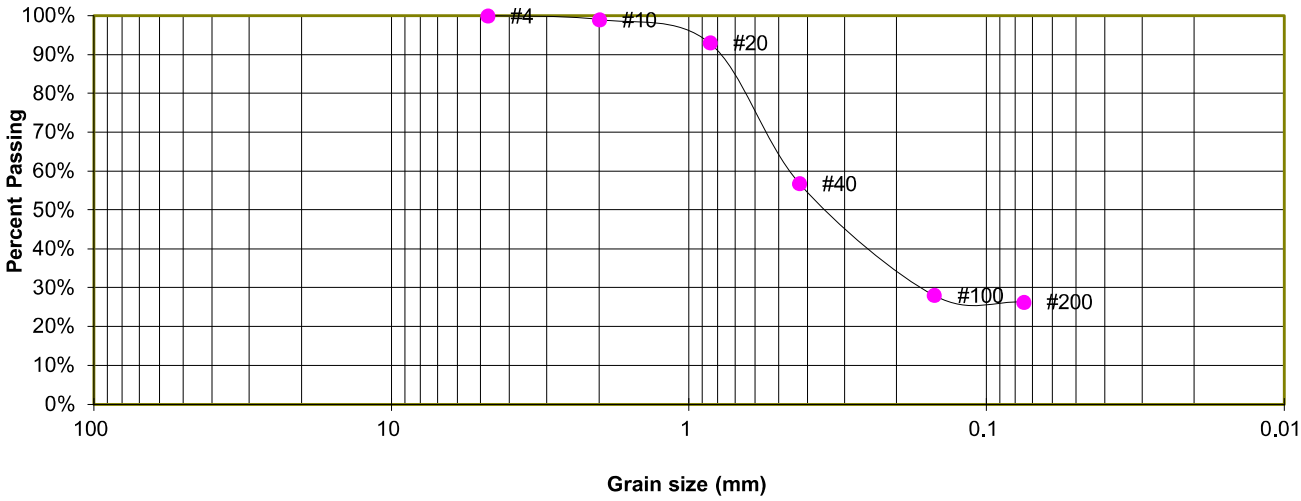
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-2**

| | | | |
|---|---|---|---|
| TEST BORING | 6 | SOIL DESCRIPTION | SAND, SILTY |
| DEPTH (FT) | 2-3 | USCS CLASSIFICATION | SM |
| SOIL TYPE | 1 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | |
| 4 | 100.0% |
| 10 | 99.0% |
| 20 | 93.0% |
| 40 | 56.8% |
| 100 | 28.1% |
| 200 | 26.4% |

**Atterberg Limits**

| | |
|---|---|
| Plastic Limit | NP |
| Liquid Limit | NV |
| Plastic Index | NP |

ENTECH ENGINEERING, INC.

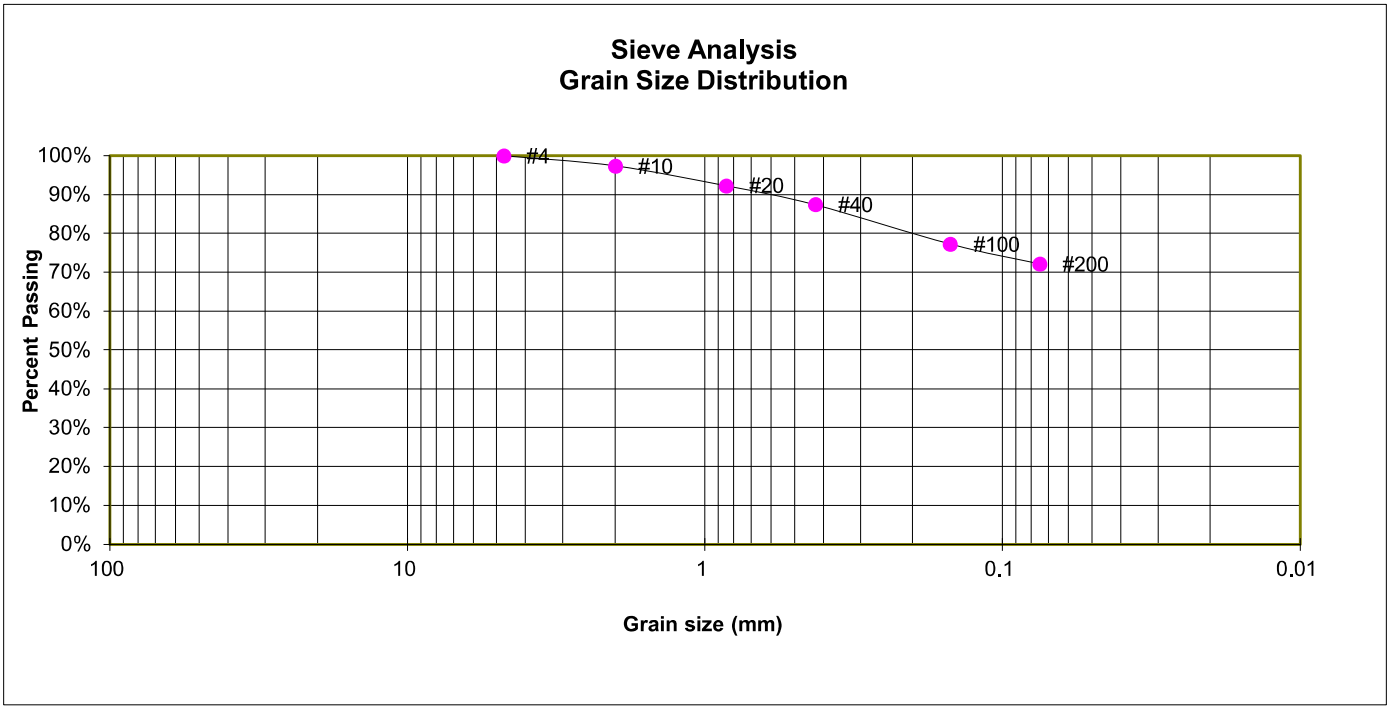
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-3**

| | | | |
|---|---|---|---|
| TEST BORING | 1 | SOIL DESCRIPTION | CLAY, WITH SAND |
| DEPTH (FT) | 2-3 | USCS CLASSIFICATION | CL |
| SOIL TYPE | 2 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | |
| 4 | 100.0% |
| 10 | 97.4% |
| 20 | 92.3% |
| 40 | 87.4% |
| 100 | 77.3% |
| 200 | 72.1% |

| Atterberg Limits | |
|---|---|
| Plastic Limit | 22 |
| Liquid Limit | 32 |
| Plastic Index | 10 |

ENTECH ENGINEERING, INC.

