

Revised: April 8, 2021  
December 21, 2020



**ENTECH**  
ENGINEERING, INC.

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

Delroy Johnson  
14502 Highway 83  
Colorado Springs, CO 80919

Re: OWTS – Wastewater Study  
Johnson Subdivision No. 1  
Parcel No. 61000-00-157  
14502 Highway 83  
El Paso County, Colorado

Dear Mr. Johnson:

### **GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION**

The site is located in a portion of the SW¼ of Section 34 Township 11 South, Range 66 West of the 6<sup>th</sup> Principal Meridian in El Paso County, Colorado. The site is located approximately 1-mile northeast of Colorado Springs city limits, southwest of Kaessler Lane and Highway 83 in El Paso County, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is gradually to moderately sloping to the south-southeast, with steeper slopes along a ridge that bisects the site trending NW-SE. The several minor drainage swales are located on the property. Water was not observed in the drainages at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped and rural residential. The site contains field grasses, weeds, kinnikinic, and ponderosa pines. An existing house with a water well and septic system are located on Lot 1, which will remain. Site mapping and test pit excavations were completed on December 9, 2020.

Total acreage involved in the proposed subdivision is 28.62-acres. Four rural residential lots are proposed as part of the replat. The proposed lot sizes range from 5.01-acres to 13.63-acres. An existing house is located on Lot 1 which will remain. The new lots will be serviced by individual wells and on-site wastewater treatment systems. The Site Plan with the proposed replat is presented in Figure 3.

### **SCOPE OF THE REPORT**

The scope of the report will include the following:

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

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## 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 December 9, 2020.

Six test pits were excavated on the site to determine general suitability for the use of on-site wastewater treatment systems and general soil characteristics for residential construction. The locations of the test pits are indicated on the Site Plan/Test Pit Location Map, Figure 3. The Test Pit Logs are presented in Appendix A. 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 B.

## 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 three soil types on the site. Complete descriptions of the soil types are presented in Appendix C. In general, the soils consist of sandy loam to gravelly loamy sand. The soils are described as follows:

<u>Type</u>	<u>Description</u>
41	Kettle gravelly, loamy sand, 8 – 40% Slopes
71	Pring coarse sandy loam, 3 – 8% Slopes

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as homesites. 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 consisted of sandy loam to gravelly, sandy loam and loamy sand overlying weathered to formational silty to very silty sandstone. Bedrock was encountered at depths ranging from 2 to 3.5 feet in Test Pit Nos. 1 – 4. The samples of sands tested had approximately 5 to 13 percent of the soil size particles passing the No. 200 sieve. The samples of sandstone tested had approximately 16 to 40 percent of the soil size particles passing the No. 200 sieve. Highly expansive claystone and siltstone lenses are commonly interbedded in the Dawson Formation.

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14502 Highway 83  
El Paso County, Colorado

### Groundwater

Groundwater or signs of seasonally occurring water were not encountered in the test pits, which were excavated to depths of 4 to 8 feet. Groundwater is not anticipated to affect shallow foundations on the majority of the site. Several minor drainage swales are located across the site. These areas have the potential for seasonal shallow groundwater. Due to the size of the proposed lots these areas can either be avoided or redirected around proposed structures or proposed soil treatment areas. 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 8 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 Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers of claystone or siltstone.

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

**Qc/Tkd Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Black Forest Quadrangle* distributed by the Colorado Geologic Survey in 2003 (Reference 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 Pueblo 1° x 2° Quadrangle*, distributed by the US Geological Survey in 1978 (Reference 6). The test pits were used in evaluating the site and are included in Appendix A. The Geology Map prepared for the site is presented in Figure 6.

### Drainage Areas

Several minor drainage swales exist on the site. No water was observed flowing in the drainage swales at the time of the investigation, however, these areas have the potential for seasonal shallow groundwater. These areas are indicated on the Geology/Engineering Geology Map (Figure 6). Due to the size of the proposed lots, these areas can either be avoided or redirected

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around proposed structures or proposed soil treatment areas. The anticipated OWTS locations are not affected by these areas. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO295G dated December 7, 2018 (Figure 7, Reference 7). Exact locations of floodplain and specific drainage studies are beyond the scope of this report. Individual wastewater treatment systems must be located a minimum of 25 feet from dry gulches and 50 feet from water courses or floodplains.

## **ON-SITE WASTEWATER TREATMENT**

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

Soils encountered in the tactile test pits consisted of gravelly, sandy loam to sandy loam, and gravelly, loamy sand to loamy sand overlying weathered to formational silty to very silty sandstone. The limiting layers encountered in the test pits are the sandy loam, and the silty to very silty sandstone, which corresponds with USDA Soil Types 2A and 3A with an LTAR values of 0.50 and 0.30 gallons per day per square foot. Weathered bedrock was encountered at approximately 2 to 3.5 feet in Test Pit Nos. 1 – 4 (Lots 3 and 4). Bedrock was not encountered in Test Pit Nos. 5 – 6 (Lot 2).

Signs of seasonally occurring groundwater were not observed in the test pits. Absorption fields must be maintained a minimum of 4 feet above groundwater or bedrock, or confining layer. Should groundwater or bedrock be encountered within 6 feet of the surface, designed systems will be required. Designed systems are anticipated for Lots 3 and 4, and a conventional system is anticipated for Lot 2.

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 will be required for proposed lots 3 and 4. The Septic Suitability Map is presented in Figure 8. Proposed house locations, water wells, and two septic sites for the new lots are indicated. 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.

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OWTS – Wastewater Study-Revised  
Johnson Subdivision No. 1  
Parcel No. 61000-00-157  
14502 Highway 83  
El Paso County, Colorado

**CLOSURE**

This report has been prepared for Delroy Johnson, 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.  
Geologist

Reviewed by



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

LLL

Encl.

Entech Job No. 202746  
AAprojects/2020/202746 wws-rev

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Parcel No. 61000-00-157  
14502 Highway 83  
El Paso County, Colorado

## BIBLIOGRAPHY

1. Natural Resource Conservation *Service*, September 13, 2019. *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. Scott, Glen R.; Taylor Richard B.; Epis, Rudy C; and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado*. Sheet 2. U.S. Geologic Survey. Map I-1022, Sheet 2.
4. Thorson, Jon P. and Madole, Richard F., 2003. *Geologic Map of the Monument Quadrangle, El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 02-40.
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. Scott, Glen R.; Taylor Richard B.; Epis, Rudy C; and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado*. Sheet 2. U.S. Geologic Survey. Map I-1022.
7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado*. Map Number 08041CO295G

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## TABLE

**Table 1: Summary Tactile Test Pit Results**

<b>Test Pit No.</b>	<b>USDA Soil Type</b>	<b>LTAR Value</b>	<b>Depth to Bedrock (ft.)</b>	<b>Depth to Seasonally Occurring Groundwater (ft.)</b>
1	3A*	0.30*	2*	N/A
2	3A*	0.30*	2*	N/A
3	3A*	0.30*	3*	N/A
4	3A*	0.30*	3.5*	N/A
5	2A	0.50	> 8	N/A
6	2A	0.50	> 8	N/A

