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SOILS AND GEOLOGY STUDY
TIMBERS AT BLACK FOREST SUBDIVISION
9220 ARROYA LANE
PARCEL NO. 52054-00-041
EL PASO COUNTY, COLORADO

Prepared for:
Timbers at Black Forest Subdivision 2025, LLC
3880 Inspiration Drive
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Attn: Michael Turner

March 5, 2026

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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Entech Job No. 251875
LLL/JCG

PCD No.

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1 SUMMARY

Project Location

The project site is located within the SW¼ of Section 22, Township 12 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located just south of the Palmer Divide and approximately 2 miles north-northeast of Colorado Springs city limits on the southern side of Black Forest. The location of the site is as shown in the Vicinity Map (Figure 1).

Project Description

Timbers at Black Forest Subdivision will consist of twenty rural residential lots the approximately 55-acre parcel. The proposed lots are to be a minimum of 2.5 acres and will be serviced by individual water wells and on-site wastewater treatment systems (OWTS). An existing gravel driveway leads to two existing residences in the eastern portion of the site with a barn, several sheds and outbuildings are currently located on Lots 9 and 10. All existing structures will be removed. Three existing water wells are shown on the site plan located on Lots 11 and 15. The existing residences pre-date septic permitting requirements and existing records were not available through the El Paso County Public Health Department.

Scope of Report

This report presents the results of our geologic evaluation and treatment of engineering geologic hazard study with respect to the proposed subdivision.

Land Use and Engineering Geology

This site was found to be suitable for the proposed development; however, geologic conditions in certain areas will impose some constraints on development and land use. These include areas of artificial fill, potentially expansive soils, shallow bedrock, seasonal shallow and shallow groundwater areas, drainage areas, downslope creep, potentially unstable slopes, and the potential for elevated radon levels. These conditions are discussed in greater detail in this report.

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

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The topography of the site is generally gradually sloping to the southwest with moderate slopes to the west along the Sand Creek drainage in the western portion of the site. The drainage generally flows in southwesterly direction, and water was observed flowing along the Sand Creek drainage, with other drainages on the site dry at the time of this investigation. The site boundaries are indicated in the USGS Map (Figure 2). Previous land uses have included agricultural and rural residential. The site primarily contains field grasses and weeds with Ponderosa Pines along the northern side of the site. Site photographs are included in Appendix A.

Timbers at Black Forest Subdivision will consist of twenty rural residential lots the approximately 55-acre parcel. The proposed lots are to be a minimum of 2.5 acres and will be serviced by individual water wells and on-site wastewater treatment systems (OWTS). The proposed lot configuration and roadway alignment are shown in the Site and Exploration Plan (Figure 3).

3 SCOPE OF THE REPORT

The scope of the report includes a general geologic analysis utilizing published geologic data. Detailed site-specific mapping was conducted to obtain general information with respect to major geographic and geologic features, geologic descriptions, and their effects on the development of the property in accordance with the El Paso Land Development Code.

4 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The site was also evaluated using the Web Soil Survey from the Natural Resource Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS). The position of mappable units within the subject property is shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements and air photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map, which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech on October 22, 2025. Site photographs taken October 22, December are included in Appendix A.

Six (6) test borings were drilled and five (5) tactile test pits were excavated across the project site to determine the classification and engineering characteristics of the soils. The borings were

drilled to depths of 20 feet using a truck-mounted, continuous flight auger drilling rig supplied and operated by Entech, and the test pits were excavated to depths of 5 to 8 feet.

The locations of the test borings and test pits are indicated on the Site and Exploration Plan (Figure 3). The Test Boring and Test Pit Logs are included in Appendix B, and Laboratory Test Results are included in Appendix C. The results of the testing will be discussed later in this report.

Laboratory testing was performed to classify and determine the engineering characteristics of the soils. Laboratory tests included moisture content testing (ASTM D2216), grain-size analysis (ASTM D422), and Atterberg Limits testing (ASTM D4318). Swell testing included one-dimensional swell/consolidation testing. Results of the laboratory testing are included in Appendix C.