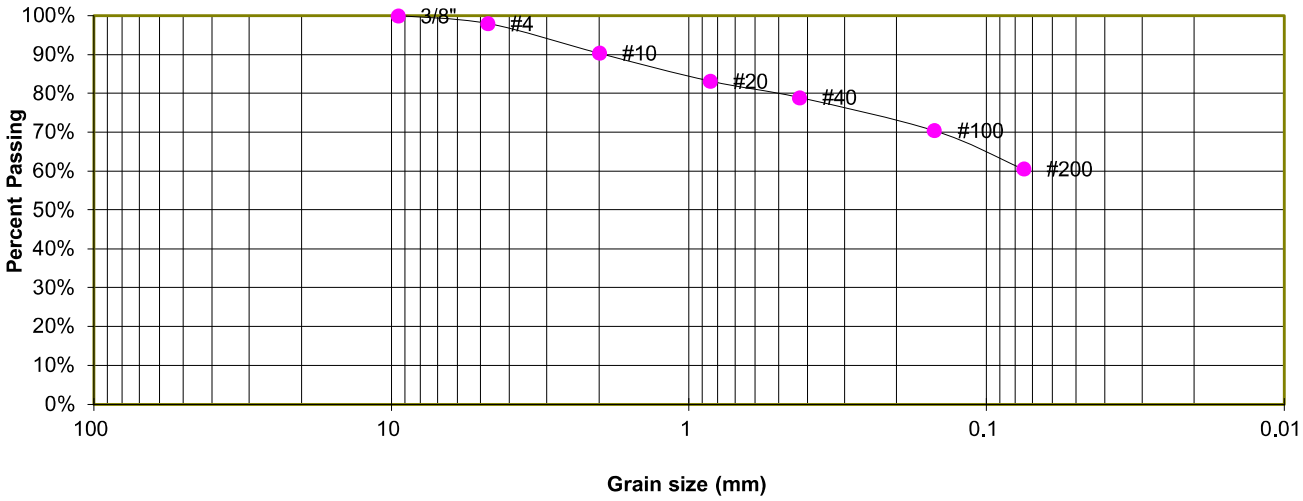
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-4**

| | | | |
|---|---|---|---|
| TEST BORING | 2 | SOIL DESCRIPTION | SILT, SANDY |
| DEPTH (FT) | 15 | USCS CLASSIFICATION | ML |
| SOIL TYPE | 2 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | 100.0% |
| 4 | 98.0% |
| 10 | 90.4% |
| 20 | 83.2% |
| 40 | 79.0% |
| 100 | 70.4% |
| 200 | 60.6% |

| Atterberg Limits | |
|---|---|
| Plastic Limit | 24 |
| Liquid Limit | 36 |
| Plastic Index | 12 |

ENTECH ENGINEERING, INC.

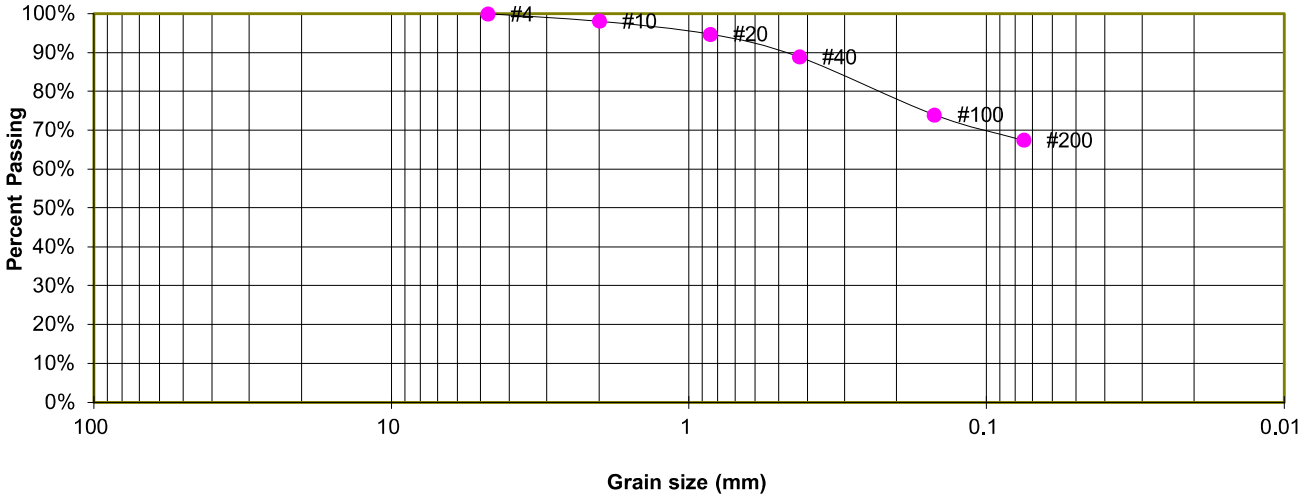
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-5**

| | | | |
|---|---|---|---|
| TEST BORING | 6 | SOIL DESCRIPTION | CLAY, SANDY |
| DEPTH (FT) | 10 | USCS CLASSIFICATION | CL |
| SOIL TYPE | 2 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | |
| 4 | 100.0% |
| 10 | 98.1% |
| 20 | 94.8% |
| 40 | 88.9% |
| 100 | 74.0% |
| 200 | 67.4% |

| Atterberg Limits | |
|---|---|
| Plastic Limit | 23 |
| Liquid Limit | 41 |
| Plastic Index | 18 |

ENTECH ENGINEERING, INC.

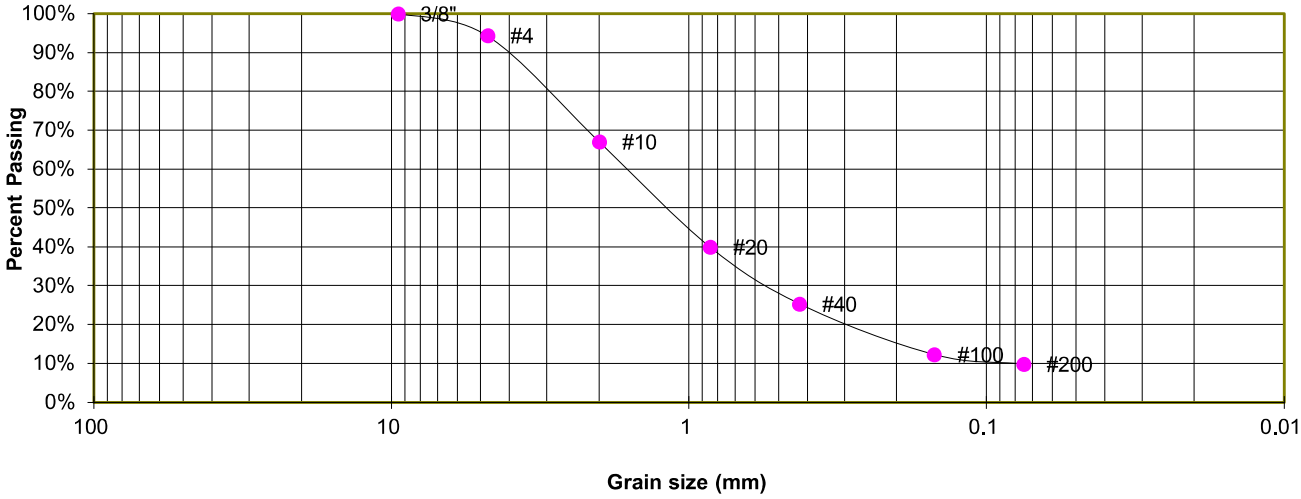
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-6**

| | | | |
|---|---|---|---|
| TEST BORING | 3 | SOIL DESCRIPTION | SANDSTONE, (SAND, WITH SILT) |
| DEPTH (FT) | 15 | USCS CLASSIFICATION | SM-SW |
| SOIL TYPE | 3 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | 100.0% |
| 4 | 94.3% |
| 10 | 67.0% |
| 20 | 40.0% |
| 40 | 25.3% |
| 100 | 12.3% |
| 200 | 9.8% |

**Atterberg Limits**

| | |
|---|---|
| Plastic Limit | NP |
| Liquid Limit | NV |
| Plastic Index | NP |

ENTECH ENGINEERING, INC.