\*- Conditions that will require an engineered OWTS



## FIGURES



39°02'12.1"N, 104°46'53.1"W (39.0367, -104.78155)

500 ft



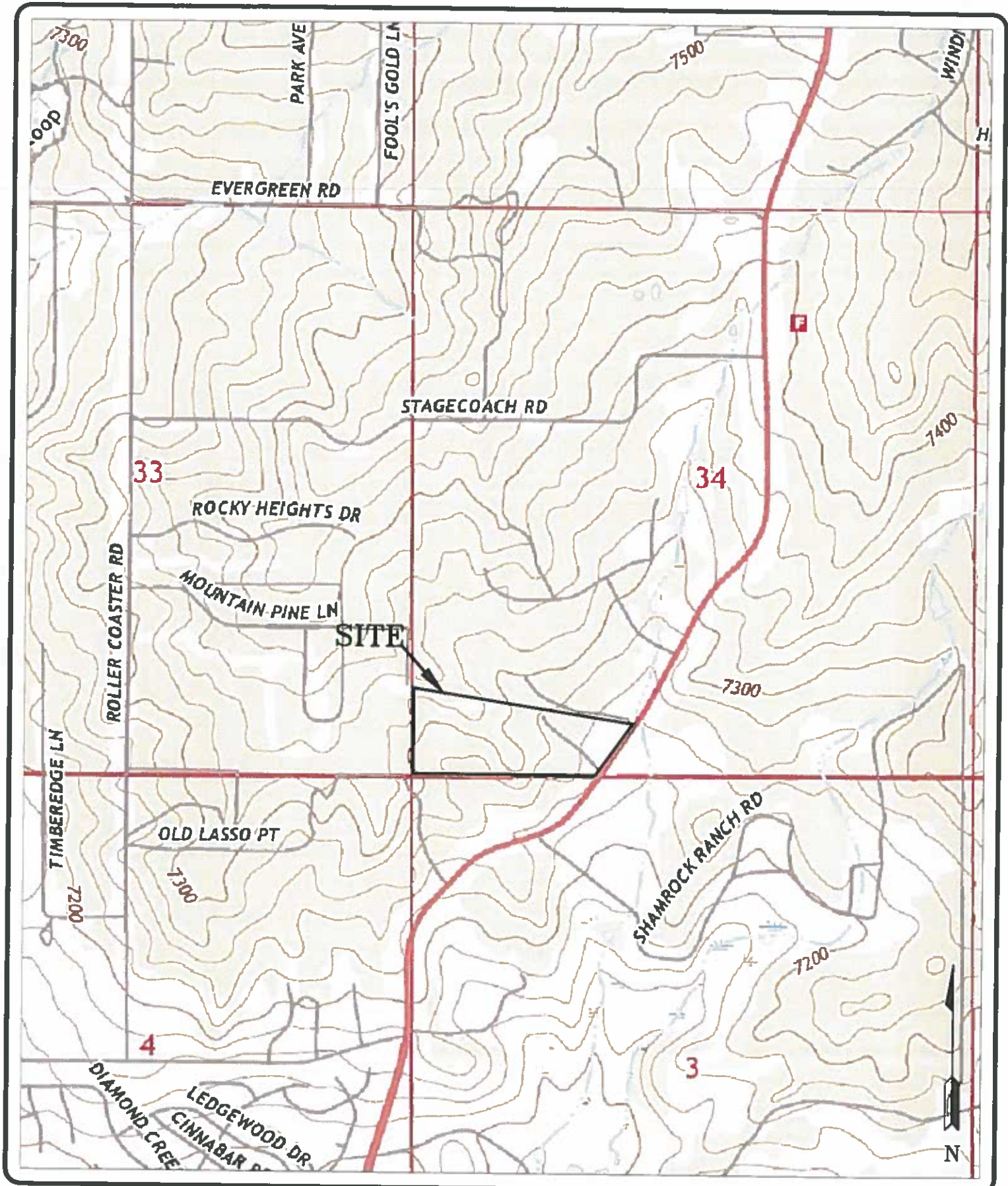

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**VICINITY MAP**  
**JOHNSON SUBDIVISION NO. 1**  
**14502 HIGHWAY 83**  
**EL PASO COUNTY, CO.**  
**FOR: DELROY JOHNSON**

DRAWN: LLL	DATE: 12/18/20	CHECKED:	DATE:
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JOB NO.:  
**202746**

FIG NO.:  
**1**

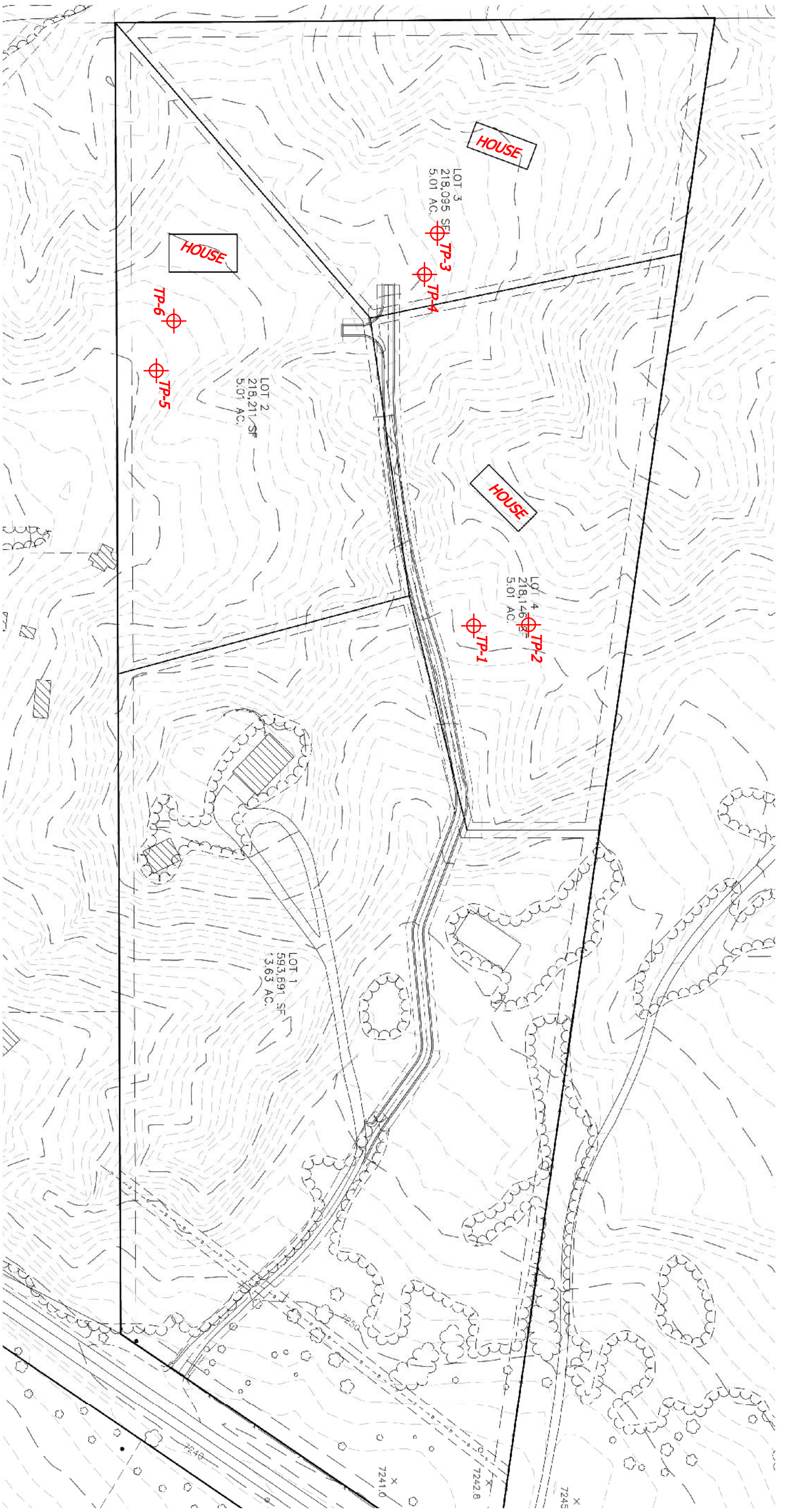
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USGS MAP  
 JOHNSON SUBDIVISION NO. 1  
 14502 HIGHWAY 83  
 EL PASO COUNTY, CO.  
 FOR: DELROY JOHNSON

