Jesik Consulting
Geotechnical, Water, Testing

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ONSITE WATER TREATMENT SYSTEM SITE AND SOIL EVALUATION AND OWTS DESIGN

For Property at:
11955 Falcon Highway
Falcon, Colorado

Prepared For:
Still Waters Ranch
11955 Falcon Highway

PREPARED BY JESIK
PROJECT NUMBER: 20-8215

Joseph A. Jesik, P.E.

TABLE OF CONTENTS

1. INTRODUCTION

Jesik Consulting has completed an onsite wastewater treatment system (OWTS) site and soil evaluation for the subject property at the request of Dave Smallidge of Still Waters Ranch. Evaluation results and on-site wastewater treatment system recommendations are included for this site.

2. PRELIMINARY SITE REVIEW

A review of available pertinent information including but not limited to property, existing septic system records, and published site data was completed prior to the on-site reconnaissance and detailed evaluation.

2.1. HEALTH DEPARTMENT RECORDS

There was no evidence of a historical OWTS at the location of the proposed event hall, and Health department records are not attached in Appendix A.

2.2. EXISTING SITE PLAN, TOPOGRAPHY AND SOIL INFORMATION

Available site plans and topographic information was reviewed in addition to. Soils information from the Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS).

The preliminary site review did not indicate any specific areas are better suited for an OWTS within the project boundaries.

3. SITE AND SOIL CONDITIONS

Caleb Lewis of Jesik Consulting completed the site reconnaissance and a detailed soil evaluation on February 27, 2020.

3.1. EXISTING FACILITIES

The site was vacant and there were no drinking water wells observed at the time of the site visit.

3.2. SITE CONDITIONS

Vegetation consists of native grasses and weeds. Thick green vegetation or plant species indicative of shallow water were not observed.

Historically, the site appears to have been vacant land.

3.3. SOIL EVALUATION

Caleb Lewis of Jesik Consulting completed a visual and tactile evaluation of 2 soil profile test pits at the proposed soil treatment area.

Test pits were excavated with a backhoe by the owner's representative. Redoximorphic features or other indicators of groundwater were not encountered within 8-feet (ft) of the existing ground surface. Bedrock was not encountered within 8-feet (ft) of the existing ground surface.

Test pit logs and details are presented in Appendix B.

OWTS site and soil evaluation results are summarized below:

- Treatment Level 1
- Recommended OWTS System Type: Engineered
- LTAR: 0.80 gal/day/sf.
- Infiltrative soil/formation: Loamy Sand
- Infiltrative surface depth: 24 - 48 inches

4. OWTS CONSTRUCTION

Hard rock or shallow water conditions are not anticipated at the site. It is not likely that special construction methods or equipment will be required at the site.

Minimum setback distances from OWTS system components to buildings, ponds, drainages and other pertinent features are shown in Table 1.

5. LAND USE CHANGES

A single-family home will be constructed on the site with minor changes to the existing grading. Any additions to the home in the future will require the OWTS system to be evaluated for increased capacity and performance criteria.

6. SITE EVALUATION DIFFICULTIES

There were no site evaluation difficulties.

7. MAINTENANCE AND CARE OF YOUR OWTS SYSTEM

7.1. DO'S & DONT'S

- DO inspect your septic system every year
- DO pump out septic tank every four years
- DO keep records of pumping, inspections and other maintenance
- DO repair leaking faucets and toilets
- DO conserve water to reduce wastewater
- DO divert roof drains and surface water away from the absorption field
- DO call a professional when you have questions
- DON'T drive or park over any part of your septic system
- DON'T use commercial septic tank additives
- DON'T dig or build on top of your septic system

- DON'T plant anything over the absorption field (non-irrigated, native grasses are ok)
- DON'T flush non-biodegradable items into your system, such as diapers, tampons, etc.
- DON'T irrigate the soil treatment area.

7.2. OWTS MAINTENANCE

1. Control the amount of water discharged into the system. Your system is designed to handle a specific amount of water. Larger volumes of water will overload the absorption field. To control the amount of water discharged into the system you should:
   - Repair any leaking faucet or toilet immediately.
   - Divert run-off water from roof eaves, drainpipes and foundation drains away from the absorption field.