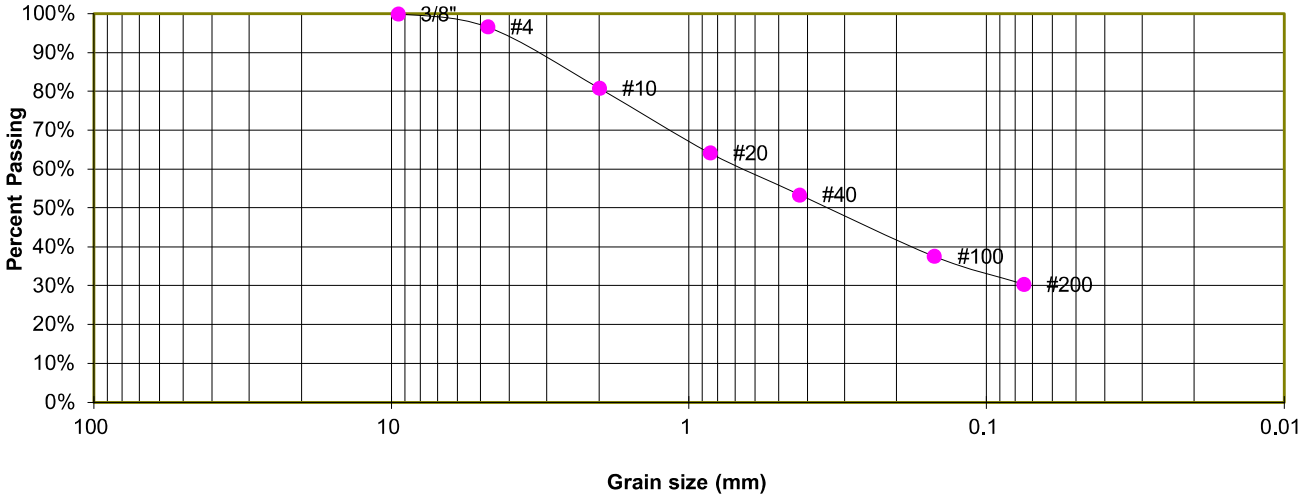
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-7**

| | | | |
|---|---|---|---|
| TEST BORING | 2 | SOIL DESCRIPTION | SANDSTONE, (SAND, CLAYEY) |
| DEPTH (FT) | 20 | USCS CLASSIFICATION | SC |
| SOIL TYPE | 3 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | 100.0% |
| 4 | 96.6% |
| 10 | 80.8% |
| 20 | 64.2% |
| 40 | 53.4% |
| 100 | 37.6% |
| 200 | 30.4% |

**Atterberg Limits**

| | |
|---|---|
| Plastic Limit | 18 |
| Liquid Limit | 30 |
| Plastic Index | 12 |

ENTECH ENGINEERING, INC.

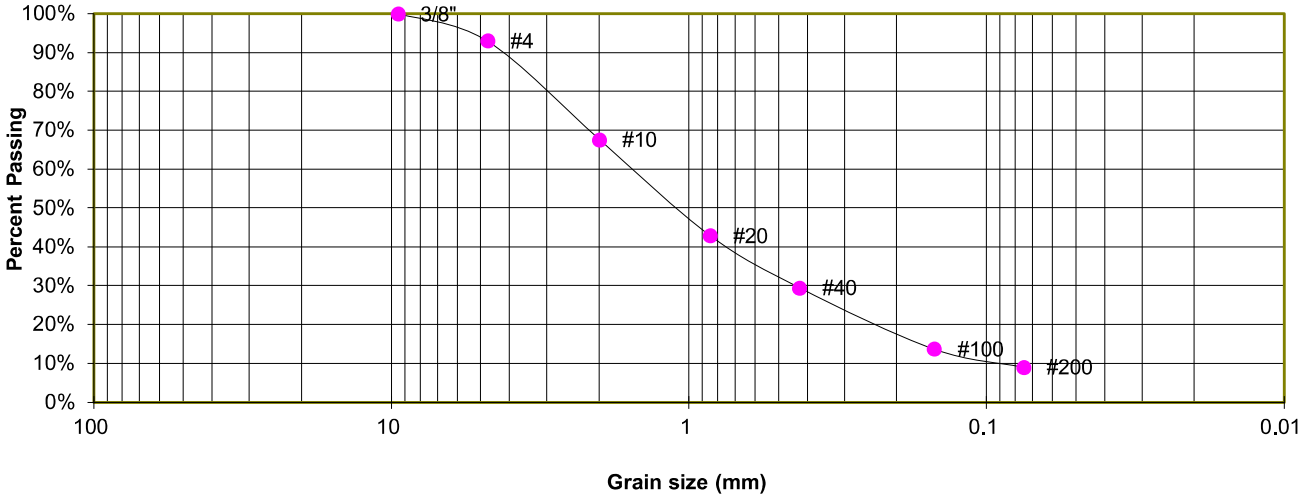
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-8**

| | | | |
|---|---|---|---|
| TEST BORING | 7 | SOIL DESCRIPTION | SANDSTONE, (SAND, WITH SILT) |
| DEPTH (FT) | 15 | USCS CLASSIFICATION | SM-SW |
| SOIL TYPE | 3 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | 100.0% |
| 4 | 93.0% |
| 10 | 67.6% |
| 20 | 43.0% |
| 40 | 29.5% |
| 100 | 13.7% |
| 200 | 9.0% |

**Atterberg Limits**

| | |
|---|---|
| Plastic Limit | NP |
| Liquid Limit | NV |
| Plastic Index | NP |

ENTECH ENGINEERING, INC.

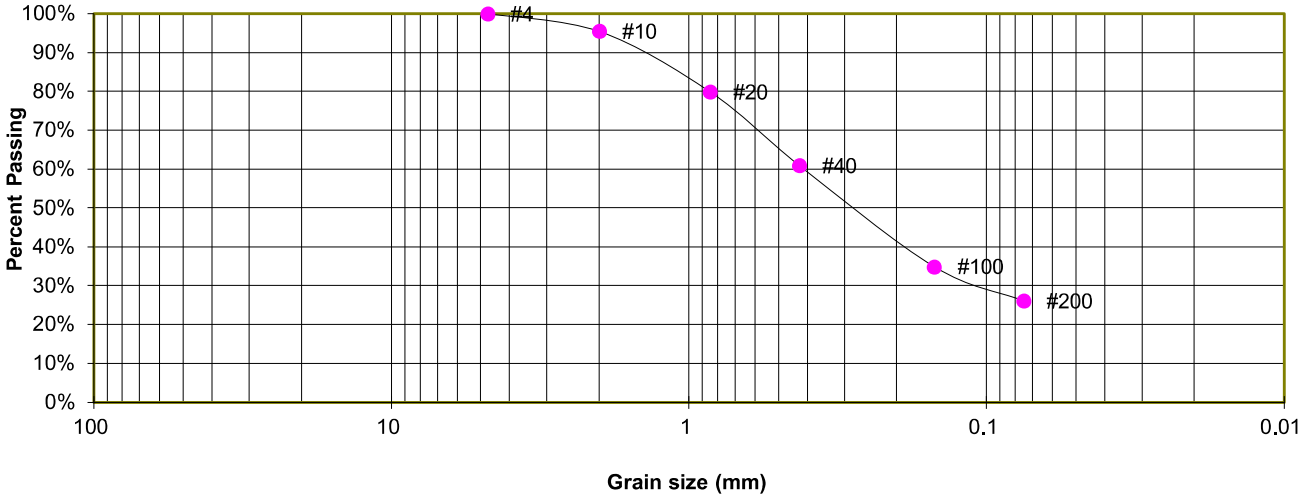
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-9**

| | | | |
|---|---|---|---|
| TEST BORING | 8 | SOIL DESCRIPTION | SANDSTONE, (SAND, SILTY) |
| DEPTH (FT) | 20 | USCS CLASSIFICATION | SM |
| SOIL TYPE | 3 | | |




| U.S. Sieve # | Percent Finer |
|---|---|
| 3" | |
| 1 1/2" | |
| 3/4" | |
| 1/2" | |
| 3/8" | |
| 4 | 100.0% |
| 10 | 95.5% |
| 20 | 79.9% |
| 40 | 60.9% |
| 100 | 34.9% |
| 200 | 26.1% |

ENTECH ENGINEERING, INC.