DRAWN: LLL	DATE: 12/18/20	CHECKED:	DATE:
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JOB NO.:  
 202746

FIG NO.:  
 2



⊕ - approximate test pit location and number



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JOHNSON SUBDIVISION NO. 1  
LOT LAYOUT

DESIGNED BY	YAM	SCALE	DATE
DRAWN BY	YAM	LOT 1" = 80'	12/

DATE	12/19/20
SCALE	AS SHOWN
JOB NO.	202746
FIGURE NO.	3

**SITE PLAN/TESTING LOCATION MAP**  
**JOHNSON SUBDIVISION NO. 1**  
 14502 HIGHWAY 83  
 EL PASO COUNTY, CO.  
 FOR: DELROY JOHNSON

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REVISION BY	



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SOIL SURVEY MAP  
 JOHNSON SUBDIVISION NO. 1  
 14502 HIGHWAY 83  
 EL PASO COUNTY, CO.  
 FOR: DELROY JOHNSON

DRAWN:  
 LLL

DATE:  
 12/18/20

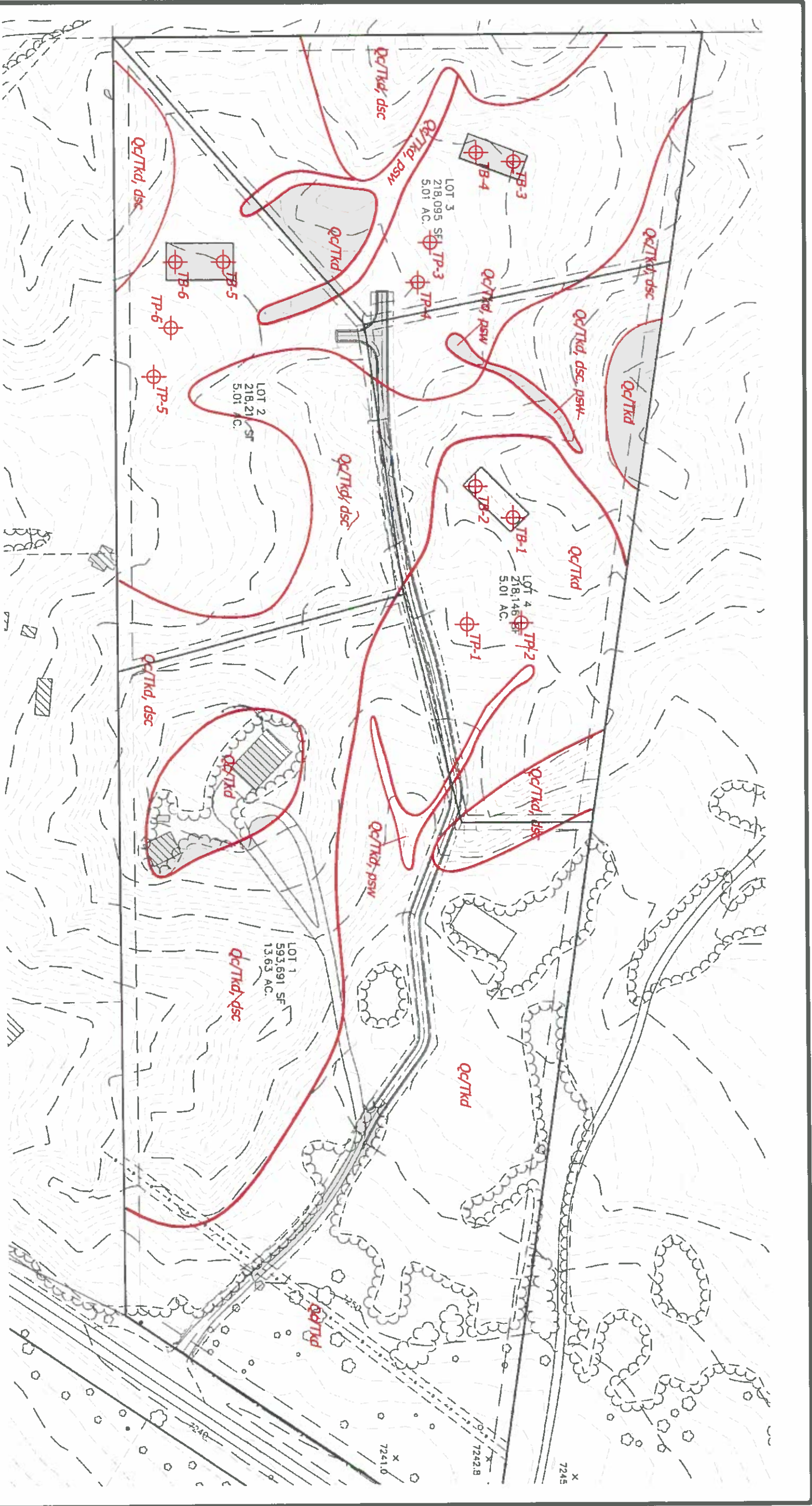
CHECKED:

DATE:

JOB NO.:  
 202746

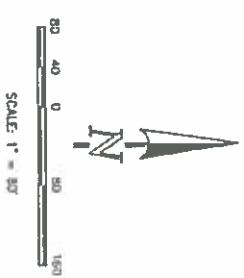
FIG NO.:  
 4





**Legend:**

- Qc/Tkd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age.
- dsc - colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone
- psw - downslope creep
- potentially seasonal shallow groundwater area



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CONSULTING

JOHNSON SUBDIVISION NO. 1			
DESIGNED BY	DATE	SCALE	DATE
DRAWN BY	DATE	SCALE	DATE

**GEOLOGY/ENGINEERING GEOLOGY MAP**  
**JOHNSON SUBDIVISION NO. 1**  
 14502 HIGHWAY 83  
 EL PASO COUNTY, CO.  
 FOR: DELROY JOHNSON