2. Normal amounts of these household products will not harm a septic system:
   - Soaps, detergents, and bleaches.
   - Wastewater from a home water softener may cause a slight shortening of the life of the absorption field because of the extra volume of water that's used. The salts from water softeners will not harm the septic system.

3. DO NOT dispose of these items in your system:
   These materials do not decompose in the septic tank: Household items such as facial tissues, tampons, sanitary napkins, cigarette butts, coffee grounds, eggshells, oily waste or grease from cooking, bones, paper towels, newspaper, wrapping paper, rags and disposable diapers.
   Materials such as strong acids, photographic chemicals, and above normal amounts of drain cleaners may upset the biological process in the septic tank.
   Latex paint, wastewater from a pottery hobby and sheet rock mud remain in suspension in the septic tank, and then flow into the absorption field and clog the pores of the soil.

   Note: There are many chemical products for sale that claim to improve the digestion process in the septic tank. Jesik Consulting does not endorse any of these products. With proper care and maintenance, the system should work well without added chemicals.

4. Regularly inspect the level of sludge and scum in the septic tank.

   Jesik Consulting recommends that tanks be inspected once a year.

   The rate at which sludge and scum accumulate in the septic tank varies greatly from one household to the next. It is important to have your tank

inspected regularly (once per year) or if you wish to do this inspection yourself, follow these instructions:

- Before the septic is pumped, measure scum depth
  a. Attach a 6-inch square board to the bottom of a stick about 6 feet long.
  b. At the outlet end of your tank, extend the stick through the scum layer to find the bottom of the baffle or effluent pipe.
  c. Mark your stick to indicate that point.
  d. Raise the stick unit you "feel" or see the bottom of the scum layer.
  e. Mark your stick again to indicate that point.
  f. If the two pencil marks are 3 inches apart or less, or if the scum surface is within 1-inch of the top of the outlet baffle, the tank requires cleaning.

- Measuring sludge depth
  a. Wrap 3-feet of white rag or toweling around a long stick.
  b. Place the stick into the sludge, behind the outlet baffle if possible.
  c. Hold the stick there for several minutes.
  d. Remove the stick noting the sludge line.
  e. If the sludge line is within 12-inches of the outlet baffle, or within 18 inches of the outlet fitting, the tank requires cleaning

- After the septic is pumped
  a. Inspect the Tank for any visible cracking, leaking or worn out parts. It is important that the tank is watertight so that no ground water is getting into the tank nor water from the tank is seeping into the ground.
  b. It is also important to inspect the inlet and outlet pipes for presence of water entering the tank.
  c. The effluent filter (if being used) should also be inspected. Pull out the filter and hose the contents back into the tank.

5. Regularly remove the sludge and scum from the septic tank.

   Sludge and scum must be pumped out of the septic tank before they reach the outlet tee or baffle, or they will flow out into the absorption field and clog the pores of the soil so it can no longer absorb liquid.

   At a minimum, Jesik Consulting recommends that tanks be pumped every four years. Check with your local health department for special requirements.

   Keep your absorption field in good condition.

   Cut grass and weeds growing on the absorption field often.

Absorption fields usually are installed at very shallow depths. Because of this; (1) vehicles must be kept off absorption fields (2) buildings, corrals for livestock, fences and trenches should not be constructed on top of absorption fields and (3) trees and shrubbery should not be planted within or immediately adjacent to the field.

Some septic systems have two or more absorption fields. Valves connect these fields so the wastewater flow can be alternated between fields. If you have such a system, you should switch the diverter valve every summer.

8. LIMITATIONS

In any site evaluation, limited data is available from which to formulate soil descriptions and generate recommendations for onsite wastewater system and related construction components. The observations and testing taken are indicative of the subsurface materials at the time and at the location the samples were taken. Precipitation, seasonal changes, and excavating are just a few of the factors that may create changes in the composition of the site. If conditions are encountered which are significantly different from those described in this report, contact this office before proceeding.

By acceptance of this report all parties agree that the purpose of this report is to provide site and soil data and OWTS recommendations only and does not address nor was intended to address any environmental issues, hazardous materials, mold issues, toxic waste issues or other subsurface situations or conditions other than those described within this report. This report is intended for the sole use of the above named client and their approved agents. This office cannot be responsible for any conclusions or recommendations made by other parties based upon the data contained herein.