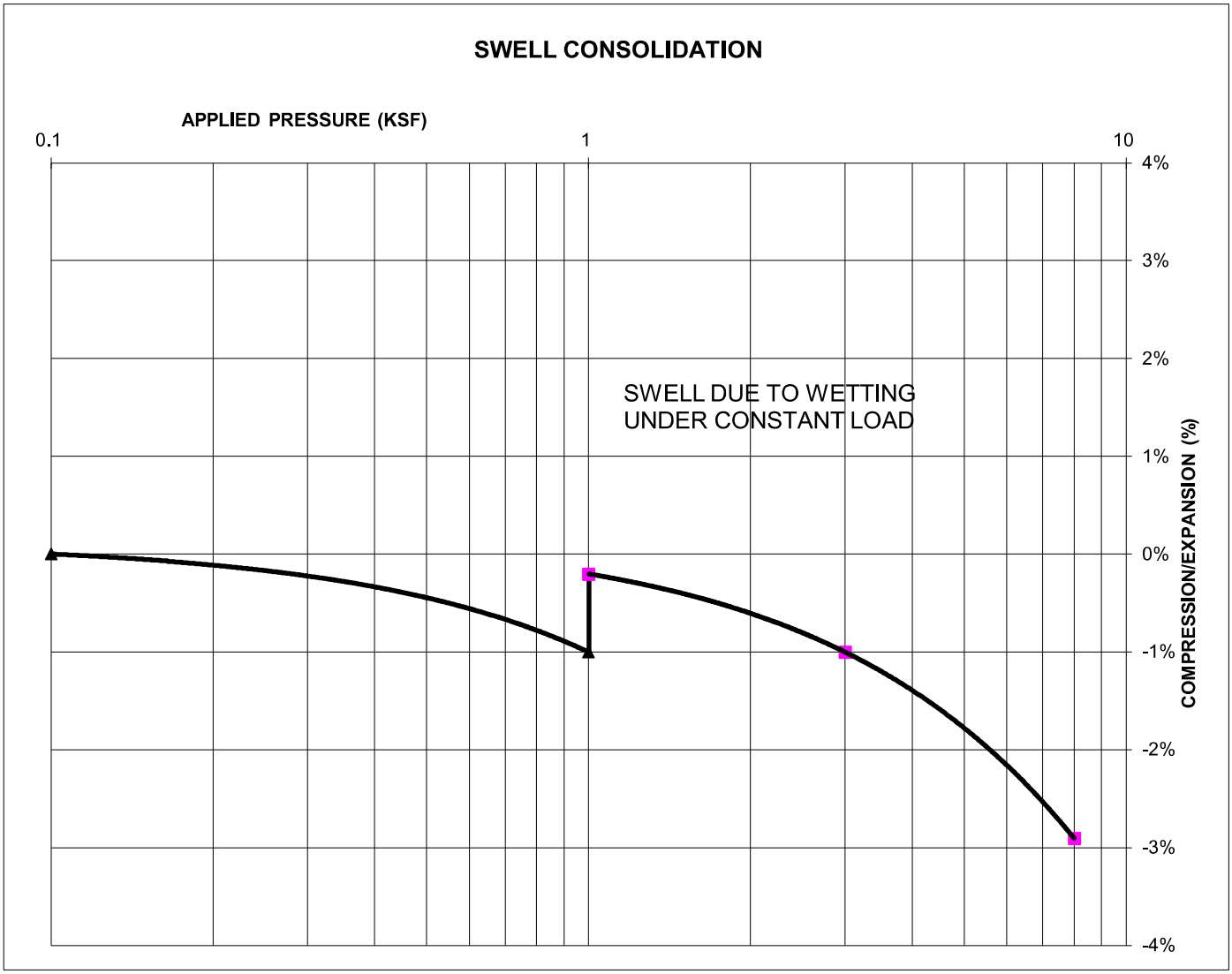
# LABORATORY TEST RESULTS

SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-10**

| | |
|---|---|
| TEST BORING 2 | SOIL DESCRIPTION SILT, SANDY |
| DEPTH (FT) 15 | SOIL TYPE 2 |




**SWELL/CONSOLIDATION TEST RESULTS**

| | |
|---|---|
| NATURAL UNIT DRY WEIGHT (PCF): | 116 |
| NATURAL MOISTURE CONTENT: | 15.0% |
| SWELL/CONSOLIDATION (%): | 0.8% |

ENTECH ENGINEERING, INC.