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NO.	DATE	BY	REVISION

DATE	3/31/21
DRAWN	ASB
CHECKED	ASB
DESIGNED BY	ASB
DATE	2/27/21
SCALE	AS SHOWN
PROJECT NO.	2027746
DRAWING NO.	18006
6	



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FEMA FLOODPLAIN MAP  
 JOHNSON SUBDIVISION NO. 1  
 14502 HIGHWAY 83  
 EL PASO COUNTY, CO.  
 FOR: DELROY JOHNSON

DRAWN:  
**LLL**

DATE:  
**12/18/20**

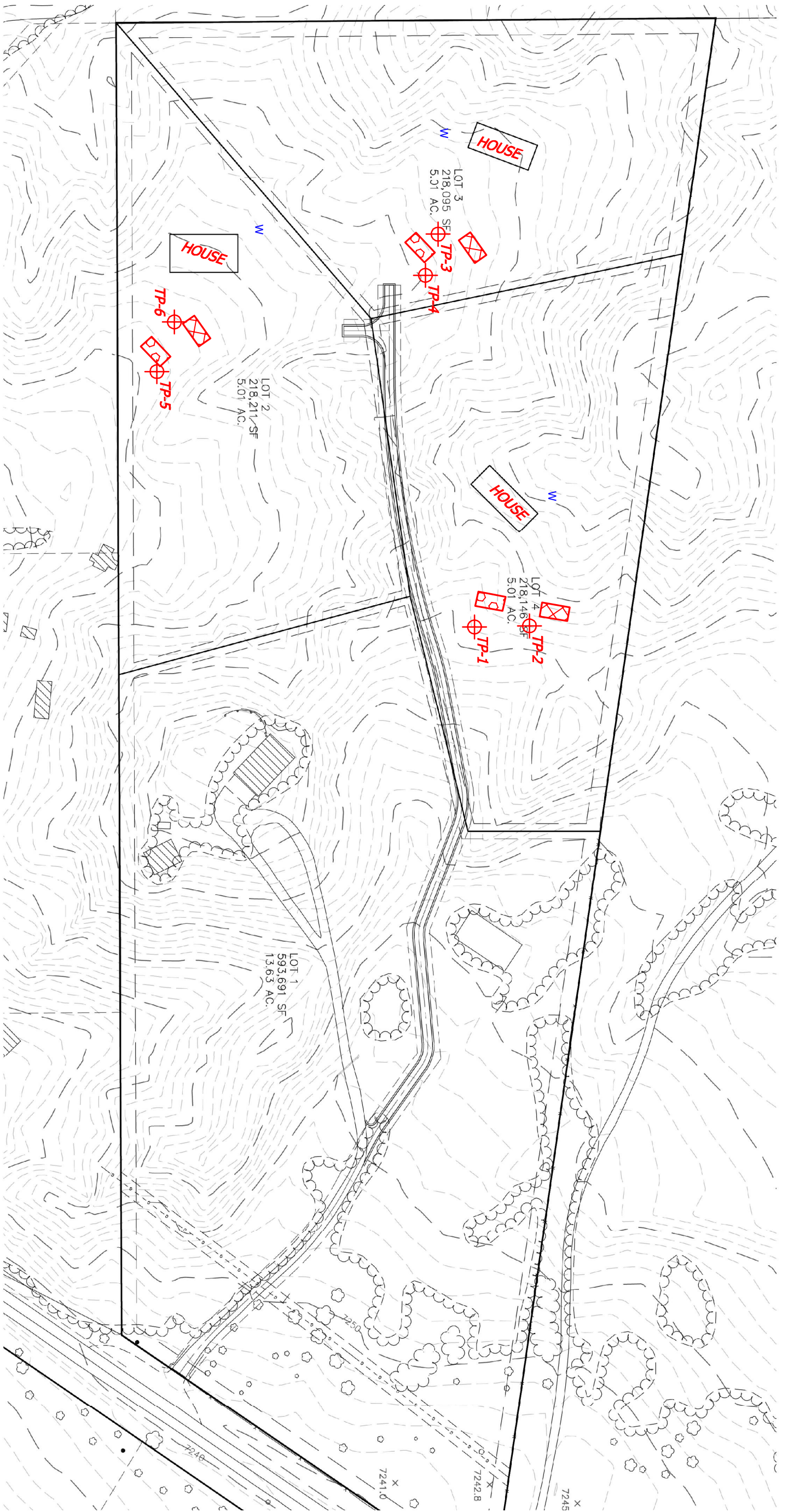
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DATE:

JOB NO.:  
**202746**

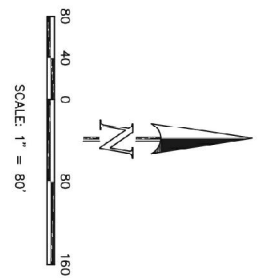
FIG NO.:  
**7**





- LEGEND:**
- POSSIBLE OWTS LOCATIONS
  - POSSIBLE OWTS ALTERNATE LOCATIONS

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



**CLASSIC CONSULTING**

JOHNSON SUBDIVISION NO. 1  
 LOT LAYOUT

DESIGNED BY	MAW	SCALE	DATE
DRAWN BY	...	DATE	...

DATE	12/19/20
SCALE	AS SHOWN
JOB NO.	202746
FIGURE NO.	8

SEPTIC SUITABILITY MAP  
 JOHNSON SUBDIVISION NO. 1  
 14502 HIGHWAY 83  
 EL PASO COUNTY, CO.  
 FOR: DELROY JOHNSON

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REVISION BY	

## **APPENDIX A: Test Pit Logs**

LOT NO. 4  
 TEST PIT NO. 1  
 DATE EXCAVATED 12/9/2020  
 Job # 202746

LOT NO. 4  
 TEST PIT NO. 2  
 DATE EXCAVATED 12/9/2020  
 CLIENT DELROY JOHNSON  
 LOCATION 14502 HWY 83

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
39.043356°, -104.772822° topsoil, sandy loam, brown	1	[Symbol]		gr	w	2A	39.043669°, -104.772816° topsoil, sandy loam, brown	1	[Symbol]		gr	w	2A
sandy loam fine to medium grained, light brown	2	[Symbol]					sandy loam fine to medium grained, light brown	2	[Symbol]				
weathered to formational silty sandstone, fine to medium grained, buff	3	[Symbol]		ma		3A	weathered to formational silty sandstone, fine to medium grained, buff	3	[Symbol]		ma		3A
	4	[Symbol]						4	[Symbol]				
	5							5					
	6							6					
	7							7					
	8							8					
	9							9					
	10							10					

Soil Structure Shape

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

Soil Structure Grade

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



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 COLORADO SPRINGS, COLORADO 80907

**TEST PIT LOG**

DRAWN:

DATE:

CHECKED:  
 LLL

DATE:  
 12/18/20

JOB NO.:  
 202746

FIG NO.:

