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

August 15, 2025
Revised May 11, 2026

Lions Den Trust
1339 South Voyager Parkway, Suite 130
Colorado Springs, CO 80921

Attn: Lance Klug

Re: OWTS – Wastewater Study
12120 Casey Lane – 7-Lot Subdivision
Parcel No. 62130-00-006
El Paso County, Colorado
Entech Job No. 213150

Dear Mr. Klug:

The project consists of subdividing 35.955-acres into seven rural residential lots. The site is located southwest of the intersection of Shoup Road and Casey Lane in the northern portion of El Paso County, Colorado.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the NW¼ of Section 13 Township 12 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located southwest of the intersection of Shoup Road and Casey Lane in the northern portion of El Paso County, Colorado. The location of the site is as shown in the Vicinity Map, Figure 1.

The topography of the site is generally gradually to moderately sloping to the south-southwest, with steeper slopes along the drainage located in the central and southwestern portions of the site. A tributary of Kettle Creek is located in the central and southwestern portions of the site. Several minor drainage swales were observed across the site. The drainages on the site flow in a southerly direction. Water was observed flowing in the tributary, and the minor drainage swales were dry at the time of our site investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included agricultural and rural residential. The site contains field grasses, weeds, kinnikinic, and Ponderosa Pines. Site photographs were taken and original site mapping was completed on December, 23, 2021. The site was revisited on July 25, 2025 to confirm previous mapping and updated site photographs are included in Appendix A. Test pit excavations were completed on January 18, 2022. Test Borings were drilled on January 19, 2022.

The project consists of 35.955-acres. Seven rural residential lots are proposed for the replat. The new lots will be serviced by an individual wells and on-site wastewater treatment systems. The existing residence, detached garage, an old ranch house, and a barn located on Lot 5 will remain. This house is currently on an existing onsite wastewater treatment system. The Site Plan with the proposed replat 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 potentially expansive soils, potentially unstable slopes, potential seasonally and seasonally shallow groundwater, and the potential for elevated radon levels. Based on the

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 was completed. Detailed site-specific mapping was 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 August 19, 2024. The site was revisited on July 25, 2025 to confirm previous mapping.

Two test borings were drilled, and three test pits were excavated on the site to determine general suitability of the soil characteristics for residential construction. The test borings were drilled in the potential house locations. The locations of the test borings/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.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 1, Figure 4), previously the Soil Conservation Service (Reference 2) has mapped two soil types on the site. Complete descriptions of the soil type are presented in Appendix D. In general, the soils consist of sandy loam to loam. The soils are described as follows:

Type	Description
40	Kettle gravelly loamy sand, 3 – 8% Slopes
41	Kettle gravelly loamy sand, 8 – 40% Slopes

The soils have been described to have moderate to 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 2).

Soils

The soils encountered in the Test Borings and Test Pits can be grouped into three general soil types: Type 1: silty to slightly silty sand (SM, SM-SW), Type 2: clayey to very clayey sandstone and silty to slightly silty sandstone (SC, SC-CL, SM-SW, SM), and Type 3: sandy claystone (CL). Bedrock was encountered at depths ranging from 1 to 2 feet in the Test Borings and Test Pits, bedrock was not encountered in Test Pit No. 3. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 is a silty to slightly silty sand (SM, SM-SW). Soil type one was encountered at the existing surface grade in all of the test borings and test pits extending to depths ranging from 1 to 2 feet, and to the termination of Test Pit No. 3 (8 feet). These soils were encountered at medium dense states and moist conditions. Samples tested had approximately 9 percent of the soil sized particles passing the No. 200 Sieve.

Soil Type 2 is a clayey to very clayey sandstone and silty to slightly silty sandstone (SC, SC-CL, SM-SW, SM). Soil type two was both of the test borings, and two of the test pits at depths ranging from 1 to 2 feet bgs and extended to depths ranging from 9 feet bgs to the termination of the test borings and test pits (3 to 15 feet). These soils were encountered at dense to very dense states and moist conditions. Samples tested had approximately 8 to 50 percent of the soil sized particles passing the No. 200 Sieve.

Soil Type 3 is a sandy claystone (CL). Soil Type three was encountered both of the test borings at depths ranging from 4 to 9 feet bgs and extended to depths ranging from 9 feet to the termination of the test boring (15 feet). These soils were encountered at hard consistencies and at moist conditions. Samples tested had approximately 68 to 84 of the soil sized particles passing the No. 200 Sieve. Swell/Consolidation Testing resulted in a volume change of 0.1 percent, indicated a low expansion potential. Highly expansive claystone is common in the area.

Groundwater

Groundwater was not encountered during or subsequent to drilling in the test borings which were drilled to depths of 20 feet. Signs of seasonally occurring groundwater were not observed in the test pits which were excavated to depths of 8 feet. Groundwater is not anticipated to affect shallow foundations on the site. The drainages in the northeastern and southwestern portions property have been identified as a potential seasonally shallow and seasonally shallow groundwater areas, and are 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.

Geology

Approximately 9.5 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 3). 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 expansive claystone and siltstone.

The geology of the site was evaluated using the *Geologic Map of the Black Forest Quadrangle,* by Thorson and Madole in 2003, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. Three mappable units were identified on this site which are described as follows:

Qal **Recent Alluvium of Holocen Age:** These are recent stream deposits in the channels of the main drainage on site. Some areas have recent sand deposition, while others have highly organic soils.

Qp_1 **Younger Piedmont-Slope Alluvium of Holocene and late Pleistocene Age:** These are sheetwash and stream deposited sands and gravels associated with piedmont slope deposits.

Tkd **Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of a thin layer of residual soils overlying the bedrock materials on-site. 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 4, Figure 5), The *Geologic Map of the Colorado Springs-Castle Rock Area,* distributed by the US Geological Survey in 1979 (Reference 5), and the *Geologic Map of the Denver 1° x 2° Quadrangle,* distributed by the US Geological Survey in 1981 (Reference 6). The test borings were used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

Drainage and Floodplain Areas – Constraint

The site is not mapped within any floodplains according to the FEMA Map No. 08041CO315G, dated December 7, 2018 (Figure 7, Reference 7). However, a physiographic floodplain has been mapped along the main drainage located in the central and southwestern portions of the site. Additionally, areas of seasonal and potentially seasonal shallow groundwater were mapped on the site (Figure 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These areas lie within low-lying areas and along the minor drainage swales in the southeastern and eastern portions of the site. Water was observed in the main drainage, and water was not observed in the minor drainage swales at time of our site investigation. These areas can likely be avoided or properly mitigated by development. The potential exists for high groundwater levels during high moisture periods and should structures encroach on these areas the following precautions should be followed. Exact locations of floodplain and specific drainage studies are beyond the scope of this report.

ON-SITE WASTEWATER TREATMENT

The Natural Resource Conservation Service (Reference 1), previously the Soil Conservation Service (Reference 2) has been mapped with two soil descriptions. The Soil Survey Map (Reference 1) is presented in Figure 4, and the Soil Survey Descriptions (Reference 2) are presented in Appendix D. The soils are described as having moderate to rapid percolation rates. The existing conventional septic system which is located on Lot 5 will remain. Existing septic records are included in Appendix E. Observations of the leach area indicated that the system is operating properly.

Soils encountered in the tactile test pits consisted of very clayey sandstone, gravelly clayey sandstone, and gravelly sandy loam. The limiting layers encountered in the test pits is the bedrock, which corresponds with USDA Soil Types 4A and R-1 with an LTAR values of 0.15 and 0.60 gallons per day per square foot, respectively.

Absorption fields must be installed a minimum of 4 feet above groundwater, bedrock, or confining layers. Should groundwater or bedrock be encountered within 6 feet of the surface, designed systems will be required. Designed systems are anticipated to be required on the lots due to the restrictive clay soils and high percentage of gravel sized material. Areas where a conventional system can be utilized could possibly be determined with additional testing. Testing will be required on each lot to determine the site characteristics and appropriate systems prior to construction.

On-site Wastewater Systems are to be designed on a per lot basis at the time of building permit. The systems are to meet County Chapter 8 OWTS criteria and State CDPHE criteria including any required mitigation to accommodate respective leach fields and infrastructure including, but not limited to earthwork grading, berming and diversion swale implementation, installation of secondary sand filters or any other higher treatment levels and dosing as required on a per lot basis and determined by test pit results and site topography. There are no identified geologic hazards on the site that are prohibitive to future OWTS design at this time.

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 designed systems are anticipated for the majority of the lots, depending on soils encountered. The Septic Suitability Map is presented in Figure 8. A potential house location, water well, and two septic sites for the lots are indicated on Figure 8. 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.

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 on each lot 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 Lions Den Trust, for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

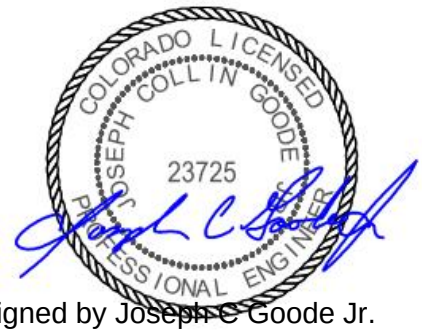
We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Sr. Geologist

Reviewed by:



Digitally signed by Joseph C Goode Jr.
Date: 05/11/26

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

Encl.