**LABORATORY TEST RESULTS**

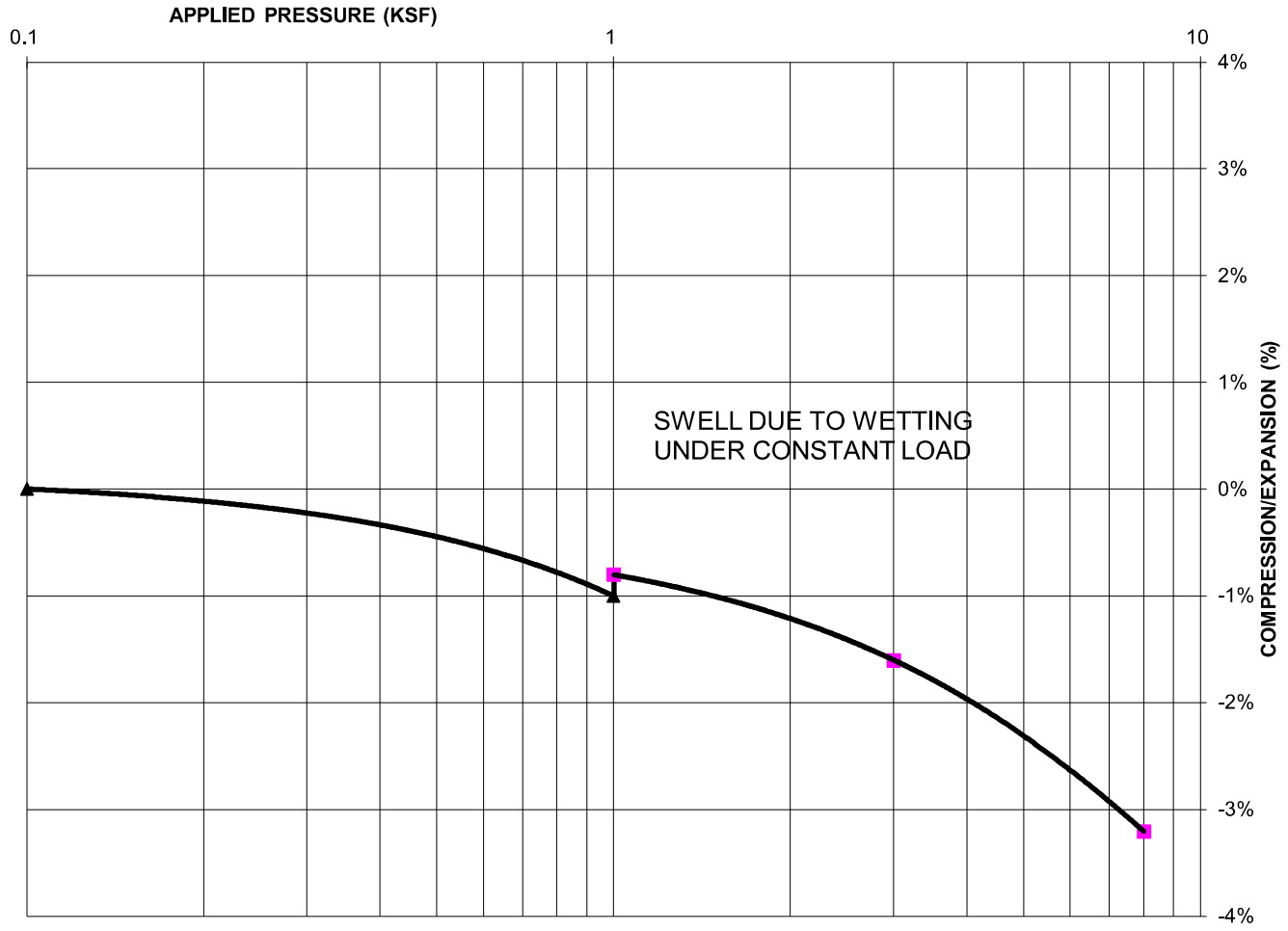
SADDLEHORN, FILING 3
GORILLA CAPITAL

JOB NO. 230509

**FIG. B-11**

| | |
|---|---|
| TEST BORING 2 | SOIL DESCRIPTION SANDSTONE, (SAND, CLAYEY) |
| DEPTH (FT) 20 | SOIL TYPE 3 |

## SWELL CONSOLIDATION




**SWELL/CONSOLIDATION TEST RESULTS**

| | |
|---|---|
| NATURAL UNIT DRY WEIGHT (PCF): | 119 |
| NATURAL MOISTURE CONTENT: | 12.4% |
| SWELL/CONSOLIDATION (%): | 0.2% |

| | | | |
|---|---|---|---|
| CLIENT | GORILLA CAPITAL | JOB NO. | 230509 |
| PROJECT | SADDLEHORN, FILING 3 | DATE | 5/17/2023 |
| LOCATION | SADDLEHORN, FILING 3 | TEST BY | BL |

| BORING NUMBER | DEPTH, (ft) | SOIL TYPE NUMBER | UNIFIED CLASSIFICATION | WATER SOLUBLE SULFATE, (wt%) |
|---|---|---|---|---|
| TB-1 | 2-3 | 2 | CL | <0.01 |
| TB-2 | 15 | 2 | ML | <0.01 |
| TB-2 | 20 | 3 | SC | 0.00 |
| TB-3 | 15 | 3 | SM-SW | 0.00 |
| | | | | |
| | | | | |
| | | | | |
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ENTECH ENGINEERING, INC.

**LABORATORY TEST SULFATE RESULTS**

SADDLEHORN, FILING 3

GORILLA CAPITAL

JOB NO. 230509

**FIG. B-13**

# APPENDIX D: Saddlehorn Ranch Subdivision, Test Boring & Test Pit Logs, Laboratory Testing Summary, Entech Job No. 181823

# TABLE 1

## SUMMARY OF LABORATORY TEST RESULTS FROM TEST BORINGS

CLIENT WILLIAM GUMAN
PROJECT CURTIS AND JUDGE ORR
JOB NO. 181823

| SOIL TYPE | TEST BORING 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 | 2-3 | | | 12.0 | NV | NP | <0.01 | | | SM | SAND, SILTY |
| 1 | 2 | 5 | | | 13.8 | | | | | | SM | SAND, SILTY |
| 1 | 4 | 2-3 | | | 3.2 | | | | | | SW | SAND |
| 3 | 3 | 10 | | | 12.9 | NV | NP | <0.01 | | | SM | SANDSTONE, SILTY |
| 4 | 4 | 20 | 21.4 | 104.2 | 52.5 | NV | NP | <0.01 | | 0.0 | ML | SILTSTONE, VERY SANDY |

# TABLE 2

## SUMMARY OF LABORATORY TEST RESULTS FROM TEST PITS

CLIENT GUMAN AND ASSOCIATES
PROJECT CURTIS RD AND JUGRE ORR RD
JOB NO. 181823

| SOIL TYPE | 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 | 2 | 2-3 | | | 7.6 | | | | | | SM-SW | SAND, SLIGHTLY SILTY |
| 1 | 3 | 5-6 | | | 9.8 | | | | | | SM-SW | SAND, SLIGHTLY SILTY |
| 1 | 6 | 4-6 | | | 5.5 | | | | | | SM-SW | SAND, SLIGHTLY SILTY |
| 1 | 9 | 2-3 | | | 26.5 | 24 | 9 | | | | SC | SAND, CLAYEY |
| 1 | 11 | 5-6 | | | 10.4 | | | | | | SM-SW | SAND, SLIGHTLY SILTY |
| 1 | 12 | 2-3 | | | 6.6 | | | | | | SM-SW | SAND, SLIGHTLY SILTY |
| 1 | 13 | 5-6 | | | 30.3 | 25 | 11 | | | | SC | SAND, CLAYEY |
| 1 | 15 | 2-3 | | | 27.5 | | | | 820 | | SC | SAND, CLAYEY |
| 1 | 18 | 5-6 | | | 1.6 | | | | | | SW | SAND |
| 1 | 21 | 5-6 | | | 23.4 | | | | | | SC | SAND, CLAYEY |
| 1 | 37 | 6-7 | | | 30.1 | 19 | 3 | | 430 | | SM | SAND, SILTY |
| 1 | 31 | 2-3 | | | 16.6 | | | | | | SM | SAND, SILTY |
| 1 | 32 | 4-5 | | | 44.3 | | | | | | SC | SAND, VERY CLAYEY |
| 1 | 33 | 2-3 | | | 4.3 | | | | | | SW | SAND |
| 1 | 35 | 5-6 | | | 2.2 | | | | | | SW | SAND |
| 1 | 36 | 2-3 | | | 8.2 | | | | | | SM-SW | SAND, SLIGHTLY SILTY |
| 1 | 38 | 2-3 | | | 3.1 | | | | | | SW | SAND |
| 1 | 39 | 5-6 | | | 12.4 | | | | | | SM | SAND, SILTY |
| 2 | 1 | 7-8 | | | 70.3 | 49 | 31 | | 1360 | | CL | CLAY, SANDY |
| 2 | 4 | 2-3 | | | 56.4 | 26 | 12 | | | | CL | CLAY, VERY SANDY |
| 2 | 5 | 7-8 | | | 69.6 | 32 | 19 | | 880 | | CL | CLAY, SANDY |
| 2 | 16 | 7-8 | | | 92.9 | | | | 4420 | | CL | CLAY, SANDY |
| 3 | 8 | 4-5 | | | 44.8 | 29 | 13 | | | | SC | SANDSTONE, VERY CLAYEY |
| 3 | 10 | 5-6 | | | 16.6 | | | | | | SM | SANDSTONE, SILTY |
| 3 | 17 | 5-6 | | | 12.6 | | | | | | SM | SANDSTONE, SILTY |
| 3 | 34 | 5-6 | | | 16.9 | | | | | | SM | SANDSTONE, SILTY |
| 3 | 40 | 5-6 | | | 13.9 | | | | | | SM | SANDSTONE, SILTY |
| 4 | 7 | 6-7 | | | 91.8 | | | | 2300 | | CL | CLAYSTONE, SANDY |
| 4 | 14 | 4-5 | | | 76.1 | 47 | 23 | | 3160 | | CL | CLAYSTONE, SANDY |
| 4 | 23 | 5-6 | | | 57.0 | | | | 450 | | CL | CLAYSTONE, VERY SANDY |