A-1

LOT NO. 3  
 TEST PIT NO. 3  
 DATE EXCAVATED 12/9/2020  
 Job # 171123

LOT NO. 3  
 TEST PIT NO. 4  
 DATE EXCAVATED 12/9/2020  
 CLIENT DELROY JOHNSON  
 LOCATION 14502 HWY 83

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
39.043419°, -104.774536°							39.043233°, -104.774368°						
topsoil, sandy loam, brown	1	[Symbol]		gr	w	2A	topsoil, sandy loam, brown	1	[Symbol]		gr	w	2A
gravelly, sandy loam fine to coarse grained, light brown	2	[Symbol]					gravelly, sandy loam fine to coarse grained, light brown	2	[Symbol]				
	3	[Symbol]		ma		3A		3	[Symbol]				
weathered to formational silty sandstone, fine to coarse grained, tan	4	[Symbol]					weathered to formational silty sandstone, fine to coarse grained, tan	4	[Symbol]		ma		3A
	5	[Symbol]						5	[Symbol]				
	6	[Symbol]						6	[Symbol]				
	7	[Symbol]						7	[Symbol]				
	8	[Symbol]						8	[Symbol]				
	9	[Symbol]						9	[Symbol]				
	10	[Symbol]						10	[Symbol]				

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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**TEST PIT LOG**

DRAWN:	DATE:	CHECKED: LLL	DATE 12/18/20
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JOB NO.:  
 202746  
 FIG NO.:  
 A-2

LOT NO. 2  
 TEST PIT NO. 5  
 DATE EXCAVATED 12/9/2020  
 Job # 202746

LOT NO. 2  
 TEST PIT NO. 6  
 DATE EXCAVATED 12/9/2020  
 CLIENT DELROY JOHNSON  
 LOCATION 14502 HWY 83

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
39.042266°, -104.77391°							39.042343°, -104.774027°						
topsoil, sandy loam, brown	1	*		gr	w	2A	topsoil, sandy loam, brown	1	*		gr	w	2A
gravelly, sandy loam fine to coarse grained, light brown	2						gravelly, sandy loam fine to coarse grained, light brown	2					
	3							3					
	4							4					
gravelly, loamy sand, fine to coarse grained, light brown	5			sg		1	gravelly, loamy sand, fine to coarse grained, light brown	5			sg		1
	6							6					
	7							7					
	8							8					
	9							9					
	10							10					

Soil Structure Shape

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

Soil Structure Grade

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



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 COLORADO SPRINGS, COLORADO 80907

**TEST PIT LOG**

DRAWN:

DATE:

CHECKED:  
*ELL*

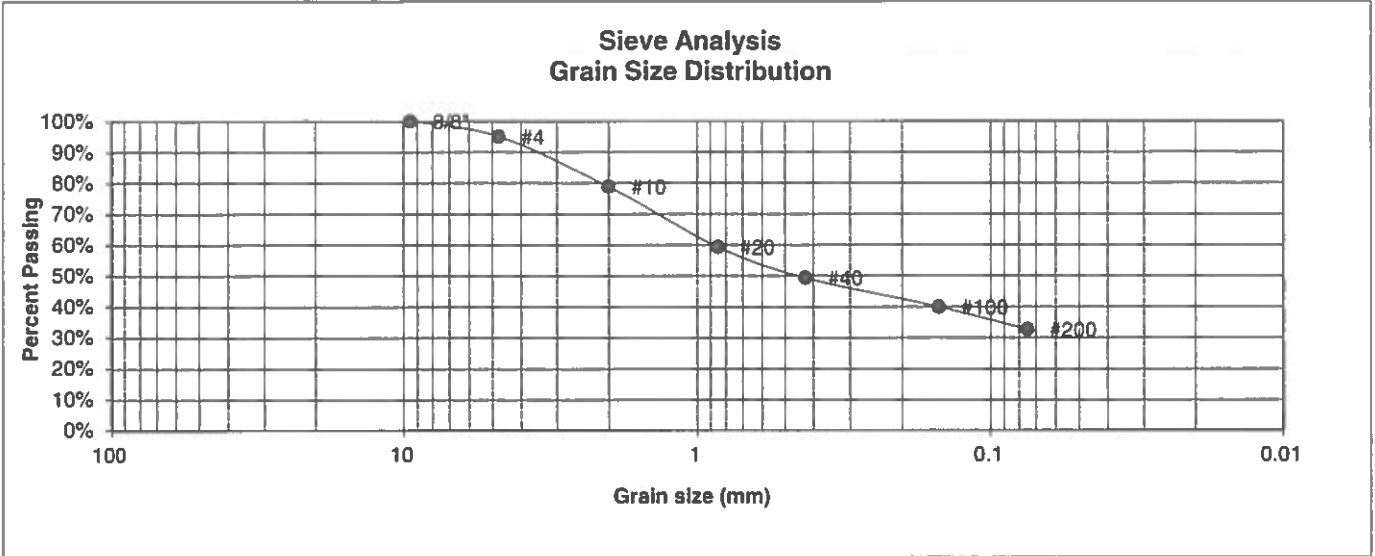
DATE:  
 12/18/24

JOB NO.:  
 202746

FIG NO.:  
 H-3

## **APPENDIX B: Laboratory Test Results**

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	202746
CLIENT	DELROY JOHNSON				
PROJECT	14502 HIGHWAY 83				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.1%
10	78.8%
20	59.3%
40	49.3%
100	40.0%
200	32.7%

Atterberg Limits  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

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



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 COLORADO SPRINGS, COLORADO 80907

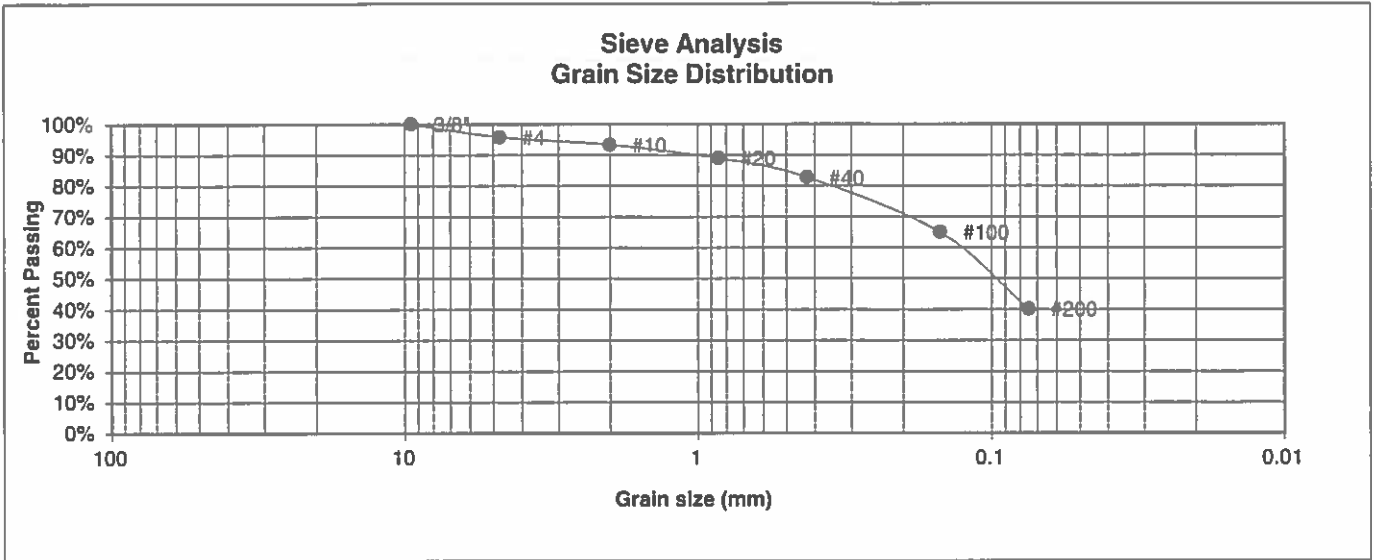
**LABORATORY TEST  
 RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	12/17/20