TABLES

Jesik Consulting
Geotechnical, Water, Testing

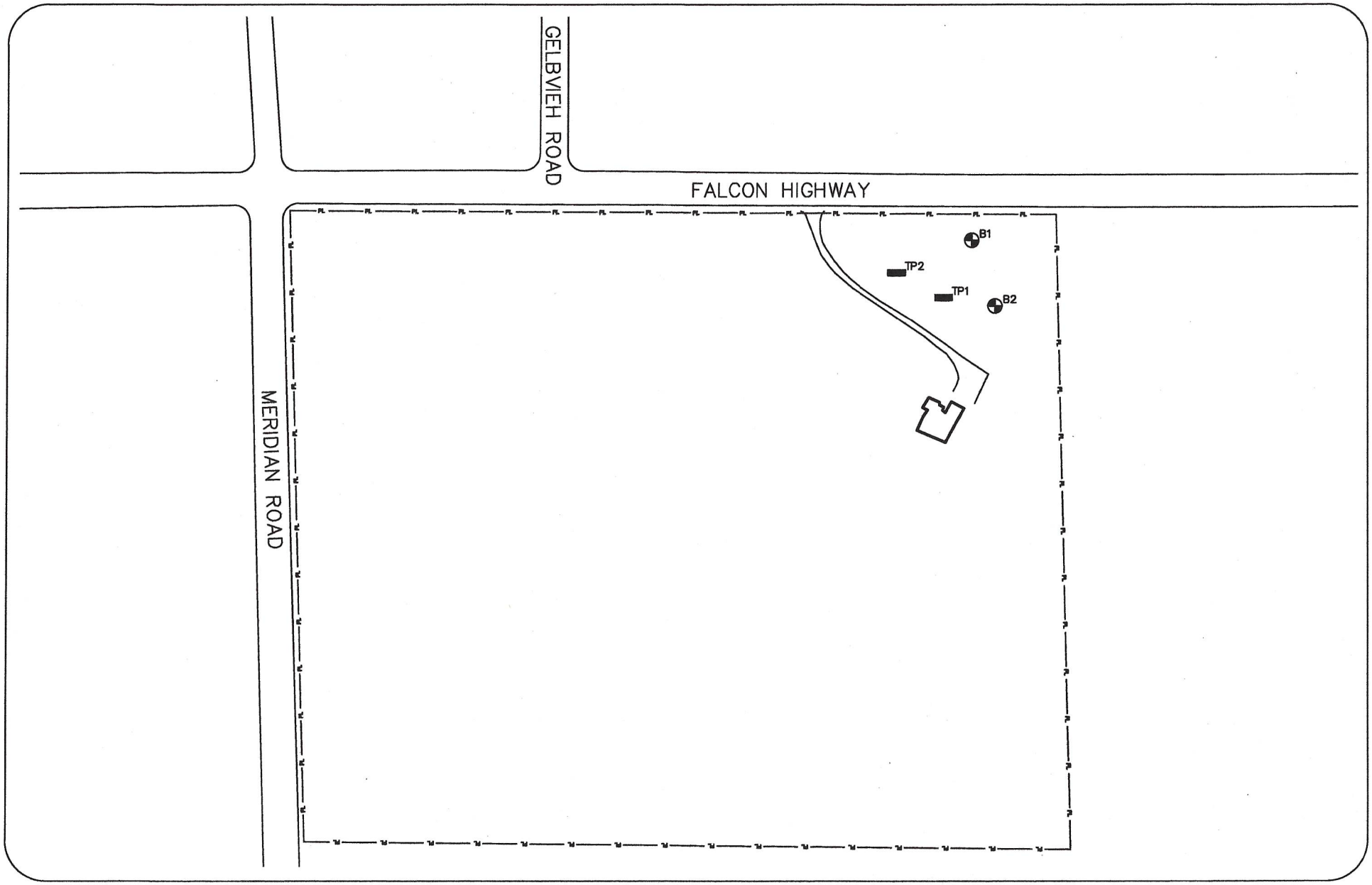
Table 1 – Minimum OWTS Setback Distances (ft)