4.1 Previous Investigations

Information from the previously completed Entech *Soils and Geology & Wastewater Studies (References 2 through 5)* were used in evaluating the site and are listed below:

- *Soil, Geology, and Geologic Hazard Study, The Retreat at TimberRidge 2.5+ Acre Lots, Vollmer Road and Arroya Lane,* dated April 12, 2017. Entech Job No. 170209.
- *Soil and Geology & Waste Water Study, Retreat at TimberRidge Filing No. 3, Vollmer Road and Arroya Lane, dated June 10, 2022*. Entech Job No. 221106.
- *Soil and Geology & Waste Water Study, Vollmer Road and Arroya Lane, Parcel No. 52214-00-002, dated October 4, 2023*. Entech Job No. 231494.
- *Soil and Geology & Waste Water Study, Retreat at TimberRidge Filing No. 4, Vollmer Road and Arroya Lane, dated October 4, 2023*. Entech Job No. 231468.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

The site lies in the western portion of the Great Plains Physiographic Province just south of the Palmer Divide on the southern side of Black Forest. A major structural feature known as the Rampart Range Fault lies approximately 12 miles to the west. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southeastern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be very gently dipping in a northeasterly direction (Reference 1). The rocks in the area of the site are sedimentary in nature and typically Tertiary to Cretaceous in age. The bedrock underlying the site consists of the Dawson Arkose Formation of Tertiary to

Cretaceous Age. Overlying this formation are unconsolidated deposits of residual, colluvial, alluvial, and man-placed fill of the Quaternary Age. The residual soils are produced by the in-situ action of weathering of the bedrock on site. Some areas of colluvial soils deposited by gravity and sheetwash exist. The alluvial soils were deposited by water along the Sand Creek drainage in the western portion of site and as low terrace deposits along the drainage. Man-placed fill exists as earthen embankments along the drainage in the northern western and north-central portion of the site. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Survey

The Natural Resource Conservation Service (Reference 6), previously the Soil Conservation Service (Reference 7), has mapped three soil types on the site (Figure 4). In general, it is a sandy loam. The soils are described in Exhibit 1 below.

Exhibit 1: Soil Survey Description

Type	Description
40	Kettle gravelly loamy sand, 3 to 8% slopes
41	Kettle gravelly loamy sand, 8 to 40% slopes
71	Pring coarse sandy loam, 3 to 8% slopes

Complete descriptions of each soil type are presented in Appendix D. The soil has generally been described as having moderately high permeabilities. Limitations on development include limited ability to support a load, shrink-swell potential, slopes, and frost action potential. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The soil has been described to have moderate erosion hazards.

5.3 Site Stratigraphy

The Geologic Map of the Black Forest Quadrangle showing the site is presented in Figure 5 (Reference 8). The Geology Map prepared for the site is presented in Figure 6. Four mappable units were identified on this site that are described as follows:

Qaf **Artificial Fill of Quaternary Age:** These are man-placed fill deposits associated with the earthen embankments located on portions of Lots 6, and 11. Fill is likely associated with the existing farm houses, pool, and other structures. Other areas of fill may exist on the site other than those mapped.

Qal **Alluvium of Quaternary Age:** These are modern stream deposits associated with the Sand Creek drainage in the northwestern portion of the site. These materials generally consist of silty to clayey sands and gravel.

Qay_2 **Young alluvium two of late and middle? Holocene Age:** This material is a water-deposited terrace alluvium, typically classified as a silty to well-graded sand, brown to dark brown in color and of loose to moderate density. These deposits can sometimes be very highly stratified containing thin layers of very silty and clayey soil. Young alluvium two is analogous with the Piney Creek Alluvium in the Denver area.