JOB NO.:  
202746

FIG NO.:  
B-1

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	3-4	AASHTO CLASSIFICATION		JOB NO.	202746
CLIENT	DELROY JOHNSON				
PROJECT	14502 HIGHWAY 83				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.8%
10	93.3%
20	89.0%
40	82.7%
100	65.0%
200	40.1%

**Atterberg Limits**  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

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



**ENTECH**  
**ENGINEERING, INC.**

505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST  
 RESULTS**

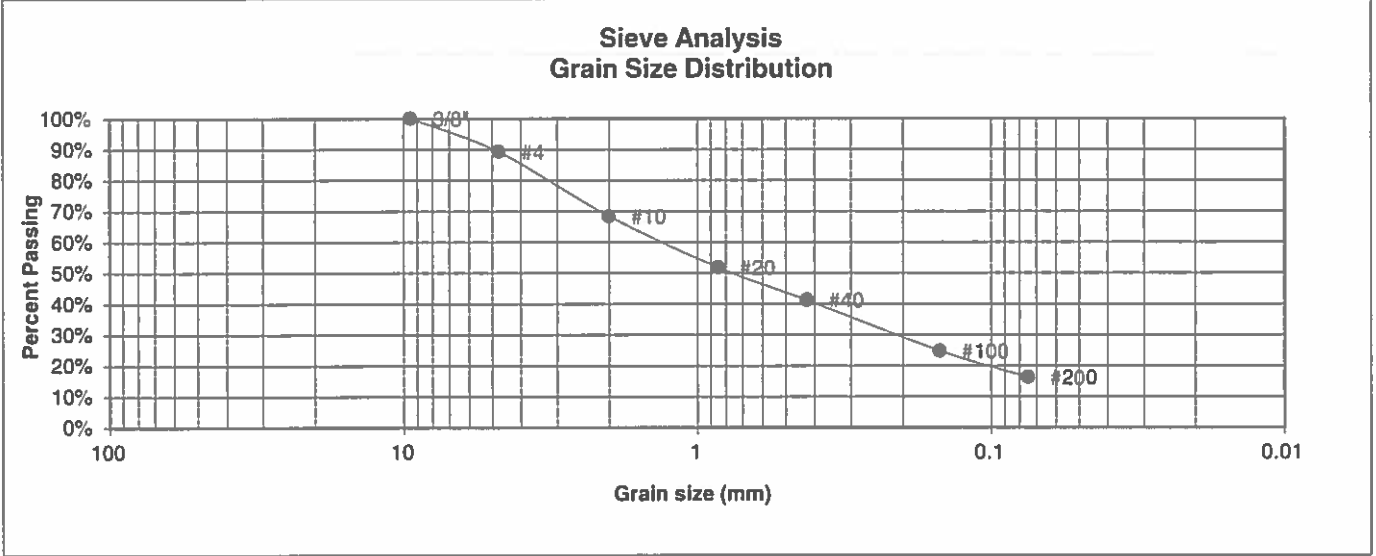
DRAWN:	DATE:	CHECKED: LLL	DATE: 12/17/20
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JOB NO.:  
202746

FIG NO.:  
6-2



BORING NO.	TP-3	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	202746
CLIENT	DELOY JOHNSON				
PROJECT	14502 HIGHWAY 83				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	89.3%
10	68.4%
20	51.8%
40	41.2%
100	24.8%
200	16.2%

**Atterberg Limits**  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

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



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505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

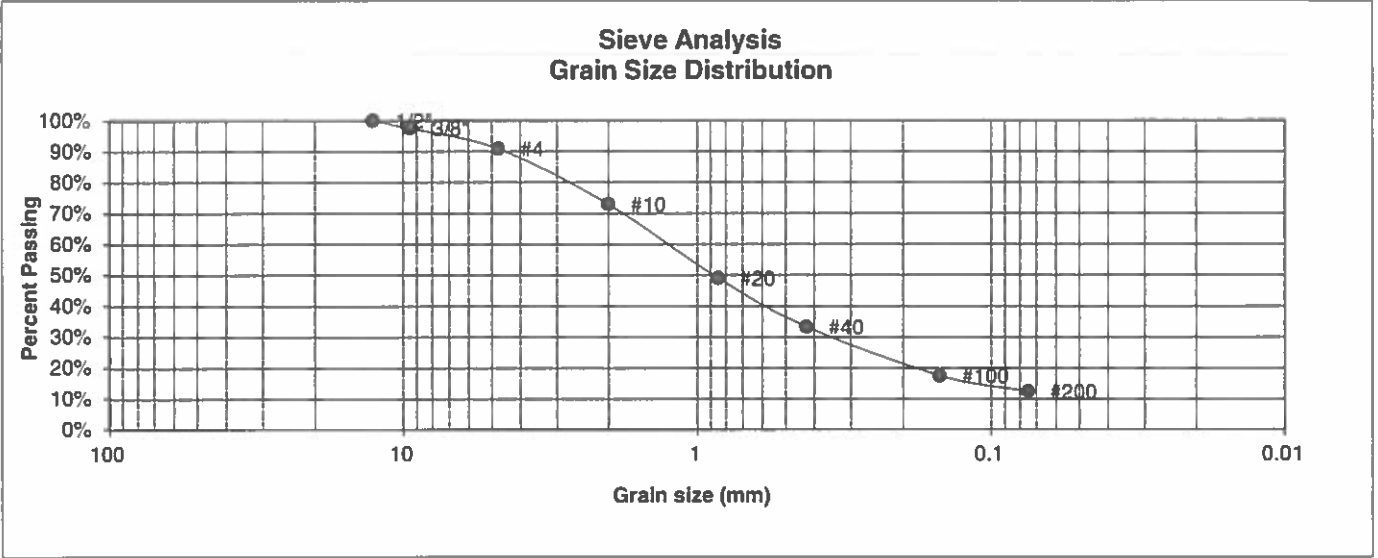
**LABORATORY TEST  
RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	12/17/20

JOB NO.:  
202746

FIG NO.:  
B-3

BORING NO.	TP-4	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	202746
CLIENT	DELROY JOHNSON				
PROJECT	14502 HIGHWAY 83				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.5%
4	90.9%
10	72.9%
20	49.1%
40	33.3%
100	17.5%
200	12.5%