LLL/JCG
F:\AA Projects\2021\213150-Lions Den Trust-12120 Casey Ln-300-SGWW\09-Reports\213150 WWS.docx

REFERENCES

1. Natural Resource Conservation *Service,* August 24, 2023. *Web Soil Survey.* United States Department Agriculture, http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

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

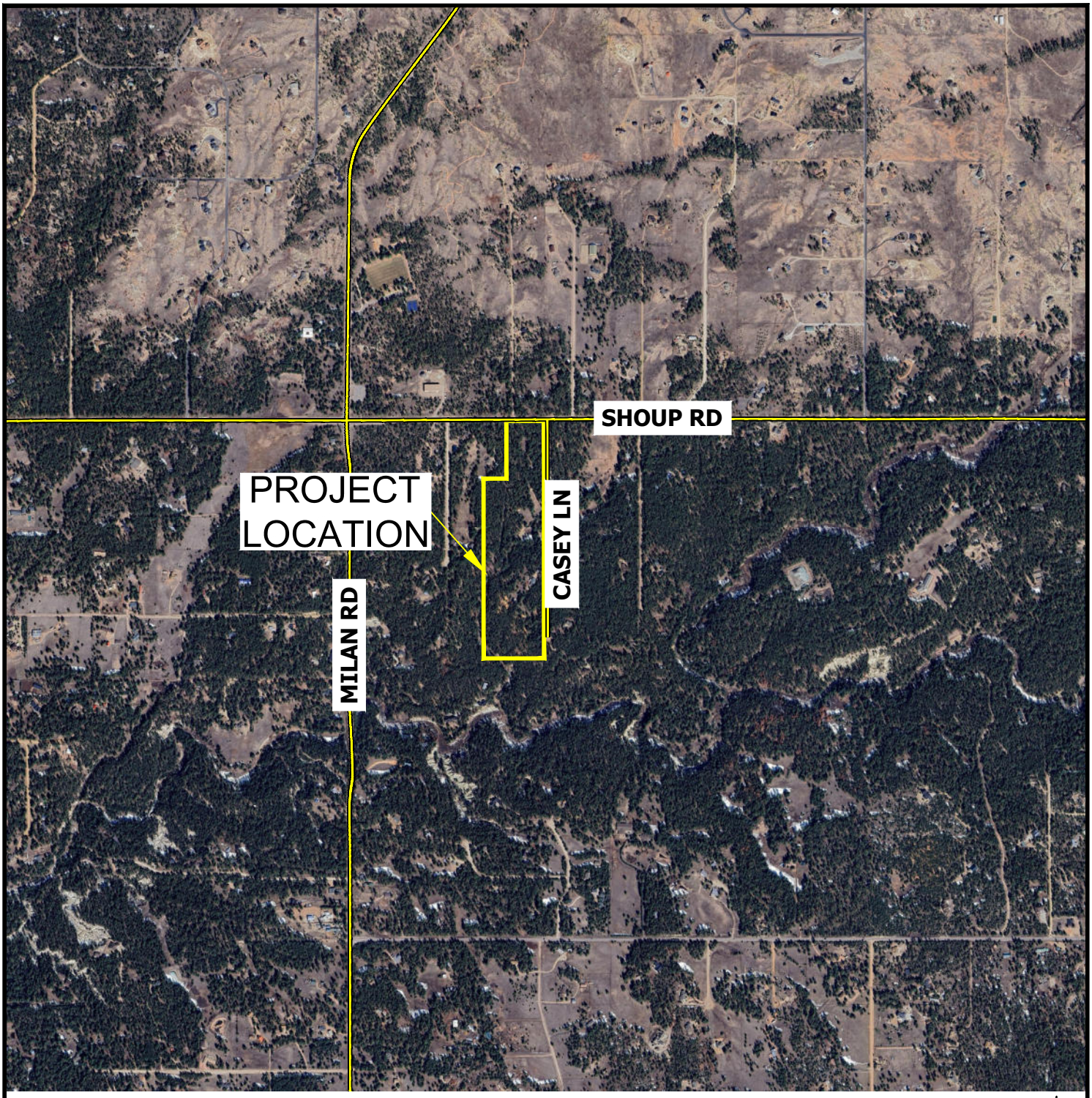
3. Bryant, Bruce; McGrew, Laura W. and Wobus, Reinhard A. 1981. *Geologic Map of the Denver 1° x 2° Quadrangle, North-Central Colorado*. U.S. Geologic Survey. Map I-1163.

4. Thorson, Jon P., 2003. *Geologic Map of the Black Forest Quadrangle, El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 03-6.

5. Trimble, Donald E. and Machette, Michael N. 1979. *Geologic Map of the Colorado Springs-Castle Rock Area, Front Range Urban Corridor, Colorado*. USGS, Map I-857-F.

6. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Number 08041C0301G.

FIGURES



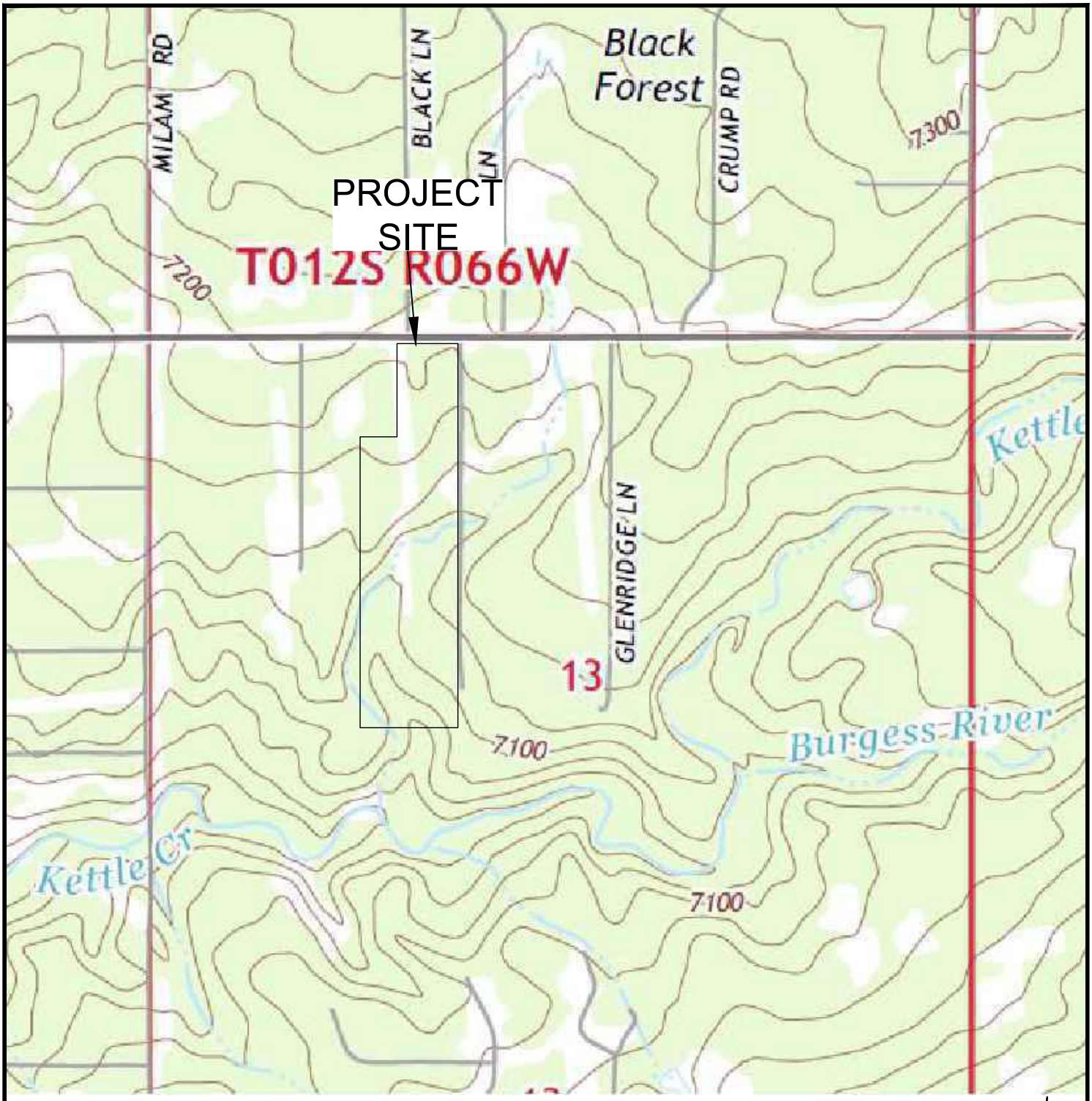
ENTECH ENGINEERING, INC.

VICINITY MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. 1



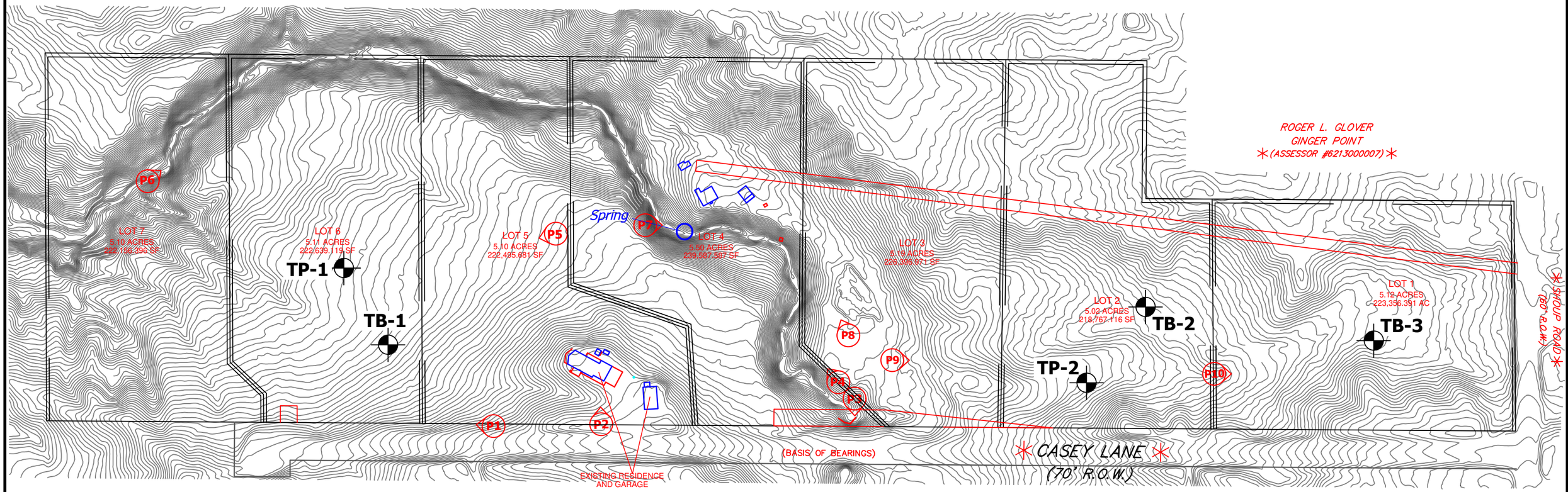
ENTECH ENGINEERING, INC.