Tkd **Dawson Formation of Tertiary to Cretaceous Age:** The Dawson Formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone, and claystone. Overlying this formation is a variable layer of residual soil. The residual soils were derived from the in-situ weathering of the bedrock materials on-site. These soils consist of clayey sands and sandy clays. Areas of colluvial soils may exist on some of the slopes on site. These materials are derived from the bedrock materials and have been re-deposited by the action of sheetwash and gravity.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Black Forest Quadrangle* distributed by the Colorado Geological Survey in 2003 (Reference 8), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1979 (Reference 9), and the *Geologic Map of the Denver 1^0 x 2^0 Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 10). The Test Borings and Test Pit Logs used in evaluating the site are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

5.4 Soil Conditions

The soils encountered in the test borings drilled on the site can be grouped into two general soil and one rock type. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 classified as a silty to clayey sand (SM, SC). The sand was encountered in the borings at the existing surface and extending to depths of 4 to 13 feet below the existing grade surface (bgs). The sand was encountered at very loose to medium dense to dense states and moist conditions.

Soil Type 2 classified as a sandy clay (CL). The clay was encountered in TB-2 and TB-4 at 5 to 13 feet and extended to depths of 11 to 17 feet bgs. The clay was encountered at soft to stiff consistencies and moist conditions.

Soil Type 3 classified as highly weathered sandstone or dense silty to clayey sand when classified as a soil (SM, SC). The sandstone was encountered in all test borings at depths ranging from the 4 to 17 feet bgs and extending to the termination of the borings (20 feet).

The test boring logs and laboratory test results pertaining to this investigation are included in Appendix B.

5.5 Groundwater

Groundwater was encountered in three of the test borings (TB-1, TB-2, and TB-6) at depths of 10 to 16 feet bgs. The remaining three borings were dry to the depths explored. All of the test borings were drilled to 20 feet. Redoximorphic features were encountered in two of the five test pits (TP-3 and TP-4) at depths of 4 to 6 feet bgs. Areas of potential seasonally shallow groundwater and shallow groundwater have been mapped in the drainages and some low-lying areas on the site. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors including development of the site and surrounding areas.

For the sandy materials on site, it should be noted that some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock or clays. Builders and planners should monitor potential occurrences of such subsurface water features during construction on-site and mitigate as necessary at the time of construction.

6 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

Detailed mapping has been performed on this site to produce a Geology/Engineering Geology Map (Figure 6). This map shows the location of various geologic conditions the developers should monitor during the planning, design, and construction stages of the project. The following constraints/hazards have been identified on the site: artificial fill, potentially expansive soils, shallow bedrock, seasonal shallow and shallow groundwater areas, drainage areas, downslope

creep, potentially unstable slopes, and the potential for elevated radon levels. These constraints and the recommended mitigation techniques include:

Artificial Fill – Constraint

These are recent man-made fill deposits associated with the two earthen embankments located in the northwestern and north-central portions of the site on portions of Lots 6, and 11. At the time of the investigation, the condition of the dams was observed, and appeared to be in good condition. Additional areas of fill associated with the existing farm houses, pool, and outbuilding should be expected. The fill is considered uncontrolled for construction purposes.

Mitigation: The earthen dams lie within defined drainages and should be avoided as building sites. The fill on this site is considered uncontrolled for construction purposes. Any uncontrolled fill encountered beneath foundations will require removal and recompaction at a minimum of 95% of the Modified Procter (ASTM D1557) maximum dry density.

Expansive Soils – Constraint

The site is classified in an area of low swell potential according to the *Map of Potentially Swelling Soil and Rock in the Front Range Urban Corridor, Colorado* by Hart, 1974 (Reference 11). These occurrences are typically sporadic; therefore, none have been indicated on the maps. These clays, if encountered beneath foundations, can cause differential movement in the structure foundation. The sand and sandstone soils are anticipated to exhibit low expansion potentials. If potentially expansive materials are found during excavation, they will need to be mitigated. These occurrences should be identified and mitigated on an individual basis.

Mitigation: Where expansive soils are encountered at or beneath foundation grade; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95% of the Modified Proctor (ASTM D1557) maximum dry density is a suitable mitigation, which is common in the area. Overexcavation depths of 3 to 5 feet may be necessary depending on soil conditions. An alternative mitigation in areas of highly expansive soils is the use of drilled pier foundation systems. Typical minimum pier depths are on the order of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement have been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be made after additional investigation of each building site.