TEST BORING NO. 3
DATE DRILLED 4/2/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|---|
| WATER @ 12', 4/3/19 | | | | | | |
| 6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, DENSE TO MEDIUM DENSE, MOIST TO WET | | | | 44 | 7.3 | 1 |
| | 5 | | | 41 | 8.6 | 1 |
| SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, WET ▼ | 10 | | | 50/9" | 11.8 | 3 |
| | 15 | | | 50/8" | 11.7 | 3 |
| | 20 | | | 50/6" | 14.8 | 3 |

TEST BORING NO. 4
DATE DRILLED 4/2/2019
CLIENT WILLIAM GUMAN
LOCATION CURTIS AND JUDGE ORR

| REMARKS | Depth (ft) | Symbol | Samples | Blows per foot | Watercontent % | Soil Type |
|---|---|---|---|---|---|---|
| WATER @ 14', 4/3/19 | | | | | | |
| 6" TOPSOIL, SAND, CLEAN TO SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO DENSE, MOIST | | | | 7 | 2.6 | 1 |
| | 5 | | | 10 | 2.3 | 1 |
| | 10 | | | 30 | 4.0 | 1 |
| ▼ SILTSTONE, VERY SANDY, DARK GRAY, HARD, WET | 15 | | | 32 | 9.6 | 1 |
| | 20 | | | 50/4" | 21.3 | 4 |

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 4/12/19 |

JOB NO.: 181823
FIG NO.: B-2

TEST PIT NO. 25
DATE EXCAVATED 1/23/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil loamy sand, brown | | | | | | |
| loamy sand to sand, fine to medium grained, light brown | 1–10 | | | sg | | 1 |

TEST PIT NO. 26
DATE EXCAVATED 1/23/2019
CLIENT GUMAN AND ASSOCIATES, LTD
LOCATION CURTIS ROAD AND JUDGE ORR ROAD

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil loamy sand, brown | | | | | | |
| loamy sand, fine to coarse grained, light brown | 1–2 | | | sg | | 1 |
| sandy clay loam, fine to coarse grained, light brown | 3 | | | gr | w | 3A |
| sand, fine to coarse grained | 4–10 | | | sg | | 1 |

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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COLORADO SPRINGS, COLORADO 80907

**TEST PIT LOG**

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 2/11/19 |

JOB NO.: 181823
FIG NO.: B-15

TEST PIT NO. 27
DATE EXCAVATED 1/23/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, light brown | 2 | | | gr | w | 2A |
| loamy sand to sand, fine to coarse grained, tan | 3 | | | sg | | 1 |
| | 4 | | | | | |
| | 5 | | | | | |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 10 | | | | | |

TEST PIT NO. 28
DATE EXCAVATED 1/23/2019
CLIENT GUMAN AND ASSOCIATES, LTD
LOCATION CURTIS ROAD AND JUDGE ORR ROAD

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, light brown | 2 | | | gr | w | 2A |
| sand, fine to coarse grained, tan | 3 | | | sg | | 1 |
| *-groundwater at 6.5' | 4 | | | | | |
| | 5 | | | | | |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 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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COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 2/16/19 |

JOB NO.: 181823
FIG NO.: B-16

TEST PIT NO. 31
DATE EXCAVATED 1/4/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, ligth brown | 2 | | | gr | w | 2A |
| loamy sand, fine to medium grained, tan | 3 | | | sg | | 1 |
| | 4 | | | | | |
| | 5 | | | | | |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 10 | | | | | |

TEST PIT NO. 32
DATE EXCAVATED 1/4/2019
CLIENT GUMAN AND ASSOCIATES, LTD
LOCATION CURTIS ROAD AND JUDGE ORR ROAD

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, light brown | 2 | | | gr | w | 2A |
| sandy clay loam, gray brown | 3 | | | gr | w | 3A |
| | 4 | | | | | |
| | 5 | | | | | |
| | 6 | | | | | |
| weathered sandy claystone, gray brown | 7 | | | ma | | 4A |
| | 8 | | | | | |
| | 9 | | | | | |
| | 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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COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 2/16/19 |

JOB NO.: 181823
FIG NO.: B-18

TEST PIT NO. 33
DATE EXCAVATED 1/4/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, tan | 2 | | | gr | w | 2A |
| gravelly loamy sand, tan | 3 | | | sg | | 1 |
| *-groundwater at 7.5' | 4 | | | | | |
| | 5 | | | | | |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 10 | | | | | |

TEST PIT NO. 34
DATE EXCAVATED 1/4/2019
CLIENT GUMAN AND ASSOCIATES, LTD
LOCATION CURTIS ROAD AND JUDGE ORR ROAD

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, tan | 2 | | | gr | w | 2A |
| | 3 | | | | | |
| | 4 | | | | | |
| weathered silty sandstone, fine to coarse grained, tan | 5 | | | ma | | 3A |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 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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COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 2/11/19 |

JOB NO.: 181823
FIG NO.: B-19

TEST PIT NO. 35
DATE EXCAVATED 1/4/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, tan | 2 | | | gr | w | 2A |
| | 3 | | | | | |
| | 4 | | | | | |
| gravelly loamy sand, fine to coarse grained, tan | 5 | | | sg | | 1 |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 10 | | | | | |

TEST PIT NO. 36
DATE EXCAVATED 1/4/2019
CLIENT GUMAN AND ASSOCIATES, LTD
LOCATION CURTIS ROAD AND JUDGE ORR ROAD

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| sandy loam, fine to coarse grained, tan | 2 | | | gr | w | 2A |
| | 3 | | | | | |
| | 4 | | | | | |
| | 5 | | | | | |
| sandy clay loam, gray | 6 | | | gr | w | 3A |
| *-signs of seasonal occuring groundwater at 6' | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 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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COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 2/16/19 |

JOB NO.: 181823
FIG NO.: B-20

TEST PIT NO. 41
DATE EXCAVATED 5/6/2019
Job # 181823

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| loamy sand, fine to coarse grained, tan | 2 | | | sg | | 1 |
| | 3 | | | | | |
| sandy clay, gray brown | 4 | | | gr | m | 4 |
| | 5 | | | | | |
| | 6 | | | | | |
| | 7 | | | | | |
| | 8 | | | | | |
| | 9 | | | | | |
| | 10 | | | | | |

TEST PIT NO. 42
DATE EXCAVATED 5/6/2019
CLIENT GUMAN AND ASSOCIATES, LTD
LOCATION CURTIS ROAD AND JUDGE ORR ROAD

| REMARKS | Depth (ft) | Symbol | Samples | Soil Structure Shape | Soil Structure Grade | USDA Soil Type |
|---|---|---|---|---|---|---|
| topsoil sandy loam, brown | 1 | | | | | |
| loamy sand, fine to coarse grained, tan | 2 | | | sg | | 1 |
| | 3 | | | | | |
| | 4 | | | | | |
| | 5 | | | | | |
| | 6 | | | | | |
| weathered sandy claystone, gray brown | 7 | | | ma | | 4A |
| | 8 | | | | | |
| | 9 | | | | | |
| | 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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COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

| DRAWN: | DATE: | CHECKED: | DATE: |
|---|---|---|---|
| | | LLL | 7/2/19 |

JOB NO.: 181823
FIG NO.: 2

# APPENDIX E: Soil Survey Descriptions

# El Paso County Area, Colorado

## 8—Blakeland loamy sand, 1 to 9 percent slopes

### Map Unit Setting

*National map unit symbol:* 369v
*Elevation:* 4,600 to 5,800 feet
*Mean annual precipitation:* 14 to 16 inches
*Mean annual air temperature:* 46 to 48 degrees F
*Frost-free period:* 125 to 145 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Blakeland and similar soils:* 98 percent
*Minor components:* 2 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Blakeland