USGS TOPOGRAPHY MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 2



- APPROXIMATE TEST BORING LOCATION AND NUMBER

P2 - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. 3



N

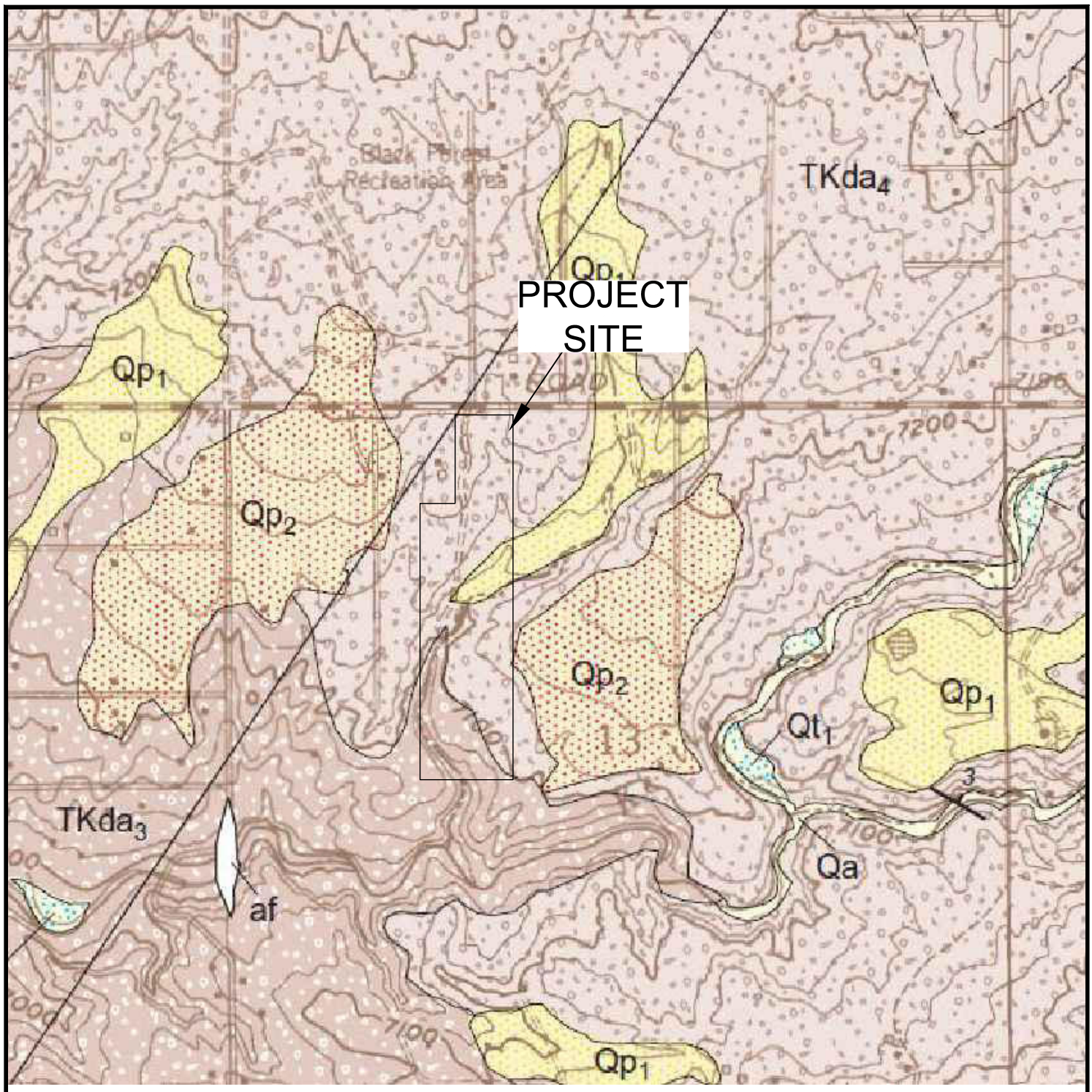
ENTECH ENGINEERING, INC.

SOIL SURVEY MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. 4



N

ENTECH ENGINEERING, INC.

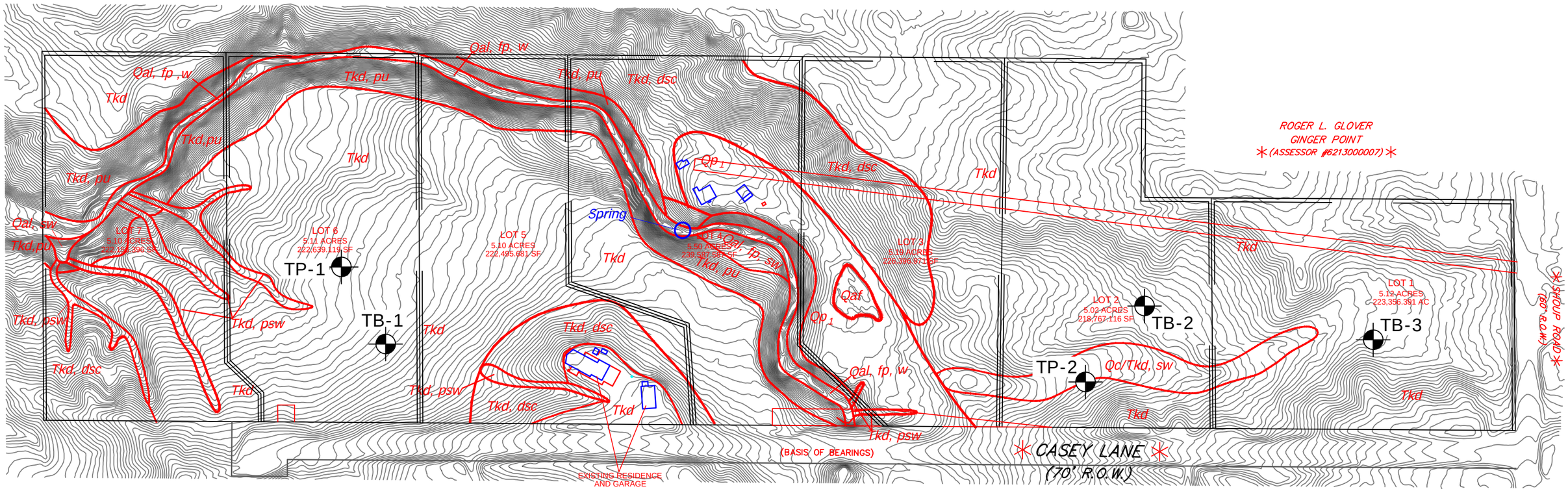
GEOLOGIC MAP OF THE COLORADO SPRINGS QUADRANGLE

12120 CASEY LANE

LIONS DEN TRUST

JOB NO. 213150

FIG. 5



◯ - Spring (lot 4)

Legend:

Qal - Alluvium of Quaternary Age:
recent stream deposited materials

Qp_1 - Younger Piedmont-Slope Alluvium of Holocene to late Pleistocene Age:
sheetwash and stream deposited alluvium

TKd - Dawson Formation of Tertiary to Cretaceous Age:
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone

dsc - downslope creep
pu - potentially unstable slopes
fp - floodplain
psw - potentially seasonal shallow groundwater area
sw - seasonally wet areas
w - flowing water