	Spring, Well	*Potable Water Line*	*Potable Water Cistern*	*Occupied Building*	*Property Line, Piped or Lined Irrigation Ditch*	*Subsurface Drain, Intermittent Irrigation Lateral, Drywell, Storm water Infiltration Structure*	*Lake, Water Course, Irrigation Ditch, Stream, Wetland*	*Dry Gulch, Cut Bank, Fill Area (from Crest)*	*Septic Tank*
Tanks, Vaults Treatment Units	50	10	25	5	10	10	50	10	----
Building Sewer Lines Effluent Lines	50	10	25	0	10	10	50	10	----
STA Trench or STA Bed, Unlined Sand Filter, Sub-surface Dispersal System, Seepage Pit	100[1] 150[2] 200[3]	25	25	20	10	25	50[1,2]	25	5
Lined Sand Filter	60	10	25	15	10	10	25	10	5
Vault Privy	50	10	25	15	10	10	25	10	----
Slit Trench Latrine, Pit Privy	100[1] 150[2]	50	25	----	25	25	100	25	----
Aerosol Methods – No STA	100[1] 150[2]	10	50	125	10	0	25[1,2]	10	10

Notes:

1. Applies to systems in El Paso, Elbert, Douglas, Adams, and Arapahoe counties. Add 8 feet for each 100 gallons/day of design flows between 1,000 and 2,000 gallons per day.
2. Applies to systems in Pueblo County. Add 8 feet for each 100 gallons/day of design flows between 1,000 and 2,000 gallons per day.
3. Applies to systems in Jefferson County. Add 8 feet for each 100 gallons/day of design flows between 1,000 and 2,000 gallons per day.

DRAWINGS



GENERAL NOTES

BORINGS DRILLED FEBRUARY 27, 2020
ALL MEASUREMENTS ARE APPROXIMATE

N

0 50 125 250
1" = 250'

No.	Revision/Issue	Date
JJ	Rev	

Jesik

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SITE INVESTIGATION PLAN FOR:

DAVE SMALLIDGE

11955 FALCON HIGHWAY
FALCON
EL PASO COUNTY, COLORADO

PROJECT NUMBER:	SHEET:
20-8215	SP-1
DATE: 04/08/2020	
SCALE: 1" = 250'	

NOTES AND SPECIFICATIONS:

FIELD SIZE AND CALCULATIONS:

- BASED ON 75 OCCUPANTS FOR AN ASSEMBLY HALL: LOAD 360 gal / day)
- LONG TERM ACCEPTANCE RATE: 0.80 gal / sq. ft / day
- SITE AND SOIL EVALUATION BY: JESIK CONSULTING COMPLETED FEBRUARY 27, 2020
- FIELD TYPE: TRENCH WITH INFILTRATORS
- REQUIRED # OF QUICK 4's: 38

GENERAL SYSTEM NOTES:

- REFER TO LOCAL CODES AND REQUIREMENTS BEFORE INSTALLATION
- SYSTEM MUST BE INSTALLED BY QUALIFIED AND LICENSED INSTALLER
- ANY PORTION OF THE ABSORPTION FIELD MUST BE AT LEAST 150 ft FROM ANY WATER WELL
- SYSTEM MUST BE INSTALLED WITH THE INDICATED NUMBER OF INFILTRATORS, ZONES, AND PIPE LENGTH UNLESS SPECIFIC WRITTEN APPROVAL IS OBTAINED BY THE DESIGN ENGINEER
- ALL LATERALS MUST BE INSTALLED LEVEL. INDIVIDUAL ZONES MAY BE INSTALLED AT DIFFERENT ELEVATIONS. SEE FIELD CROSS SECTION FOR ADDITIONAL INFORMATION.
- A SEWER CLEAN-OUT MUST BE INSTALLED OUTSIDE THE STRUCTURE AND WITHIN FIVE FEET OF THE SEWER EXIT FROM THE FOUNDATION.
- NOT ALL COMPONENTS ARE SPECIFICALLY SHOWN ON THESE PLANS (ELBOWS, VENTS, VALVES, ETC.) AND IT IS ASSUMED THE INSTALLER IS FAMILIAR WITH THE STANDARDS FOR SYSTEM INSTALLATIONS FOR THESE NON-SPECIFIED COMPONENTS.
- THE ABSORPTION FIELD MAY NOT BE USED FOR ANY ACTIVITIES THAT MAY COMPACT THE SOILS, FLOOD THE FIELD, DAMAGE THE PIPES, OR NEGATIVELY IMPACT THE OPERATION OF THE FIELD IN ANY MANNER (LIVESTOCK AREAS, VEHICLE TRAFFIC, CONSTRUCTION AREAS, STORAGE AREAS, ETC.)
- PROPER OPERATION OF THIS SYSTEM IS DEPENDANT ON SENSIBLE WATER AND SYSTEM USAGE. EXCESSIVE WATER USAGE MAY TEMPORARILY, AND EVEN PERMANENTLY DAMAGE THE SYSTEM. IN ADDITION, EXCESSIVE USE OF CHEMICALS AND NON-DEGRADEABLE PRODUCTS CAN HAVE NEGATIVE EFFECTS ON THE BIOLOGICAL BALANCE IN THE STORAGE TANKS. SEE THE "MAINTENANCE AND CARE OF YOUR SEPTIC SYSTEM" FOR ADDITIONAL INFORMATION.