#### Setting

*Landform:* Flats, hills
*Landform position (three-dimensional):* Side slope, talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

#### Typical profile

*A - 0 to 11 inches:* loamy sand
*AC - 11 to 27 inches:* loamy sand
*C - 27 to 60 inches:* sand

#### Properties and qualities

*Slope:* 1 to 9 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat excessively drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 5 percent
*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3e
*Land capability classification (nonirrigated):* 6e
*Hydrologic Soil Group:* A
*Ecological site:* R049XB210CO - Sandy Foothill
*Hydric soil rating:* No

**Minor Components**

**Other soils**

*Percent of map unit:* 1 percent
*Hydric soil rating:* No

**Pleasant**

*Percent of map unit:* 1 percent
*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

# El Paso County Area, Colorado

## 19—Columbine gravelly sandy loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 367p
*Elevation:* 6,500 to 7,300 feet
*Mean annual precipitation:* 14 to 16 inches
*Mean annual air temperature:* 46 to 50 degrees F
*Frost-free period:* 125 to 145 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Columbine and similar soils:* 97 percent
*Minor components:* 3 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Columbine

#### Setting

*Landform:* Fans, fan terraces, flood plains
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium

#### Typical profile

*A - 0 to 14 inches:* gravelly sandy loam
*C - 14 to 60 inches:* very gravelly loamy sand

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 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:* Very low (about 2.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 4e
*Land capability classification (nonirrigated):* 6e
*Hydrologic Soil Group:* A
*Ecological site:* R049XY214CO - Gravelly Foothill
*Hydric soil rating:* No

### Minor Components

#### Fluvaquentic haplaquolls

*Percent of map unit:* 1 percent

*Landform:* Swales
*Hydric soil rating:* Yes

**Other soils**
*Percent of map unit:* 1 percent
*Hydric soil rating:* No

**Pleasant**
*Percent of map unit:* 1 percent
*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

# El Paso County Area, Colorado

## 29—Fluvaquentic Haplaquolls, nearly level

### Map Unit Setting

*National map unit symbol:* 3681
*Elevation:* 5,000 to 7,800 feet
*Mean annual precipitation:* 13 to 15 inches
*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 110 to 165 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Fluvaquentic haplaquolls and similar soils:* 98 percent
*Minor components:* 2 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Fluvaquentic Haplaquolls

#### Setting

*Landform:* Marshes, flood plains, swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium

#### Typical profile

*A - 0 to 12 inches:* variable
*C - 12 to 60 inches:* stratified very gravelly sand to loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 6.00 in/hr)
*Depth to water table:* About 0 to 24 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R067BY029CO - Sandy Meadow
*Hydric soil rating:* Yes

**Minor Components**

**Haplaquolls**
*Percent of map unit:* 1 percent
*Landform:* Domes
*Hydric soil rating:* Yes

**Other soils**
*Percent of map unit:* 1 percent
*Hydric soil rating:* No

# Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 20, Sep 2, 2022

# APPENDIX F: Entech Engineering, Inc. Response to Colorado Geological Survey Review Comments dated April 26, 2023

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

April 26, 2023

Gorilla Capital, LLC
1342 High Street
Eugene Oregon, 97401

Attn: John Helmick

Re: Response to Colorado Geological Survey Review
Saddlehorn Ranch Filing No. 3
El Paso County, Colorado

Ref: Entech Engineering, Inc., Soil, Geology, Geologic Hazard, & Wastewater Study – Saddlehorn Ranch Subdivision, El Paso County, Colorado. Revised date April 24, 2020, Entech Job No. 181823

Entech Engineering, Inc., Soil, Geology, Geologic Hazard, & Wastewater Study – Saddlehorn Ranch Filing No. 3, El Paso County, Colorado. Revised date November 15, 2022, Entech Job No. 222005

Colorado Geological Survey Review March 16, 2023. Saddlehorn Ranch Filing 3, El Paso County Fil No. SF234, CGS Unique No. EP-19-0140_5

Dear Mr. Helmick:

This letter is written in response to the Colorado Geological Survey (CGS), March 16, 2023, review letter concerning the Geologic Hazard Study's for the above referenced sites. This letter includes responses to the comments, and figures associated appendices as referenced below.

**CGS COMMENTS AND ENTECH ENGINEERING, INC. RESPONSES**

**CGS Comment**: *"CGS recommends the county require groundwater monitoring/observation to verify that proposed floor levels are at least three feet (preferably 5 feet) above maximum anticipated groundwater levels and maintained year-round."*

**Entech Response**: Entech has included an overall site plan with test boring locations from previous site investigations beginning in the Spring of 2019, which is presented on Figure 1 included with this letter. Additionally, lots potentially impacted by the shallow groundwater are indicated on the Geology/Engineering Geology Map completed for Filing No. 3 presented on Figure 2. Lots that are potentially impacted within Filing No. 3 include: 1 to 13, 23 to 25, 28 to 33, 38, and 39. Due to the lot sizes we anticipate that areas may be located on the lots with deeper water. The lots identified with potentially shallow water will require additional investigation prior to construction. A plat note regarding the lots affected by shallow water is presented below.

> Shallow water (6 feet) was encountered in preliminary studies on lots 2,7,14,18,21,25,30 and 39. Structures should be constructed a minimum of 3 feet above water levels. Lots 1, 3 to 6,8,11,23,24,28,29,31,32,33 and 38 are adjacent to the lots with shallow water. Due to the sizes of the lots, areas with deeper water which are suitable for below grade construction are likely to be available. Investigation on each lot is recommended prior to construction on all of the lots to determine soils conditions and determine depths to water.

Gorilla Capital, LLC
Response to Colorado Geological Survey Review
Saddlehorn Ranch Filing No. 3
El Paso County, Colorado

**CGS Comment**: *"As perched water conditions can be encountered anywhere within the site, CGS recommends that the drain systems (perimeter, underslab, interceptor, ect.) presented by Entech on p. 10 of their November 15, 2022 reports should be required for all lots within Filing No. 3 unless it can be proven with a groundwater monitoring program that the below grade areas (basements or storage areas) will be maintaining 3 to 5 feet above the highest expected groundwater elevations and/ or perched groundwater locations."*

**Entech Response**: Foundations should be kept as shallow as possible in areas of shallow groundwater (6 feet or less). Due to the size of the lots, areas with deeper water which are suitable for below grade construction are likely to be available. Additional investigation of the lots will be required to further delineate shallow groundwater impact areas prior to construction. Site specific soil and foundation investigations, and tactile test pit evaluations for Onsite Wastewater systems will be required for each lot prior to construction. Perimeter foundation drains will be required on all lots with usable space below grade. Interceptor or underslab drains should be determined by lot by lot investigations. These additional drains should be installed as needed.