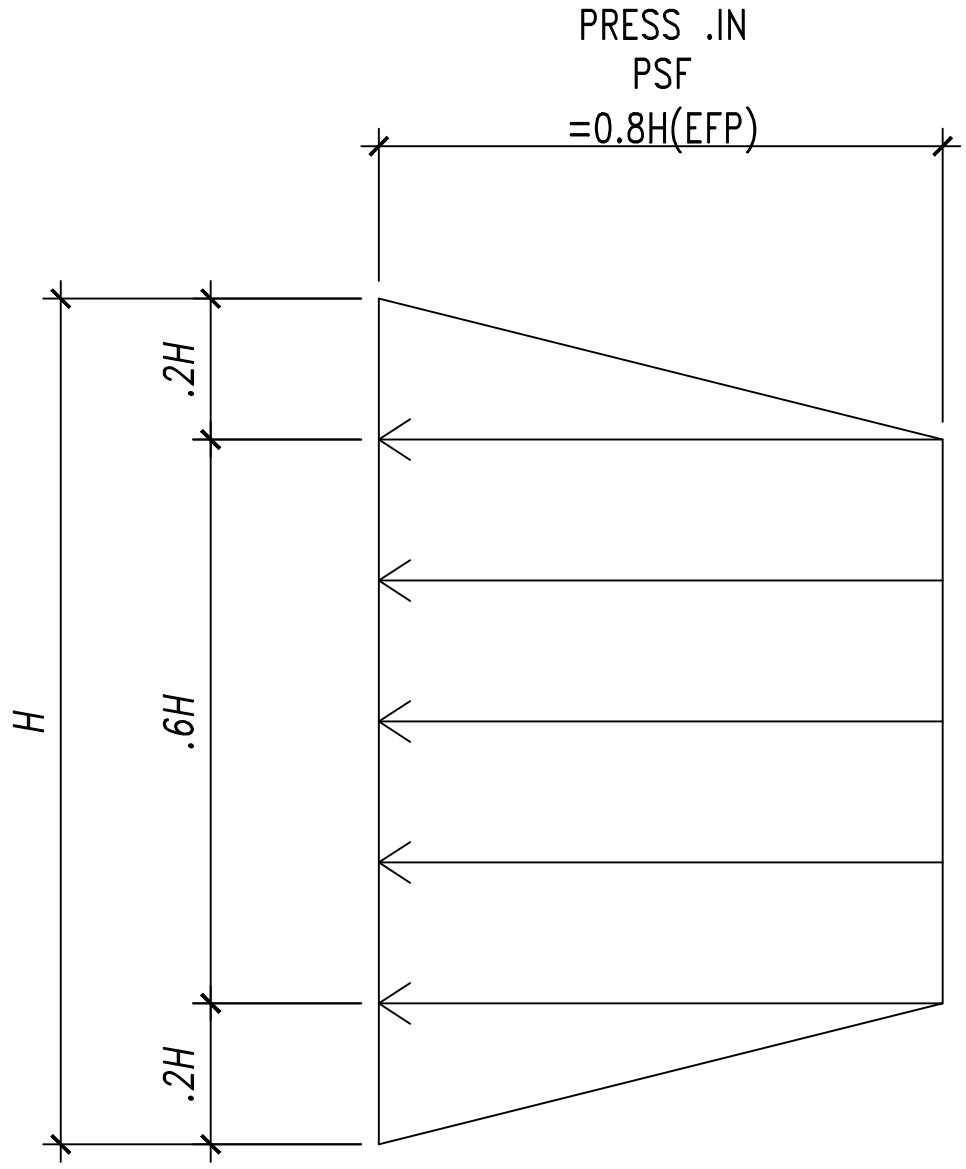
N

ENTECH ENGINEERING, INC.

GEOLOGY / ENGINEERING GEOLOGY MAP
12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 6



PRESSURE DISTRIBUTION

ENTECH ENGINEERING, INC.

LATERAL PRESSURE DIAGRAM

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 7



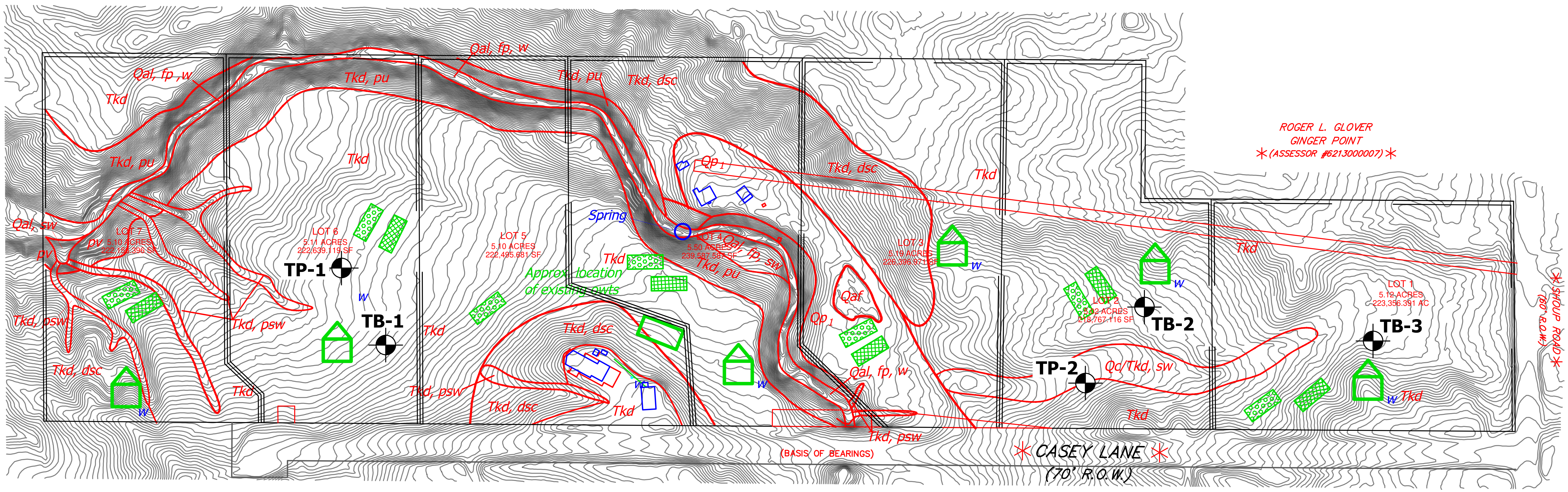
ENTECH ENGINEERING, INC.

FEMA FLOODPLAIN MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 8



○ - Spring (lot 4)

LEGEND:

- POSSIBLE OWTS LOCATIONS
- POSSIBLE OWTS ALTERNATE LOCATION
- POSSIBLE HOUSE LOCATIONS

W *- WATER WELLS MUST BE A MINIMUM OF 100 FT FROM OWTS ABSORPTION FIELDS

ENTECH ENGINEERING, INC.

OWTS SUITABILITY MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 9

APPENDIX A: Site Photographs



1

Looking south along Casey Lane from the eastern portion of the site.

July 25, 2025



2

Looking west towards existing residence on proposed lot 5.

July 25, 2025

Job No. 213150



3

Looking east towards existing box culvert along tributary crossing Casey Lane.

July 25, 2025



4

Looking southwest along drainage from the eastern side of the site.

July 25, 2025

Job No. 213150



5

Looking south from central portion of the site.

July 25, 2025



6

Looking north along potentially unstable slopes along drainage in the southwestern portion of the site.

July 25, 2025

Job No. 213150



7

Looking north along drainage in the central portion of the site.

July 25, 2025



8

Looking west towards fill piles located on proposed Lot 3.

July 25, 2025

Job No. 213150



9

Looking north from the central portion of the site.

July 25, 2025



10

Looking north from the northern portion of the site from the approximate Lot 1/2 lot line.

July 25, 2025

Job No. 213150

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING 1
DATE DRILLED 1/19/2022

REMARKS

DRY TO 15', 1/19/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/9"	5.9	2
5			50/6"	6.5	2
10			50/7"	12.5	3
15			50/5"	10.7	3
20					

SAND, SILTY, TAN

SANDSTONE, WEAK, TAN, WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

CLAYSTONE, WEAK, BROWN, WEATHERED (CLAY, SANDY, HARD, MOIST)

TEST BORING 2
DATE DRILLED 1/19/2022

REMARKS

DRY TO 15', 1/19/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50	2.1	2
5			50/7"	14.4	2
					3
10			50/6"	8.6	2
15			50/4"	12.2	2
20					

SAND, SILTY, TAN

SANDSTONE, WEAK, TAN, WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

CLAYSTONE, WEAK, BROWN, WEATHERED (CLAY, WITH SAND, HARD, MOIST)

SANDSTONE, WEAK, TAN, WEATHERED (SAND, CLAYEY, VERY DENSE, MOIST)

ENTECH ENGINEERING, INC.

TEST BORING LOGS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. B-1

TEST PIT 1
DATE EXCAVATED 1/21/2022
REMARKS

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type	
1						topsoil, sandy clay loam, dark brown,
2						
3			ma		4A	sandy clay, fine to medium grained, light brown, moist (completely weathered clayey sandstone
4						
5						
6						
7						
8						
9						
10						

TEST PIT 2
DATE EXCAVATED 1/21/2022
REMARKS Redoximorphic Features @ 4'

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type	
1						topsoil, sandy clay, dark brown, moist
2						
3			ma	sl	4A	sandy clay, fine to medium grained, light brown, moist (completely weathered clayey sandstone
4						
5						
6			ma		R-1	gravelly sandy loam, fine to coarse grained, grayish brown, very moist (weathered sandstone)
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
structureless - sl

ENTECH ENGINEERING, INC.

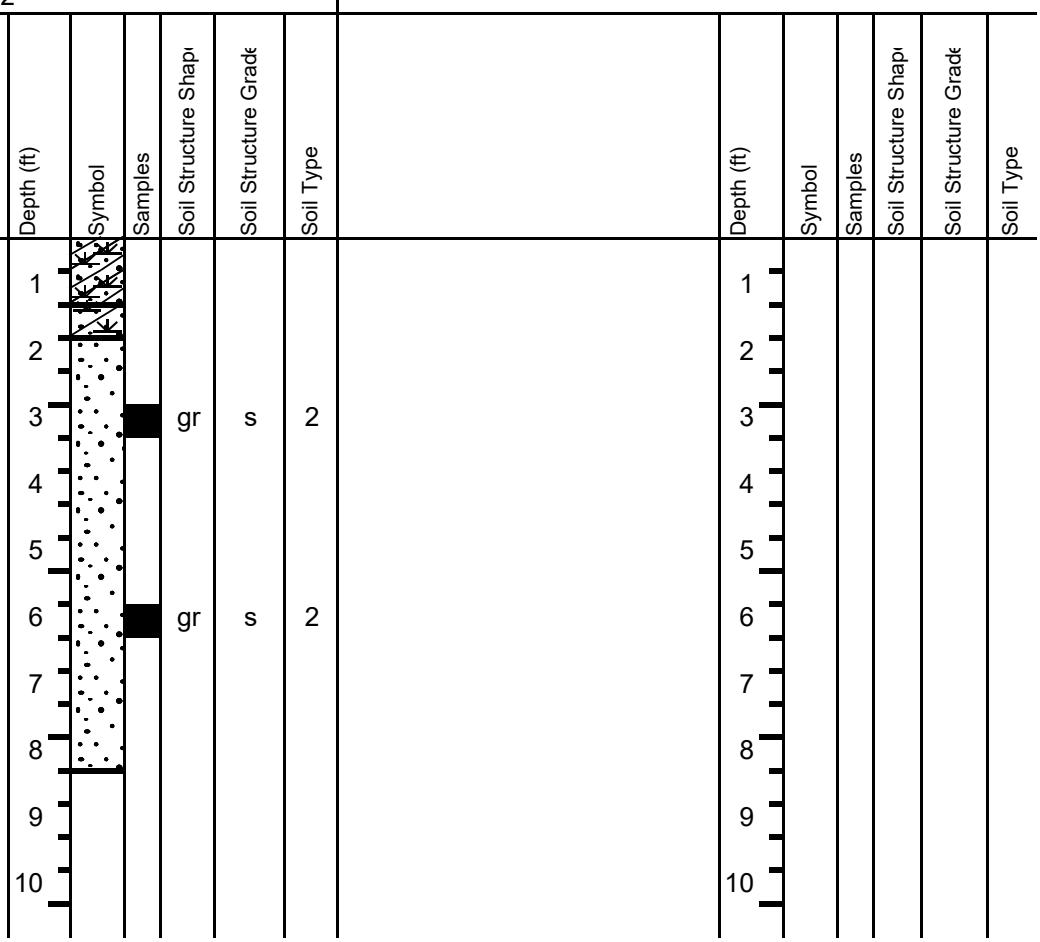
TEST PIT LOGS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 250183