**Atterberg Limits**  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

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



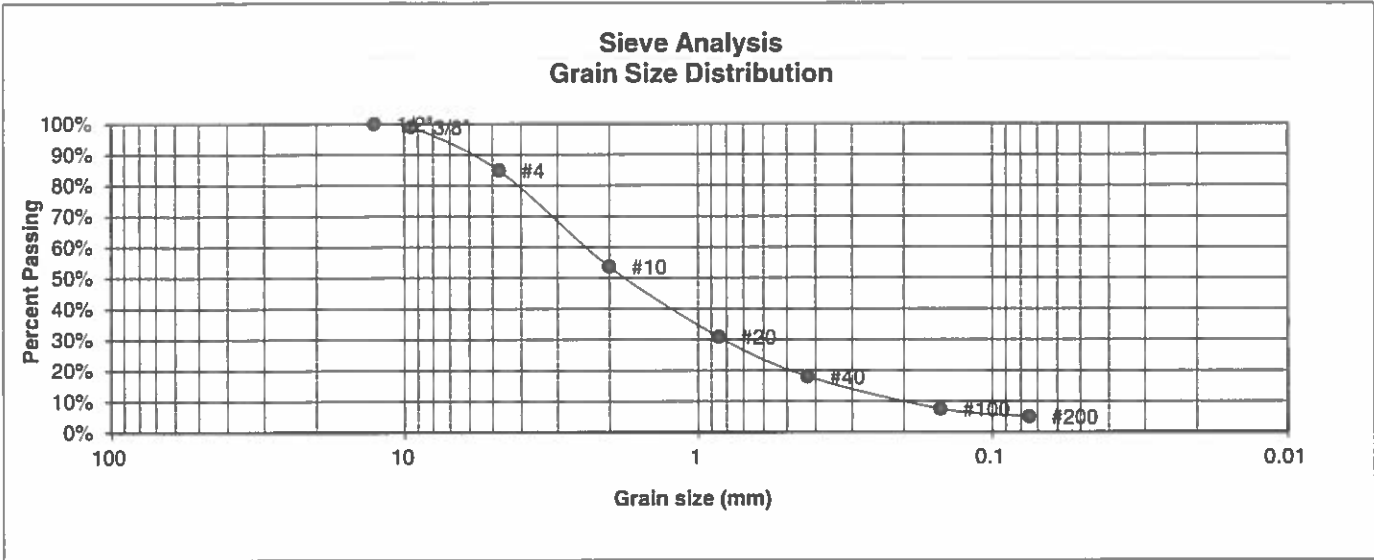
**ENTECH**  
**ENGINEERING, INC.**  
 505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST  
RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	12/17/20

JOB NO.:  
202746  
 FIG NO.:  
B-4

BORING NO.	TP-5	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	202746
CLIENT	DELROY JOHNSON				
PROJECT	14502 HIGHWAY 83				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	99.0%
4	84.8%
10	53.6%
20	30.9%
40	18.0%
100	7.5%
200	5.0%

**Atterberg Limits**  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

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



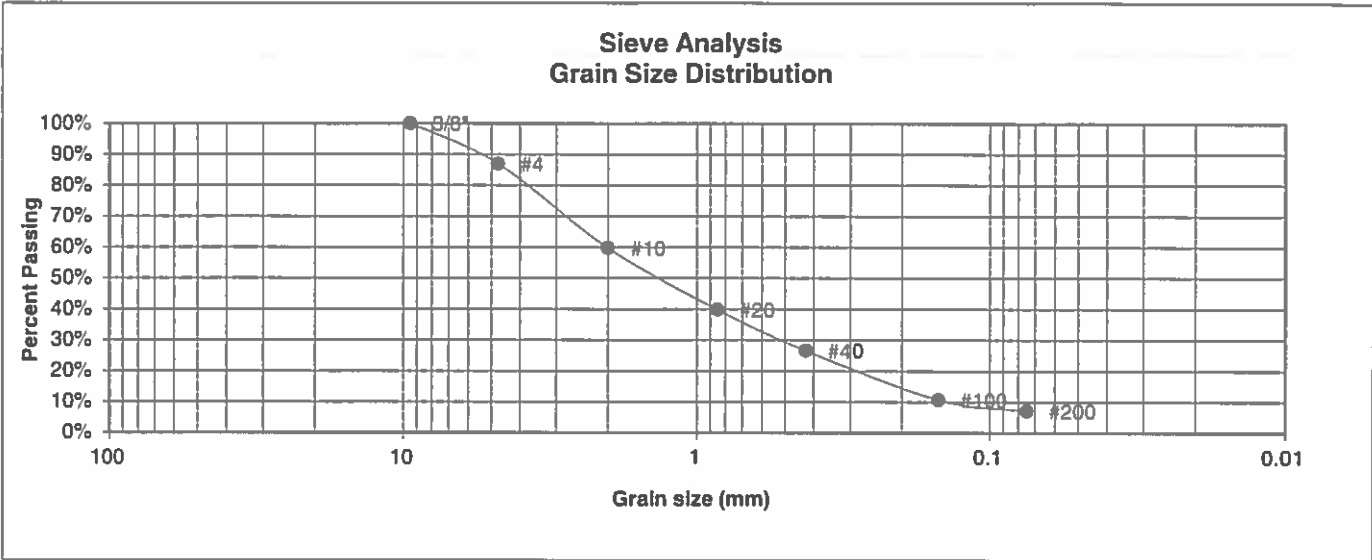
**ENTECH**  
**ENGINEERING, INC.**  
 505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	12/17/20

JOB NO.:  
202746  
  
 FIG NO.:  
B-5

BORING NO.	TP-6	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	202746
CLIENT	DELROY JOHNSON				
PROJECT	14502 HIGHWAY 83				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	87.0%
10	59.7%
20	39.8%
40	26.6%
100	10.7%
200	7.2%

**Atterberg Limits**  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

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



**ENTECH**  
**ENGINEERING, INC.**

505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST  
 RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	12/17/20

JOB NO.:  
 202746

FIG NO.:  
 B-6

## **APPENDIX C: Soil Survey Descriptions**

## 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

*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 capacity:* Low (about 3.4 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7e

*Hydrologic Soil Group:* B

*Hydric soil rating:* No

#### Minor Components

##### Pleasant

*Percent of map unit:*

*Landform:* Depressions

*Hydric soil rating:* Yes

**Other soils**

*Percent of map unit:*

*Hydric soil rating:* No

**Data Source Information**

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 18, Jun 5, 2020

## El Paso County Area, Colorado

### 71—Pring coarse sandy loam, 3 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 369k  
*Elevation:* 6,800 to 7,600 feet  
*Faermland classification:* Not prime farmland

#### Map Unit Composition

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

#### Description of Pring

##### Setting

*Landform:* Hills  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Arkosic alluvium derived from sedimentary rock

##### Typical profile

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

##### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* High  
(2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water capacity:* Low (about 6.0 inches)

##### Interpretive groups

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

#### Minor Components

##### Pleasant

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



**Other soils**

*Percent of map unit:*

*Hydric soil rating:* No

**Data Source Information**

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 18, Jun 5, 2020

**APPENDIX D: El Paso County Health Department Septic Records**

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

Permit # 7963  
Date 9/29/94

APPROVED: YES  NO  # 6100000157 ENVIRONMENTALIST KRUEGER  
Address 14502 ~~14510~~ HIGHWAY 83 Owner DELROY JOHNSON

Legal Description ATTACHED  
Residence , # of bedrooms 6; Commercial ; System Installer KUNAU