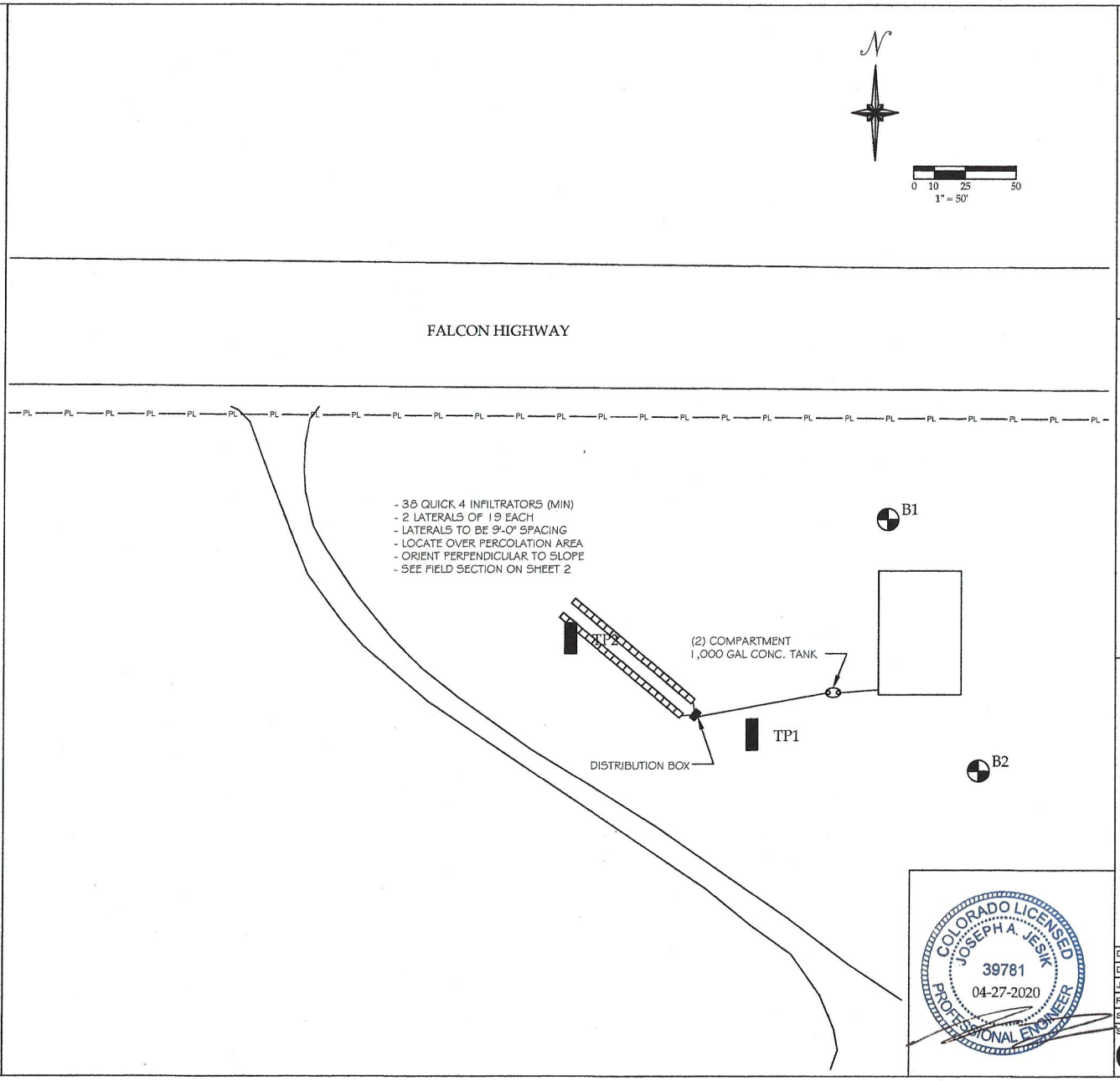
TANK NOTES AND SPECIFICATIONS:

CERTIFICATION:

- TANKS SHOULD BE APPROVED BY THE COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT (CDPHE).

GENERAL TANK NOTES & SPECIFICATIONS:

- TANKS MUST BE NO DEEPER THAN 4 FT FROM THE TOP OF TANK TO THE GROUND SURFACE.
- TOP OF TANKS MUST BE DESIGNED AND CONSTRUCTED TO SUPPORT A MIN 400 PSF UNIFORM LOAD PLUS 2,500 POUND AXLE LOAD. WHEN BURIED MORE THAN 2 FT DEEP, THE TANK SHALL SUPPORT AN ADDITIONAL 100 PSF PER EA FT OF SOIL DEEPER THAN 2 FT.
- TANKS MUST BE INSTALLED PER LOCAL CODE AND THE MANUFACTURERS INSTRUCTIONS.



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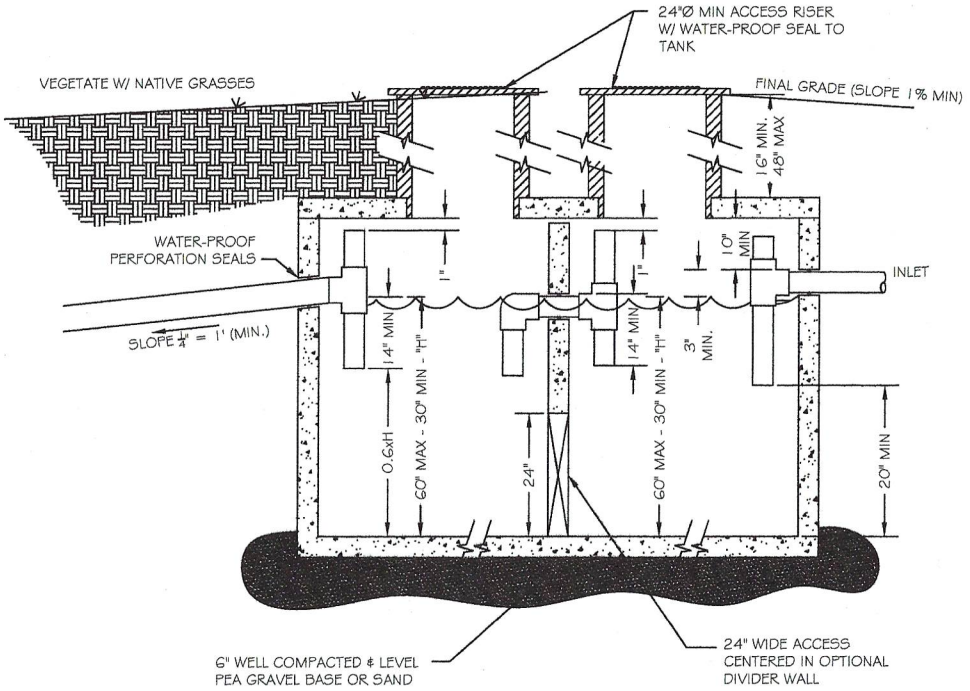
STILL WATERS RANCH