Areas of Erosion - Constraint

These are areas that are undergoing erosion by water and sheetwash producing gullies and rill erosion and are located along the existing gravel driveway on Lots 19 and 20.

Mitigation: Due to the nature of the soils on this site, virtually all the soils are subject to erosion by wind and water. Other minor areas of erosion were observed on site other than those mapped, particularly where some rill erosion has occurred. Areas of erosion can occur across the entire site, particularly if the soils are disturbed during construction. Vegetation reduces the potential for erosion. The areas identified where erosion is actually taking place should be regrading and revegetation using erosion control blankets to anchor and reestablish vegetation. Further recommendations for erosion control are discussed under Section 8.0 "Erosion Control" of this report. Recommendations pertaining to revegetation may require input from a qualified landscape architect and/or the Natural Resource Conservation Service (previously Soil Conservation Service).

Shallow Bedrock – Constraint

Bedrock was encountered in five the test borings at depths ranging from 4 to 17 feet. A Summary of the Depth to Bedrock is included in Table B-1. Shallow bedrock will be encountered in some areas of this site. Where claystone or sandstone are encountered, excavation/grading may be difficult requiring track-mounted excavators. Bedrock will likely be encountered cuts for utility excavations.

Drainage and Floodplain Areas – Constraint

The topography of the site is generally gradually sloping to the southwest with moderate to steep slopes along the Sand Creek drainage in the western portion of the site. The drainage generally flows in southwesterly direction. Areas within the drainages on-site have been identified as areas of seasonally wet and/or seasonally high groundwater areas. Water was observed in the two ponds on-site, and was observed flowing in Sand Creek drainage along the western side of the property. The majority of the drainages across the site were dry. The western site has been mapped as a physiographic floodplain associated with the Sand Creek drainage, however, the site is located just north of the limit of study for the FEMA Map No. 08041CO535G, (Figure 7, Reference 12). The drainage/floodplain area will be avoided by the proposed development on the lots.

The Sand Creek Drainage in the northwest portion of the site has been included in the National Wetlands Inventory as a Freshwater Wetland habitat classified as **R4SBC** (Riverine intermittent – R4; Stream Bed – SB, Seasonally Flooded – C,) (Figure 8, Reference 13). This area lies within a drainage easement and will be avoided by construction.

Potential Seasonally Shallow and Shallow Groundwater Areas – Constraint

The Sand Creek drainage in the western portion of the site, and existing stock ponds have been identified as shallow groundwater areas. The other draianges and minor drainage swales on the site have been identified as potentially seasonal shallow groundwater areas. In these areas, we would anticipate periodic high subsurface moisture conditions and frost heave potential on a seasonal basis. Groundwater was encountered in three of the test borings (TB-1, TB-2, and TB-6) at depths of 10 to 16 feet bgs which were drilled to 20 feet during or subsequent to drilling. The remaining three borings were dry to the depths explored. Redoximorphic features were encountered in two of the five test pits (TP-3 and TP-4) at depths of 4 to 6 feet bgs. Any structures in or adjacent to these areas should follow the mitigation discussed below.

Mitigation: We anticipate that structures will not be located in these zones. Foundations must have a minimum 30-inch depth for frost protection. Buildings should be a minimum of 3 feet above groundwater levels. Subsurface perimeter drains are recommended for any usable below-grade areas including crawlspaces. Should groundwater be encountered within 3 feet of foundation grade, additional drains that could include but are not limited to interceptor drains, underslab drains (capillary break), and overexcavation drains may be needed. Typical drain details are presented in Figures 9 to 11. Any grading in these areas should be done to direct surface flow around construction to avoid areas of ponded water. Structures should not block drainages. All organic material should be completely removed prior to any fill placement. Septic fields should not be placed in areas where there is the potential for shallow groundwater.

Slope Stability and Landslide Susceptibility – Hazard

The majority of the slopes on the site are gradually to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. Portions of the slopes along the Sand Creek drainage along Lots 1 through 6 have been identified as potentially unstable or areas of down slope creep potential. These areas are further discussed below. It is recommended that any future grading or fill slopes be 3:1 or flatter.