FIG. B-2

TEST PIT 3
DATE EXCAVATED 1/21/2022
REMARKS



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

ENTECH ENGINEERING, INC.

TEST PIT LOGS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 250183

FIG. B-3

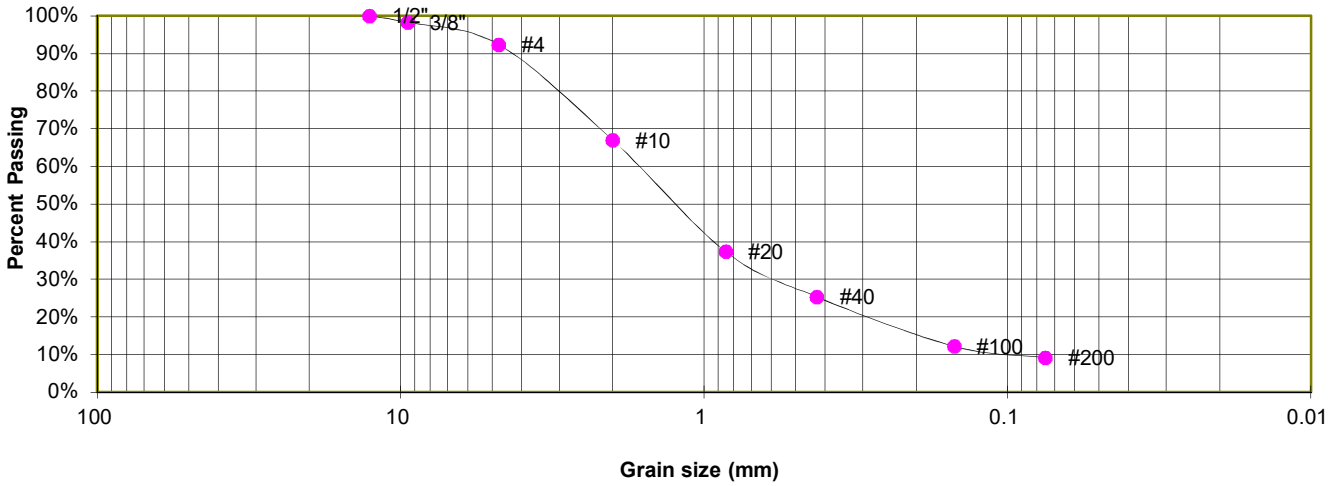
APPENDIX C: Laboratory Testing Results

ENTECH ENGINEERING, INC.

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	TP-3	3			9.2		SW-SM	SAND, WITH SILT
1	TP-1	2			49.8		SC	SANDSTONE (SAND, CLAYEY)
2	1	2-3			33.7		SM	SANDSTONE (SAND, SILTY)
2	TP-2	6			7.6		SW-SM	SANDSTONE (SAND, WITH SILT)
2	TP-2	3			30.8		SC	SANDSTONE (SAND, CLAYEY)
3	1	15	11.9	118.1	66.7	0.1	CL	CLAYSTONE (CLAY, SANDY)
3	2	5			84.2		CL	CLAYSTONE (CLAY, WITH SAND)

TEST BORING	TP-3	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.3%
4	92.4%
10	67.0%
20	37.4%
40	25.3%
100	12.2%
200	9.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

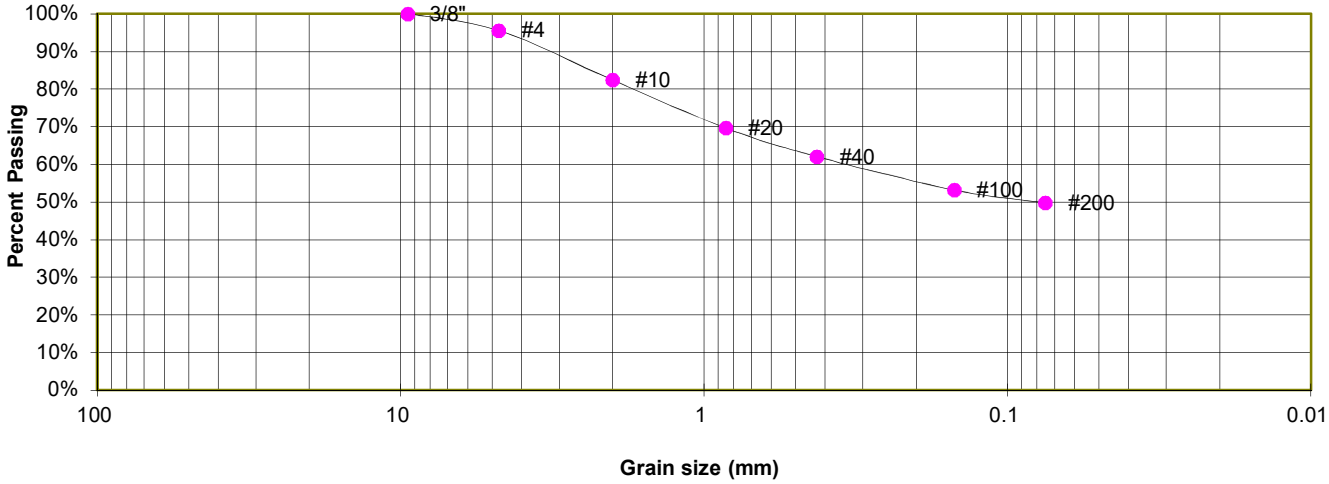
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. C-1

TEST BORING	TP-1	SOIL DESCRIPTION	SANDSTONE (SAND, CLAYEY)
DEPTH (FT)	2	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.6%
10	82.4%
20	69.7%
40	62.1%
100	53.2%
200	49.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

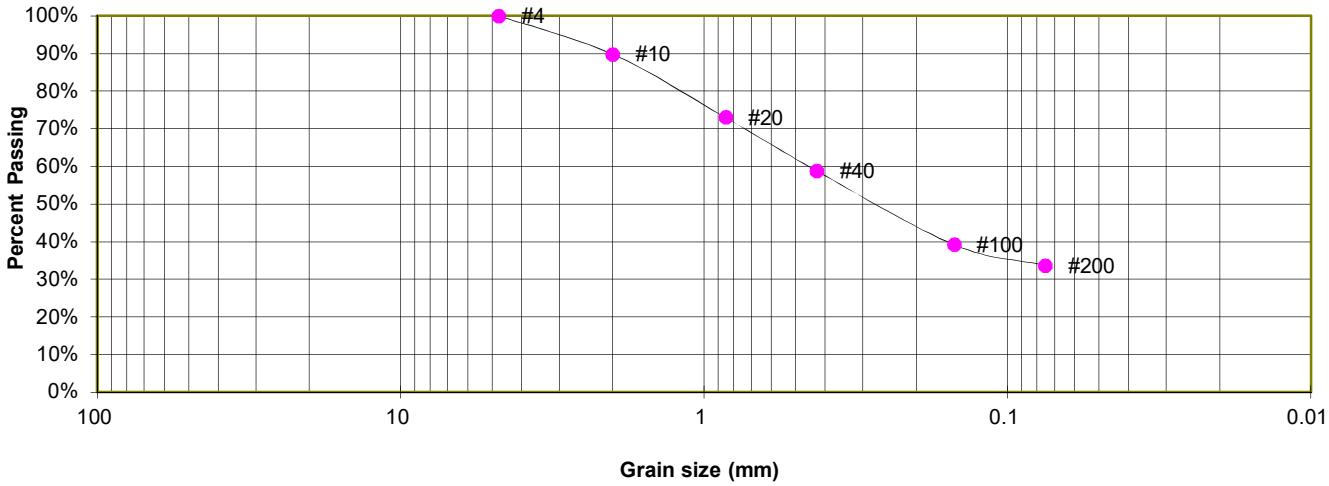
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-2

TEST BORING	1	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	2-3	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	89.8%
20	73.0%
40	58.8%
100	39.2%
200	33.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