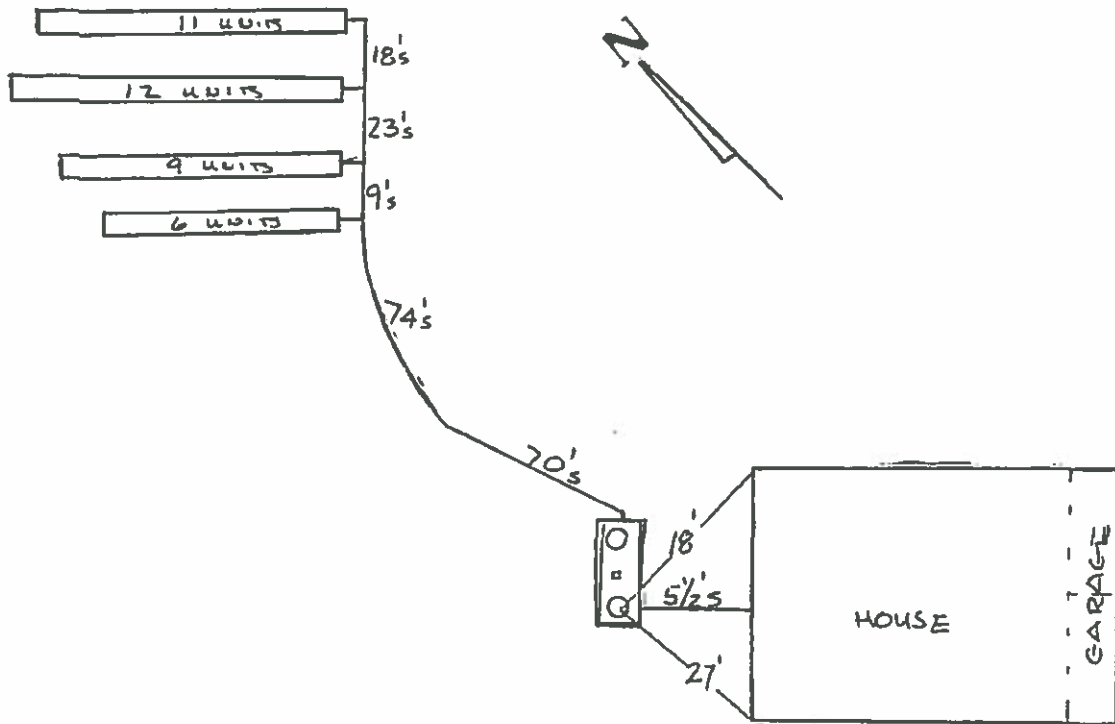
**SEPTIC TANK:**  
Commercial ; Noncommercial , L     , W     , WD       
Construction Material CONCRETE, capacity 2250 gallons.

**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 38, bed     , trench   
sq. ft./section 18, reduction allowed 50%, sq. ft required 1237  
total sq. ft. installed 1368, depth of installation 36"  
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:



• WELL

7963

Permit

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT

301<sup>1/2</sup> South Union Blvd. • Colorado Springs, Colorado • 578-3125

Acres 28.62

Water Supply Well

Receipt No. 5965

PERMIT

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

Issued to Delroy L. Johnson Date 4/12/94

Address of Property 14502 Highway 83 Phone 599-8887

(Permit valid at this address only)

Sewage-Disposal System work to be performed by KLANAU. 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)

4/12/95

DATE OF EXPIRATION

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

SEPTIC TANK:	TRENCH SYSTEM:	BED SYSTEM:	SEEPAGE PIT SYSTEM:
2,000 gallons	23' * total square feet _____ _____ ft. of trench _____ inches wide	total square feet _____ _____ ft. of trench _____ inches wide	total square feet _____ _____ diam. x _____ w/d

*Richard J. ...*  
DIRECTOR, DEPARTMENT OF HEALTH AND ENVIRONMENT  
ENVIRONMENTALIST

NOTES: Stay in perc test location. Meet distance requirements

\*Recommend additional 60%

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.

EHS. ISDS-10-93

David  
578-3132

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

(New)

APPLICATION FOR A PERMIT TO CONSTRUCT, REMODEL, OR INSTALL  
A SEWAGE DISPOSAL SYSTEM

Name of Owner Delroy L. Johnson Daytime Phone 599-8887  
Address of Property 14592 Highway 83, Colo. Spgs, CO 80921 Date 4/7/94  
Legal Description of Property Attached  
Tax Schedule Number 61000 00 157 Septic Contractor/Phone To be bid  
Type of House Construction Wood Frame Source of Water Well  
Size of Lot 28.67 acres Basement (Y) (walkout) Percolation Test Attached (Y) or N)  
MAXIMUM POTENTIAL NUMBER OF BEDROOMS 6

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 & additional tests & reports as may be required by the Department to be made & furnished by the applicant for purposes of evaluating the application, & issuance of the permit is subject to such terms & conditions as deemed necessary to ensure compliance with rules & regulations adopted pursuant to C.R.S. 1973, 10-25-101 et. seq. I hereby certify all statements made, information and reports submitted by me are or will be represented to be true & correct to the best of my knowledge & belief, & are designed to be relied on by the El Paso County Department of Health 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 & in legal action for perjury as provided by law.

OWNER'S SIGNATURE Delroy L. Johnson

\*\*\*\*\*  
DEPARTMENT OF HEALTH USE ONLY

Absorption Area 1237\* Tank Capacity 2000 Date/Site Inspection 4/8/94  
Remarks: STAY IN PERC TEST LOCATION - MEET DISTANCE  
REQUIREMENTS \* RECOMMEND ADDITIONAL 60%

Application is (  ) approved ( ) denied  
Environmentalist Arms Date 4/8/94

\*\*\*\*\*  
Permit # 7963 Receipt # 5965 Date to Planning Dept 4-8-94  
attached (ok)  
sm

PROPERTY AND PERC HOLES MUST BE CLEARLY MARKED/POSTED

The following information must be on your plot plan.  
Please check ( ) the items that apply.

- () Property Lines
- () Property Dimensions
- () Proposed Septic System Site
- () Well(s)
- ( ) Adjacent Well(s)
- () Building(s) ~~(proposed)~~
- ( ) Proposed Building(s)
- ( ) Water Line
- ( ) Cistern
- ( ) Subsoil Drain(s)

Are any of these within 100 feet of your proposed septic system (including adjoining property)? Also draw on the plot plan.

Spring(s) No  
Lake(s) No  
Pond(s) No  
Stream(s) No  
Dry Gulch(s) No  
Natural Drainage Course(s) No

---

Give complete directions to the property from a main highway.

North on Hwy. 83,  $\frac{1}{2}$  mi. North of Northgate Rd.  
28 A. is on west side of Hwy. 83 per plot plan.  
Follow old road ~~(stop on log check gate)~~ <sup>(N/A)</sup> 400', then  
veer off to left up the hill, between orange flags,  
for 500' more. House is on top of hill, 4 corners  
staked with orange flags. Septic field is ~150'  
North, down hill, from house. 3 stakes have orange  
ribbon on them.