Downslope Creep Areas - Constraint

These areas are acceptable as building sites, however, in areas identified with this hazard classification, we would anticipate accelerated lateral and vertical movement of the near surface soils in the downslope direction. Downslope creep has been identified on portions of Lots 5 through 7.

Mitigation: The design of foundations in these areas should account for the additional pressure on the uphill side of the structure due to the creep potential. The lateral pressure distribution for sloping conditions in downslope creep area is presented in Figure 12. Tie-beams, buttresses and counterforts may be necessary in some areas. Where possible, in areas of downslope creep, structures should be designed to be as compact and rigid as possible. This will help them better tolerate the vertical and lateral movements to which the foundation system may be subjected with minimal damage. Long, rambling, irregular structures should be avoided, as they are associated with much greater potential for damaging differential movement. Additionally, structures should be designed to step up the slope. Deep cuts in these areas should be avoided. Any retaining walls proposed in these areas should also be properly designed for by a qualified professional engineer for the global slope stability. Proper control of drainage at both the surface and subsurface is important. Saturation of materials should be avoided that may create unstable conditions.

Potentially Unstable Slope Areas - Hazard

These slopes are considered stable in their present condition; however, considerable care must be exercised in these areas not to create a condition which would tend to activate instability. These areas are primarily located along the banks of Sand Creek, which are proposed as open space.

Mitigation: Building should be avoided in these areas. Proper control of drainage at both the surface and the subsurface is extremely important. Areas of ponded water at the surface should be avoided. Utility trenches, basement excavations and other subsurface features should not be permitted to become water traps which may promote saturation of the subsurface materials. Drainage should not be permitted over the potentially unstable slope but directed in a non-erosive manner away from the slope. Irrigation above these slopes should be kept to a minimum to prevent saturation of the subsurface soils. The use of xeriscape landscaping utilizing native plantings is recommended to reduce the need for irrigation.

Debris Flow Susceptibility – Hazard

The site is not located within an area of debris flow susceptibility according to the *Debris Flow Susceptibility Map of El Paso County, Colorado* by McCoy et al. in 2018 (Reference 14).

Radon – Hazard

Radon is a colorless, tasteless radioactive gas with a United States Environmental Protection Agency (EPA) specified action level of 4.0 picocuries per liter (pCi/L) of air. Radon gas has a very short half-life of 3.8 days. Radon levels for the area have been reported by the Colorado Geologic Survey in the open file, Report No. 91-4 (Reference 15). The average radon level for the 80908 zip code is 3.40 pCi/l. The following is a table of radon levels in this area:

Average Radon Levels for the 80908 Zip Code	
0 < 4 pCi/L	50.00%
4 < 10 pCi/L	50.00%
10 < 20 pCi/L	0.00%
> 20 pCi/L	0.00%

Mitigation: The potential for high radon levels is present for the site. Build-up of radon gas can usually be mitigated by providing increased ventilation of basement and crawlspace and sealing joints. **Specific requirements for mitigation should be based on site specific testing.**

6.1 Relevance of Geologic Conditions to Land Use Planning

We understand that the development will be rural residential. It is our opinion that the existing geologic and engineering geologic conditions will impose some minor constraints on the proposed development and construction. The most significant problems affecting development will be those associated with the drainages and potential shallow groundwater on site which can be avoided or mitigated. Other hazards on site may be satisfactorily mitigated through proper engineering design and construction practices.

The upper granular soils were encountered at very loose medium dense to dense states. The granular soils encountered in the upper soil profiles of the test borings should provide good support for foundations. Foundations anticipated for the site are standard spread footings on granular soils or in conjunction with overexcavation in areas of expansive soils. Areas containing sands and arkosic sandstone will have high allowable bearing conditions. Difficult excavation should be anticipated in areas of shallow bedrock.