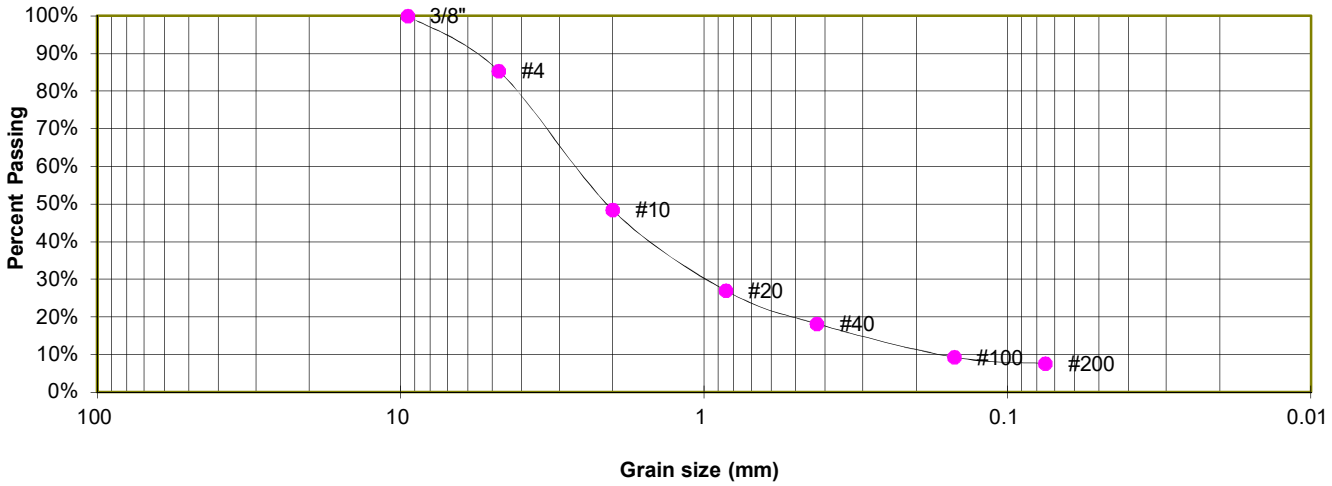
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-3

TEST BORING	TP-2	SOIL DESCRIPTION	SANDSTONE (SAND, WITH SILT)
DEPTH (FT)	6	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	85.4%
10	48.4%
20	27.0%
40	18.2%
100	9.3%
200	7.6%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

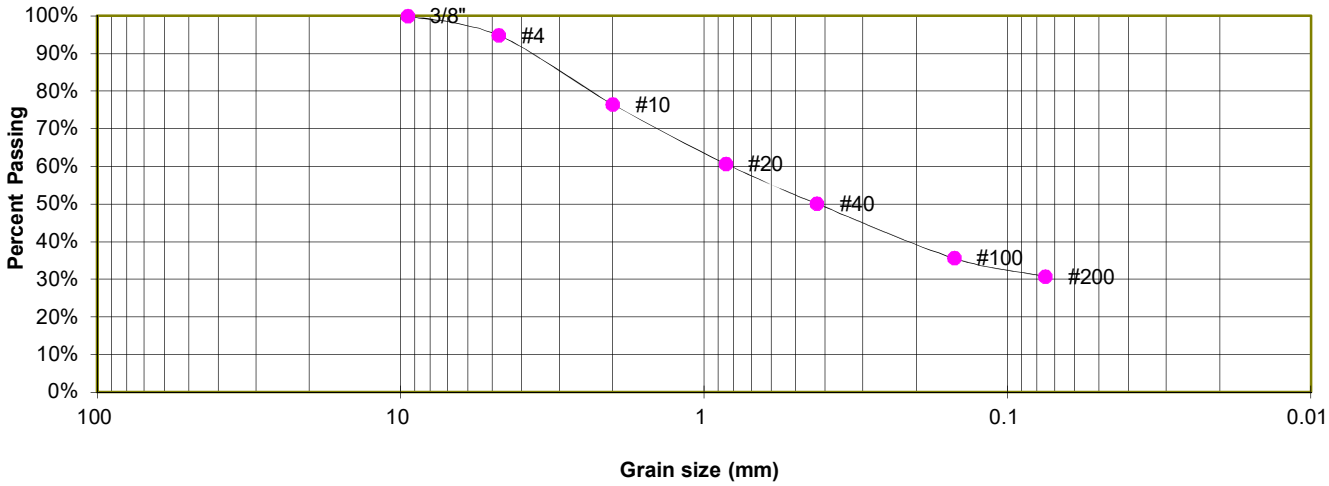
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-4

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.8%
10	76.5%
20	60.7%
40	50.1%
100	35.6%
200	30.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

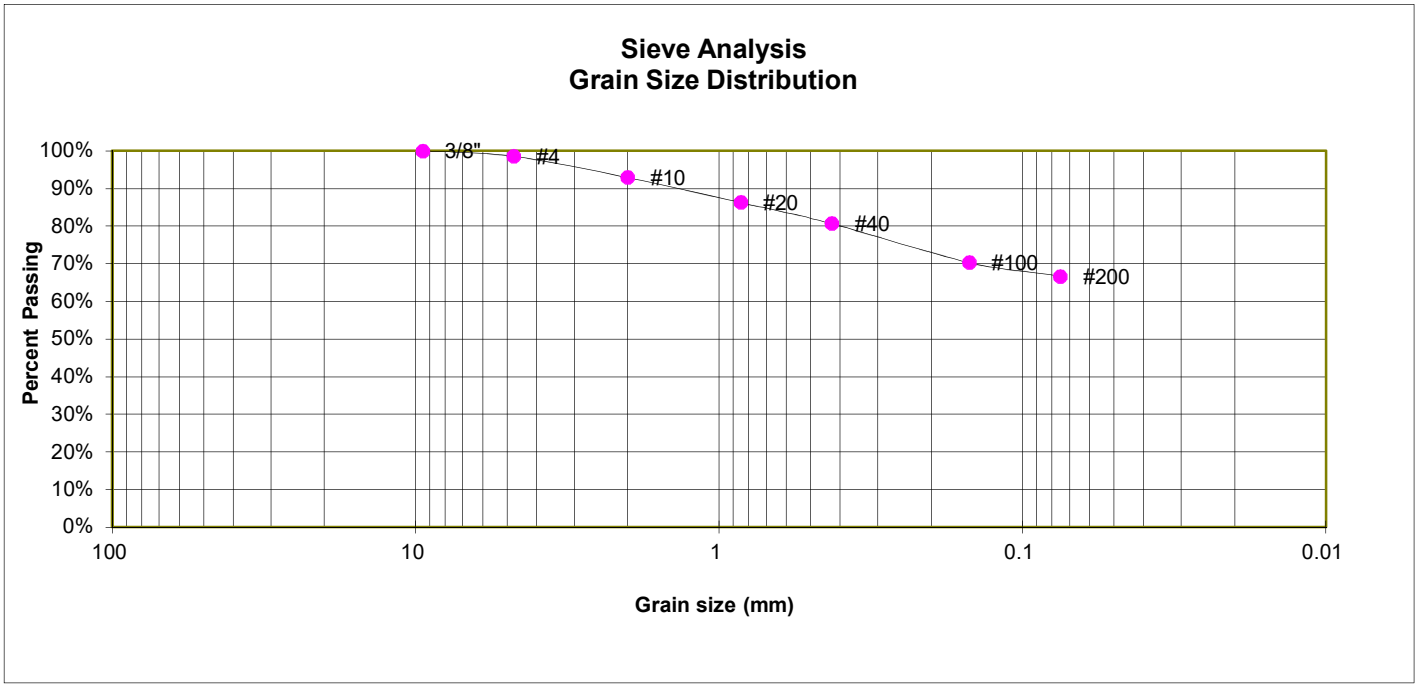
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-5

TEST BORING	1	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	15	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.5%
10	92.9%
20	86.3%
40	80.7%
100	70.3%
200	66.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

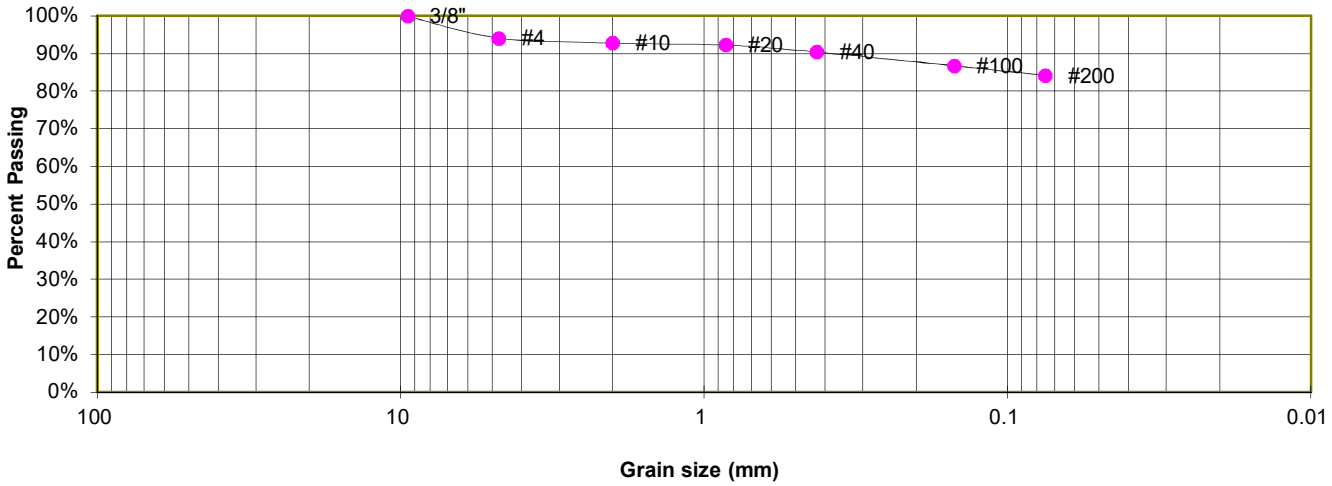
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-6

TEST BORING	2	SOIL DESCRIPTION	CLAYSTONE (CLAY, WITH SAND)
DEPTH (FT)	5	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.1%
10	92.8%
20	92.3%
40	90.4%
100	86.8%
200	84.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-7