OWTS PLAN FOR:
11955 FALCON HIGHWAY
EL PASO COUNTY, COLORADO

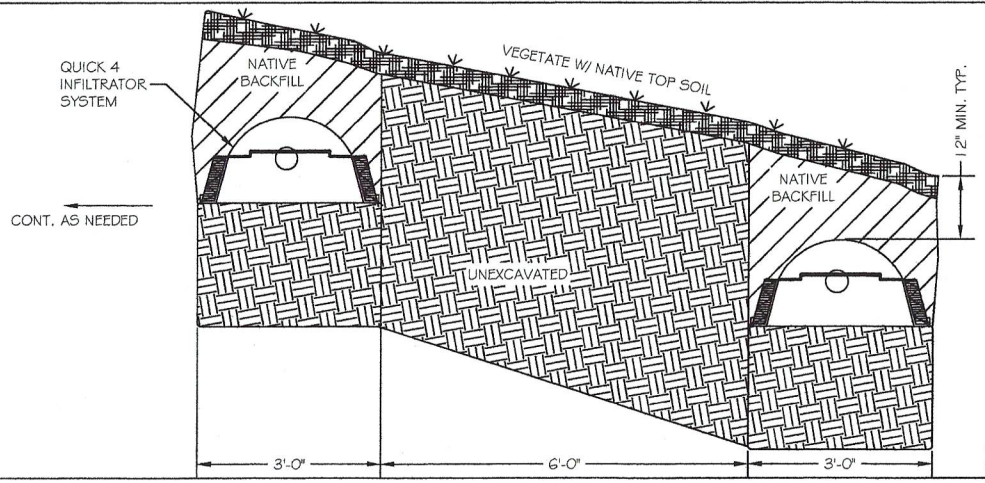
COLORADO LICENSED
JOSEPH A. JESIK
39781
04-27-2020
PROFESSIONAL ENGINEER

Drafted By:	JAJ
Date:	04/27/2020
Job No.:	20-8215
Rev No.:	REV 0
Scale:	1" = 50'
Sheet No.:	OW1



2 COMPARTMENT TANK

SCALE: ¼" = 1'



FIELD CROSS SECTION

SCALE: ¼" = 1'

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STILL WATERS RANCH

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Drafted By:	JAJ
Date:	04/27/2020
Job No.:	20-8215
Rev No.:	REV 0
Scale:	1" = 50'
Sheet No.:	OW2

APPENDIX A: PRELIMINARY STUDY

Soil Map—El Paso County Area, Colorado
(20-8215)

Map Scale: 1:817 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	3.3	100.0%
Totals for Area of Interest		**3.3**	**100.0%**

APPENDIX B: DETAILED SOIL EVALUATION

Project No: 20-8215 Project Name: Smallodge

Test Pit No: 1 Date of Logging: 2/27/20

Soil Depth (BGS)	USDA Soil Texture	USDA Soil Structure Shape	Structure Grade	Redoximorphic Features (Y/N)	Soil Type
8'	Loamy sand	Single grain	0	Y	1

GPS Coordinates: 38°55.435' N, 104°36.200' W

Soil Treatment Area Slope % ~

Is there a limiting condition such as low permeability, bedrock, groundwater, or other condition that restricts the treatment capability of the soil? ☐Yes ☑No

If yes, explain how the limiting condition should be add

Is there evidence of past groundwater (Redoximorphic features)? Yes ☒No

Excavation equipment used: _____

CERTIFICATION

I certify that the information on this form is correct and complete to the best of my knowledge and that I have the required training and/or experience.

Signature: Caleb Lewis

Print Name: Caleb Lewis

Date: 2/27/20

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JOSEPH A. JESIK
39781
04-27-2020
PROFESSIONAL ENGINEER

Jesik Consulting
Form Revision 3/18/19

Project No: 20-8215 Project Name: Smallridge

Test Pit No: 2 Date of Logging: 2/27/20

Soil Depth (BGS)	USDA Soil Texture	USDA Soil Structure Shape	Structure Grade	Redoximorphic Features (Y/N)	Soil Type
81"	Loamy Sand	Single grain	0	Y	1

GPS Coordinates: 38° 55.543' N, 104° 36.218' W

Soil Treatment Area Slope % —

Is there a limiting condition such as low permeability, bedrock, groundwater, or other condition that restricts the treatment capability of the soil? ☐Yes ☑No

If yes, explain how the limiting condition should be add

Is there evidence of past groundwater (Redoximorphic features)? Yes X No

Excavation equipment used:

CERTIFICATION

I certify that the information on this form is correct and complete to the best of my knowledge and that I have the required training and/or experience.

Signature: Caleb Lewis

Print Name: Caleb Lewis

Date: 2/27/20

COLORADO LICENSED JOSEPH A. JESIK 39781 PROFESSIONAL ENGINEER 4-27-2020

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