Expansive layers may be encountered in the soil and bedrock on this site. Areas of expansive soils encountered on site are sporadic; therefore, none have been indicated on the maps. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development. Bearing capacities of 2000 to 2400 psf for granular soils or structural fill, and 3000 to 3500 psf for undisturbed sandstone are anticipated. Site-specific subsurface investigations will need to be conducted and recommendations provided prior to construction.

Subsurface perimeter drains are recommended for any below-grade usable areas including crawlspaces. Should groundwater be encountered within 3 feet of foundation grade, additional drains may include interceptor drains, under slab drains (capillary break), and overexcavation drains. Typical drain details are presented in Figures 9 – 11. Specific recommendations should be made once building plans/locations have been determined and additional site investigation is completed.

Records for the old septic systems could not be located. The old systems if encountered in building areas will require removal. Existing foundation or utility components associated with the existing structures on the site should be completely removed.

In summary, development of the site can be achieved if the items mentioned above are mitigated. These items can be mitigated through proper design and construction or through avoidance. Investigation of the individual lots and building sites is recommended prior to construction.

7 ECONOMIC MINERAL RESOURCES

Some of the sandy materials on site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 16), portions of the area are mapped as stream terrace deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 17), areas of the site are not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 18), the area of the site has been mapped as “Good Potential” for industrial minerals. It is possible that sand materials on site could be an aggregate resource. However, considering the silty to clayey nature of many of these materials, the abundance of similar materials throughout the region, and the proximity to developed land, they would be considered to have little significance as an economic resource.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 18), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as “Poor” for coal resources. No active or inactive mines have been mapped near the site. No metallic mineral resources have been mapped on the site (Reference 18).

The site has been mapped as “Fair” for oil and gas resources (Reference 17). No oil or gas fields have been discovered near the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, they may not be considered a significant resource. Hydraulic fracturing is a new method used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health, and safety.

8 EROSION CONTROL

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

Regarding water erosion, loosely compacted soils will be the most susceptible to water erosion; residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of synthetic channel lining materials available on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities as well as provide small

traps for containing sediment. The determination of the amount, location, and placement of ditch linings, check dams, and special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

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

9 ROADWAY, EMBANKMENT, and STORMWATER DETENTION FACILITY CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for the proposed roadway, embankments, and detention facilities. Groundwater may be encountered along drainages and low-lying areas. If excavations encroach on the groundwater level, unstable soil conditions may be encountered. Excavation of saturated soils will be difficult with rubber-tired equipment. Stabilization using shot rock or geogrids may be necessary.

Any areas to receive fill should have all topsoil, organic material, or debris removed. Prior to fill placement, Entech should observe the subgrade. Fill must be properly benched and compacted to minimize potentially unstable conditions in slope areas. Fill slopes should be 3:1 or flatter. The subgrade should be scarified and moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% of the Modified Proctor (ASTM D1557) maximum dry density prior to placing new fill. Areas receiving fill may require stabilization with rock or fabric if shallow groundwater conditions are encountered.

New fill should be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95% of the Modified Proctor (ASTM D1557) maximum dry density. These materials should be placed at a moisture content conducive to compaction, usually 0 to +/-2% of the Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech during construction. Entech should approve any imported materials prior to placing or hauling them to the site. Additional investigation will be required for pavement designs once roadway grading is completed and utilities are installed.

10 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some constraints on development and construction of the site. The majority of these conditions 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. Construction and design personnel should be made familiar with the contents of this report. Additional investigation is recommended as plans are generated prior to construction on individual building sites.

This report has been prepared for Timbers at Black Forest Subdivision 2025, LLC for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty, expressed or implied, is made.