TEST BORING	1	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	15	SOIL TYPE	3



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 118
NATURAL MOISTURE CONTENT: 11.9%
SWELL/COLLAPSE (%): 0.1%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-8

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

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

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 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 (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 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024

El Paso County Area, Colorado

41—Kettle gravelly loamy sand, 8 to 40 percent slopes

Map Unit Setting

National map unit symbol: 368h
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

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

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 8 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
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 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024

APPENDIX E: El Paso County Health Department Existing Septic Records

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
INDIVIDUAL SEWAGE DISPOSAL SYSTEM INSPECTION FORM

Permit # 010462
Date 10/4/96

#62130-00-006

APPROVED: YES ✓ **NO** ____ ENVIRONMENTALIST KRUEGER

Address 12120 CASEY LN. Owner DELLACROCE

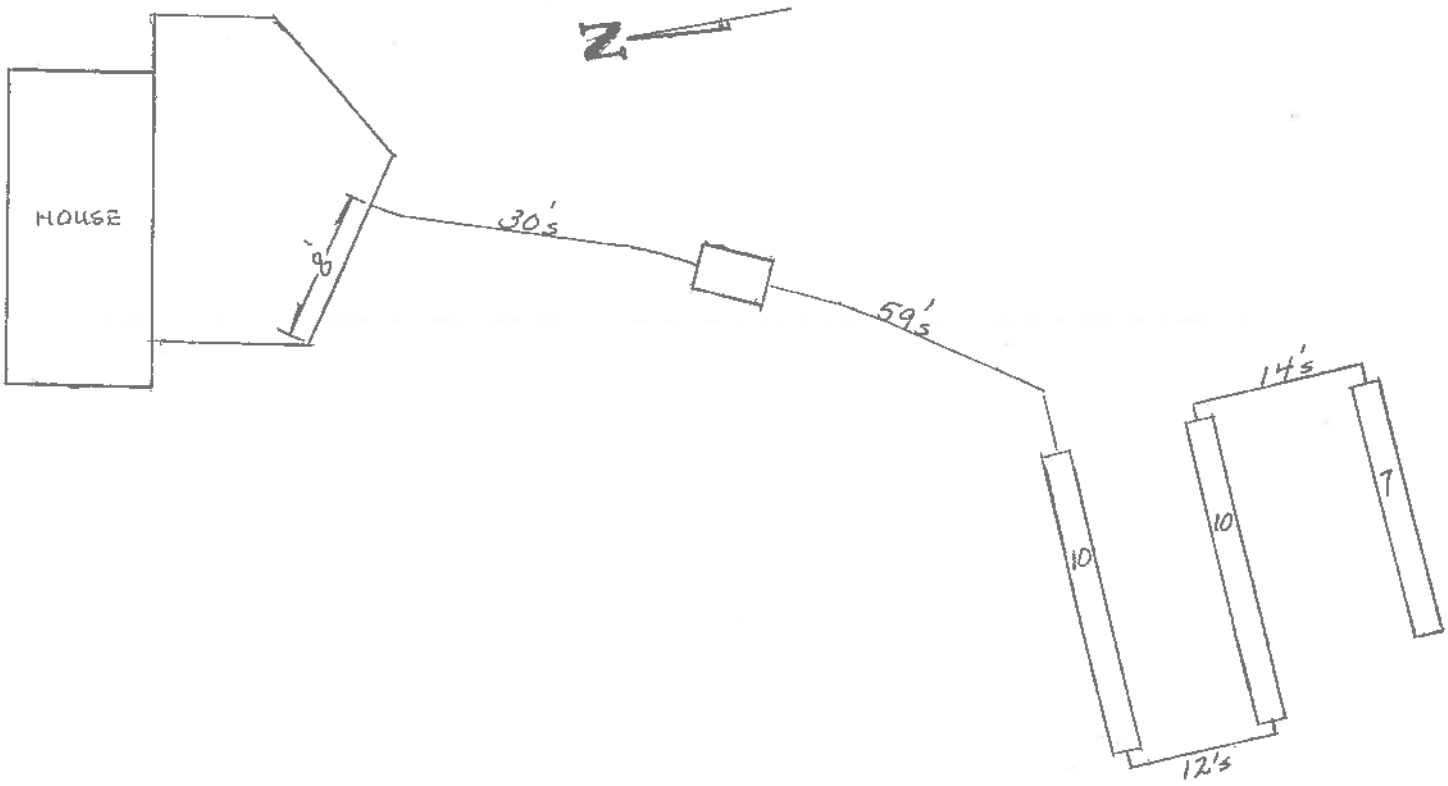
Legal Description ATTACHED
Residence ✓, # of bedrooms 3; Commercial ____; System Installer KUNAU

SEPTIC TANK:
Commercial ✓; Noncommercial ____, L ____, W ____, WD ____
Construction Material CONCRETE, capacity 1250 gallons.

DISPOSAL FIELD:
Rock Systems:
Trench: depth ____, width ____, total length ____, sq. feet ____
Bed: depth ____, length ____, width ____, sq. feet ____
Rock type ____, depth ____, under PVC ____, over PVC ____
Seepage Pits: # of pits ____, total # of rings ____, working depth(s) ____
size of pit(s) L X W ____, lining material ____, total sq. feet ____
Rockless Systems:
Chamber: Type INFILTRATOR, number of chambers 27, bed ____, trench ✓
sq. ft./section 18, reduction allowed 50 %, sq. ft required 604
total sq. ft. installed 972, depth of installation 12"-30"
Engineer Design Y or (N), Designing Engineer ____,
Approval letter provided? Y or N
Well 50 feet from tank Y or N 100 feet from leach field Y or N
Well installed at time of septic system inspection Y or (N) Public Water ____
*Approval will be revoked if in the future the well is found to be within 50 feet of the septic tank and/or 100 feet of the disposal field.

NOTES:

CASEY LN.



Acres 36.7 EL PASO COUNTY • DEPARTMENT OF HEALTH AND ENVIRONMENT

Water Supply WELL 301 South Union Blvd. • Colorado Springs, Colorado • 578-3125

Permit 010462

PERMIT

TO CONSTRUCT, ALTER, REPAIR OR MODIFY ANY INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Issued to RON & MARJORIE DELLACROCE Receipt No. 10C

Address of Property 12120 CASEY LANE, W2, E2, NW2, SEC: 13-T12S-R66W Date 8-5-96

(Permit valid at this address only) Phone 495-2843

Sewage-Disposal System work to be performed by Kernau Drilling Phone

This Permit is issued in accordance with 25-10-106 Colorado Revised Statutes 1973, as amended. PERMIT EXPIRES upon completion of installation of sewage-disposal system or at the end of twelve (12) months from date of issue--whichever occurs first-(unless work is in progress). This permit is revokable if all stated requirements are not met.

-THIS PERMIT DOES NOT DENOTE APPROVAL OF ZONING AND ACREAGE REQUIREMENTS-

$150.00
PERMIT FEE (NOT REFUNDABLE)

8-5-97
DATE OF EXPIRATION

DIRECTOR, DEPARTMENT OF HEALTH AND ENVIRONMENT

ENVIRONMENTALIST

NOTE: LEAVE ENTIRE SEWAGE-DISPOSAL SYSTEM UNCOVERED FOR FINAL INSPECTION. 48 HOUR ADVANCE NOTICE REQUIRED.

SEPTIC TANK:	TRENCH SYSTEM:	BED SYSTEM:	SEEPAGE PIT SYSTEM:
1250 gallons	total square feet *604 ____ ft. of trench ____ inches wide ____ ft. of trench ____ inches wide	total square feet	total square feet ____ rings or ____ diam. x ____ w/d

NOTES: MEET ALL APPLICABLE ISDS REGULATIONS. *RECOMMEND ADDITIONAL 60 PER CENT FOR WASHER AND DISPOSAL. MAINTAIN 4 FOOT SEPARATION BETWEEN BOTTOM OF TRENCHES AND BEDROCK.

The Health Office shall assume no responsibility in case of failure or inadequacy of a sewage-disposal system, beyond consulting in good faith with the property owner or representative. Free access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with requirements of this law.

ON FAX # 6213000006 P

10/04/96

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
301 South Union Boulevard
Colorado Springs, CO 80910-3123

APPLICATION TO CONSTRUCT, REMODEL OR INSTALL AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Ron & Marjorie Dellacroce — (719) 495-2843
Name of Owner — Phone

12120 Casey Ln., Black Forest — W½, E½, NW ¼ of section 13, T12S, R66W
Address of Property — Legal Description

P.O. Box 88174, Black Forest, CO 80908 — T.B.D — GENERAL CONTRACTOR:
Owner's Mailing Address — Septic Contractor and Phone # WESTERRA HOMES (719) 488-1772,

6213O-00-006 — Single Family — WELL
Tax Schedule Number — Type of Building by Use — Source of Water Supply

36.7 ac. — 3
Lot Size — MAXIMUM POTENTIAL NUMBER OF BEDROOMS

Basement Y (N) — Percolation Test Attached (Y) N — Garbage Disposal (Y) N — Clothes Washer (Y) N

I have supplied a plot plan as described on the back of this form. I acknowledge the completeness of the application is conditional upon such further mandatory and additional tests and reports as may be required by the Department to be made and furnished by a applicant for purposes of evaluating the application, and issuance of the permit is subject to such terms and conditions as deemed necessary to ensure compliance with rules and regulations adopted pursuant to C.R.S. 10-25-101 et. seq. I hereby certify all represented to be true and correct to the best of my knowledge and belief, and are designed to be relied on by the El Paso County Department of Health and Environment in evaluating the same for purposes of issuing the permit, applied for herein. I further understand any falsification or misrepresentation may result in the denial of the application or revocation of any permit granted based upon said application and in legal action for perjury as provided by law.