We trust this has provided you with the information you required. In summary, based on the analysis of this site, the proposed development meets stability requirements. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

LLL
Entech Job No. 230509

230509 cgs response 4/21/2023

Reviewed by:

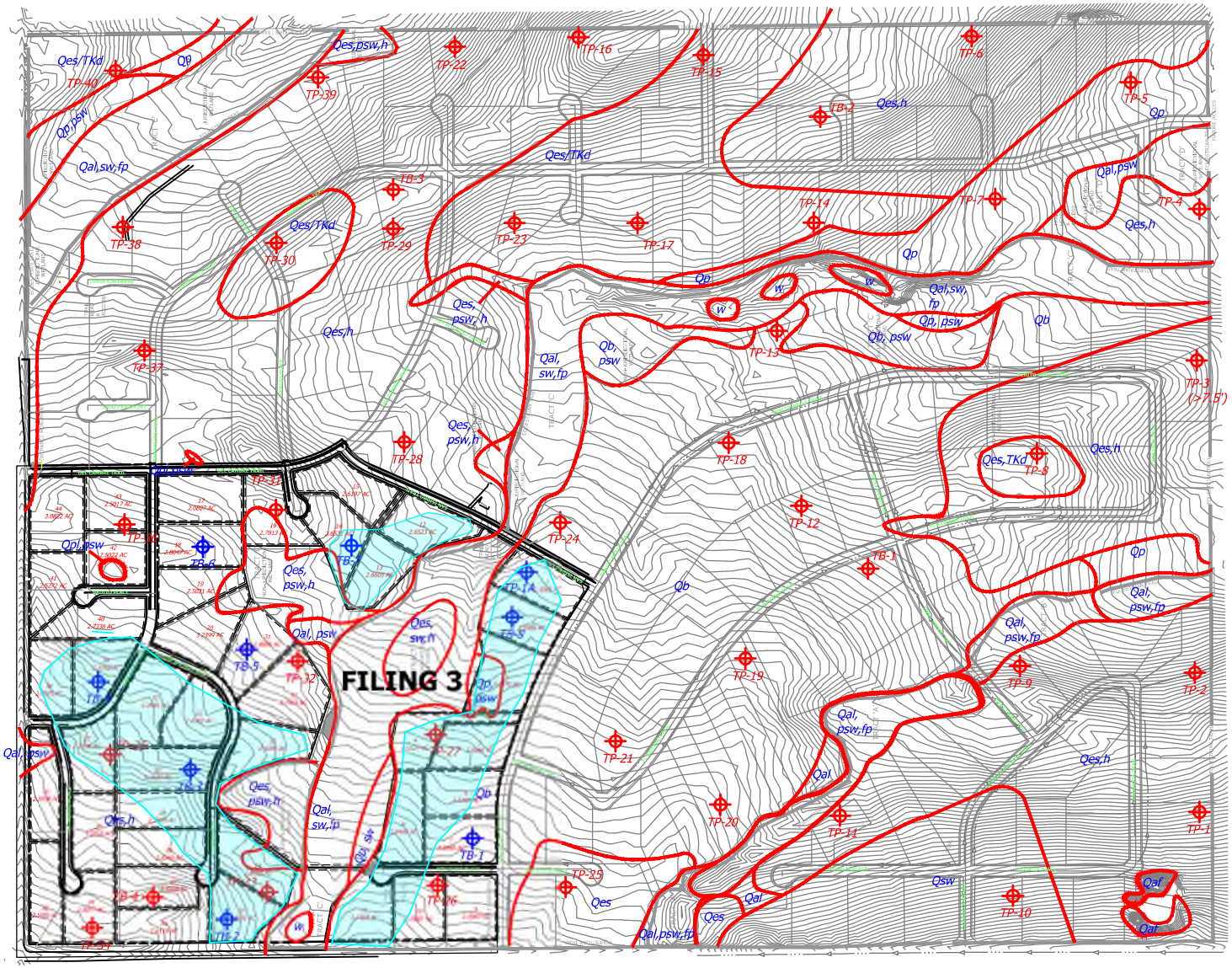
Joseph C. Goode, Jr., P.E.
President

## SADDLEHORN RANCH FILING NO. 3
**GROUNDWATER SUMMARY**
**GORILLA CAPITAL, LLC**
**ENTECH JOB NO. 230509**

| Test Boring No. | Depth to Bedrock (ft) | Depth to Groundwater (ft) Date Meausured | |
|---|---|---|---|
| Entech Job No. 181823 | | | |
| TB-4 | 15 | 14 (4/3/19) | |
| Entech Job No. 222005 | | | |
| TB-1 | 17 | 8 (10/6/2022) | 7.75 (4/20/2023) |
| TB-2 | 17 | 6 (10/6/2022) | 4.5* (4/20/2023) |
| TB-3 | 11 | 6 (10/6/2022) | 5.5 (4/20/2023) |
| TB-4 | 11 | 6 (10/6/2022) | 3.5* (4/20/2023) |
| TB-5 | 14 | >20 (10/6/2022) | 6** (4/20/2023) |
| TB-6 | 13 | 9 (10/6/2022) | 10.75 (4/20/2023) |
| TB-7 | 3 | 14.5 (10/6/2022) | 3.5 (4/20/2023) |
| TB-8 | 17 | 6 (10/6/2022) | 6.5* (4/20/2023) |

* - boring caved, wet
** - boring caved, dry

| Test Pit No. | USDA Soil Type | LTAR Value | Depth to Bedrock (ft) | Groundwater (ft) |
|---|---|---|---|---|
| Entech Job No. 181823 | | | | |
| TP-26 | 3A* | 0.3 | >8 | N/A |
| TP-27 | 2A | 0.5 | >8 | N/A |
| TP-31 | 2A | 0.5 | >8 | N/A |
| TP-32 | 4A* | 0.15 | 6 | N/A |
| TP-33 | 2A | 0.5 | >8 | 7.5 |
| TP-34 | 3A* | 0.3 | 4.5 | N/A |
| TP-35 | 2A | 0.5 | >8 | N/A |
| TP-36 | 3A* | 0.3 | >8 | 6 |
| TP-41 | 4* | 0.2 | >8 | N/A |
| TP-42 | 4A* | 0.15 | 6 | N/A |
| Entech Job No. 222005 | | | | |
| TP-1A | 4A* | 0.15 | >8 | 7.5 |




LEGEND:

- Qaf - Artificial Fill of Holocene Age: man made fill deposits
- Qal - Post Piney Creek (Alluvium One)-Recent Alluvium of Late Holocene Age: recent stream desposits
- ($Qa_1$)
- Qpl - Playa Deposits of Holocene Age: blowouts in eolian sand that form seasonal ponds
- Qp - Piney Creek Alluvium (Alluvium Two) of Early Holocene Age:
- ($Qa_2$) low stream terrace deposits above current stream channels
- Qb - Broadway Alluvium (Alluvium Three) of Late Pleistocene Age:
- ($Qa_3$) stream terrace deposited sands
- Qes - Eolian Sand of Holocene to Late Pleistocene Age: wind blown sand deposits
- Qsw - Sheetwash of Holocene to Late Pleistocene Age: silty to clayey sand sheetwash deposits
- Qes/TKd - Sand Deposits of Quaternary Age Overlying Dawson Arkose Formation of Tertiary to Cretaceous Age: windblown sands and residual soil deposits overlying arkosic sandstone with interbedded siltstone and claystone
- h - hydrocompaction
- fp - floodplain
- psw - potentially seasonal shallow groundwater area
- sw - seasonal shallow groundwater area
- w - flowing / ponded water

- TB- APPROXIMATE TEST BORING LOCATION AND NUMBER
- TP- APPROXIMATE TEST PIT LOCATION AND NUMBER
- TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (EEI JOB NO. 181823)
- TP- APPROXIMATE TEST PIT LOCATION AND NUMBER (EEI JOB NO. 181823)

| REVISION | BY |
|---|---|
| | |

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

# GEOLOGY/ENGINEERING GEOLOGY MAP
SADDLEHORN RANCH FILING NO. 3
CURTIS ROAD AND JUDGE ORR ROAD
EL PASO COUNTY, CO.
FOR: WILLIAM GUMAN AND ASSOCIATES, LTD

DRAWN LLL
CHECKED
DATE 10/31/22
SCALE AS SHOWN
JOB NO. 222005
FIGURE No. 1