OWNER'S SIGNATURE Ronald J Della Croce Marjorie A Della Croce — Date 7-13-96

DEPARTMENT OF HEALTH USE ONLY

* 604 — 1250 — 7/9/96
Absorption Area — Tank Capacity — Date of Site Inspection

REMARKS: MEET ALL APPLICABLE ISDS REGS * RECOMMEND ADDITIONAL 60% FOR WASHER + DISPOSAL MAINTAIN 4' SEPARATION BETWEEN BOTTOM OF TRENCHES + BEDROCK

ok

Kmc — 7/9/96 — Application is APPROVED DENIED Pending Planning approval
ENVIRONMENTALIST — Date

PERMIT # 10462 — DATE TO EPC PLANNING DEPT 7/9/96

JPC 8-6-96

PROPERTY AND PERC HOLES MUST BE CLEARLY MARKED OR POSTED

The ORIGINAL of your percolation (perc) test is required.

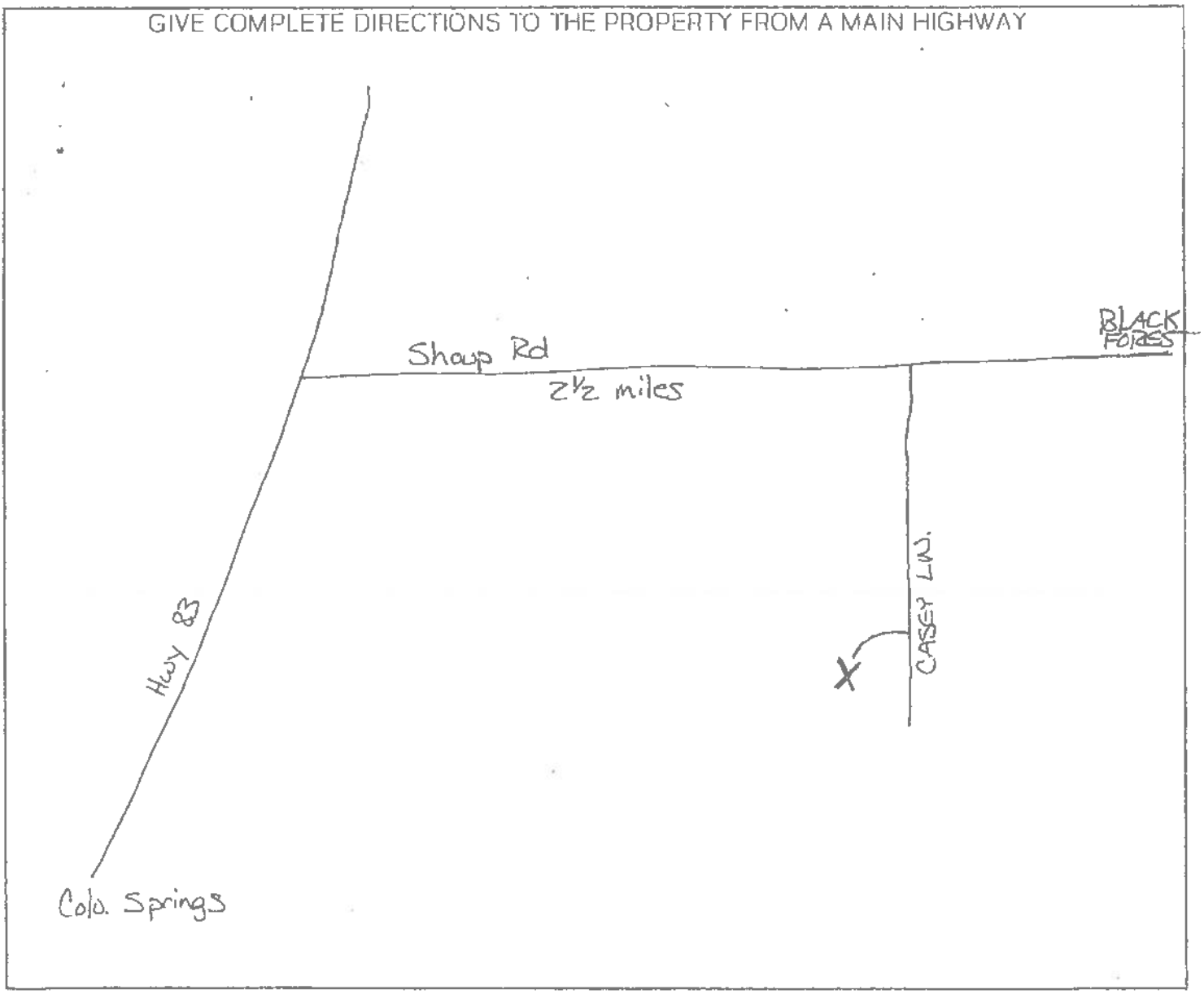
The following information must be on your PLOT PLAN.

- ✓ Property lines
- ✓ Proposed septic system site
- ✓ Well(s)
- ✓ Building(s)
- ~~Water line~~
- ✓ Subsoil drain(s)
- Property dimensions
- Designated alternate septic system site
- Adjacent property well(s)
- Proposed building(s)
- Cistern

If any of these are within 100 feet of your proposed septic system include on your plot plan

- Spring(s)
- Pond(s)
- Dry Gulch(s)
- Lake(s)
- Stream(s)
- Natural drainage course(s)

GIVE COMPLETE DIRECTIONS TO THE PROPERTY FROM A MAIN HIGHWAY



FRONT RANGE GEOTECHNICAL INC.

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

PERCOLATION TEST

FOR

RON & MARJORIE DELLACROCE

JOB #4318

**W 1/2 OF E 1/2, NW 1/2, Section 13,
TS 12 S, Range 66 West of the 6th PM,
12120 Casey Lane,
El Paso County,
Colorado**

Respectfully submitted,

Jeff Houchin
Geologist

Reviewed by,

9 JUL 96

Paul R. Bryant, P.E.
Civil Engineer

PERCOLATION TEST FINDINGS

Enclosed are the results of the percolation test for the septic system to be installed at **W 1/2 of E 1/2, NW 1/2, Section 13, TS 12 S, Range 66 West of the 6th PM, 12120 Casey Lane, El Paso County, Colorado.** The residence will not be on a public sewer system or on a public water system. The number of bedrooms in the design for the residence is three. Due to the natural slope of the property, the entire system will gravity feed to the southwest approximately 111 feet down slope. All applicable regulations of the El Paso County Health Department will be complied with for the installation of the disposal system.

The percolation test was performed on June 27, 1996, with three test holes being dug. The location of these test holes was determined by Troy Coats of Westerra Homes. These test holes had one foot of water placed in them and were allowed to pre-soak for 24 hours. For the test, the holes were filled to the bottom 25% of the hole and allowed to drain while measurements were taken every 10 minutes of the test. The field data and results of the percolation test are on the following page.

The average of the three test holes is one inch in 19.6 minutes which I feel is representative of the soils conditions in the area. A rate of one inch in 19.6 minutes will be adequate for the design and sizing of the disposal system. While there are some variations in the rate of percolation for each hole there is no significant variation in the composition of materials encountered while drilling these holes. The test and procedures conform to **El Paso County Health Department** regulations. The soil profile for the disposal system is as follows.

0 to 2"	-	Topsoil- sandy loam, organic composition.
2" to 9'	-	Sand- fine to medium grained, moderate density, moderate moisture and moderate clay content, moderate plasticity,
9' to 12'	-	Sandstone- very dense, same properties as above, buff-tan in color throughout.

No water was encountered during the drilling of all holes. Bedrock (sandstone) was encountered at 9 feet below the native ground level. No known wells were observed within 100 feet of the proposed system. The following setbacks shall be followed during the construction of the field: **All setbacks must be in compliance with the county regulations.**

If during construction of the field itself, subsurface conditions change considerably or if the location of the proposed field changes, this office shall be notified to determine whether the conditions are adequate for the system as designed or whether a new system needs to be designed.

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

FRONT RANGE GEOTECHNICAL, INC

PERCOLATION TEST DATA FORM

NAME Ron & Marjorie Dellacroce ADDRESS 12120 Casey Lane SW 1/2 of E 1/2, NW 1/2, Sec. 13, T 12S, R 66W, 6th

CITY Black Forest STATE Colorado ZIP _____ PHONE _____

LOCATION OF TEST See Site Map COUNTY El Paso

WATER SUPPLY Private BEDROOMS 3 SLOPE S.W. 8%

DATE OF TEST 6-27-96 DIAMETER 5" DEPTH 32"

DROP IN INCHES

TIME	P-1	P-2	P-3
9:30			
9:40	3-	3 3/4	2 1/8
9:50	1 7/8	2 11/16	1-
10:00	1 1/2	1 7/8	7/8
10:10	1-	1 1/8	1/2
10:20	9/16	13/16	7/16
10:30	1/2	11/16	
10:40		5/8	
AVERAGE FOR EACH HOLE	20	16	22.9
TOTAL AVERAGE	1 INCH IN 19.6 MINUTES		

PROFILE 0-2" Topsoil;
2"-9' Sand-Fine to Medium Grained, Moderate Density, Moisture and Clay Content, Moderate Plasticity;
9'-12' Sandstone-Very Dense-Same Properties As Above, Buff-Tan Color Throughout.

GROUNDWATER None BEDROCK 9' Sandstone

Site Map

W 1/2 of E 1/2, NW 1/2, Section 13,
TS 12 S, Range 66 West ot the 6th PM,
12120 Casey Lane,
El Paso County, Colorado

Location from Found Survey Pin to PROFILE: S. 61° W. - 303'

Locations from PROFILE to:

P-1:	N. 30° W.	- 14'
P-2:	N. 62° E.	- 8'
P-3:	S. 21° E.	- 19'