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

11 REFERENCES

1. Bryant, Bruce, McGrew, Laura W., and Wobus, Reinhard A. 1981. *Geologic Structure Map of the Denver 1º x 2º Quadrangle, North-Central Colorado*. U.S. Geologic Survey. Map 1-1163.
2. Entech Engineering, Inc. April 12, 2017. *Soil, Geology, and Geologic Hazard Study, The Retreat at TimberRidge 2.5+ Acre Lots, Vollmer Road and Arroya Lane, El Paso County, Colorado.* Entech Job No. 170209.
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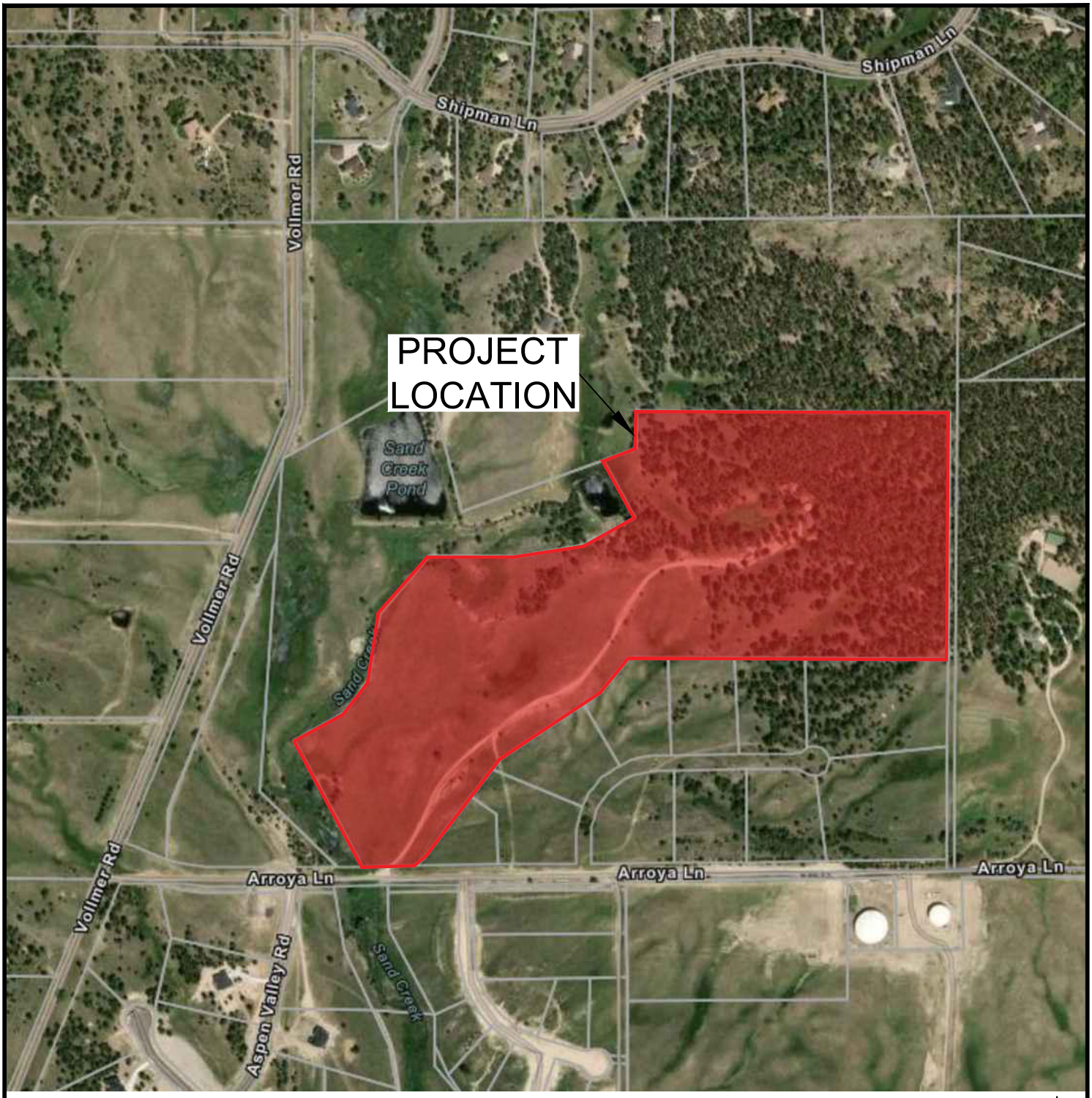
FIGURES



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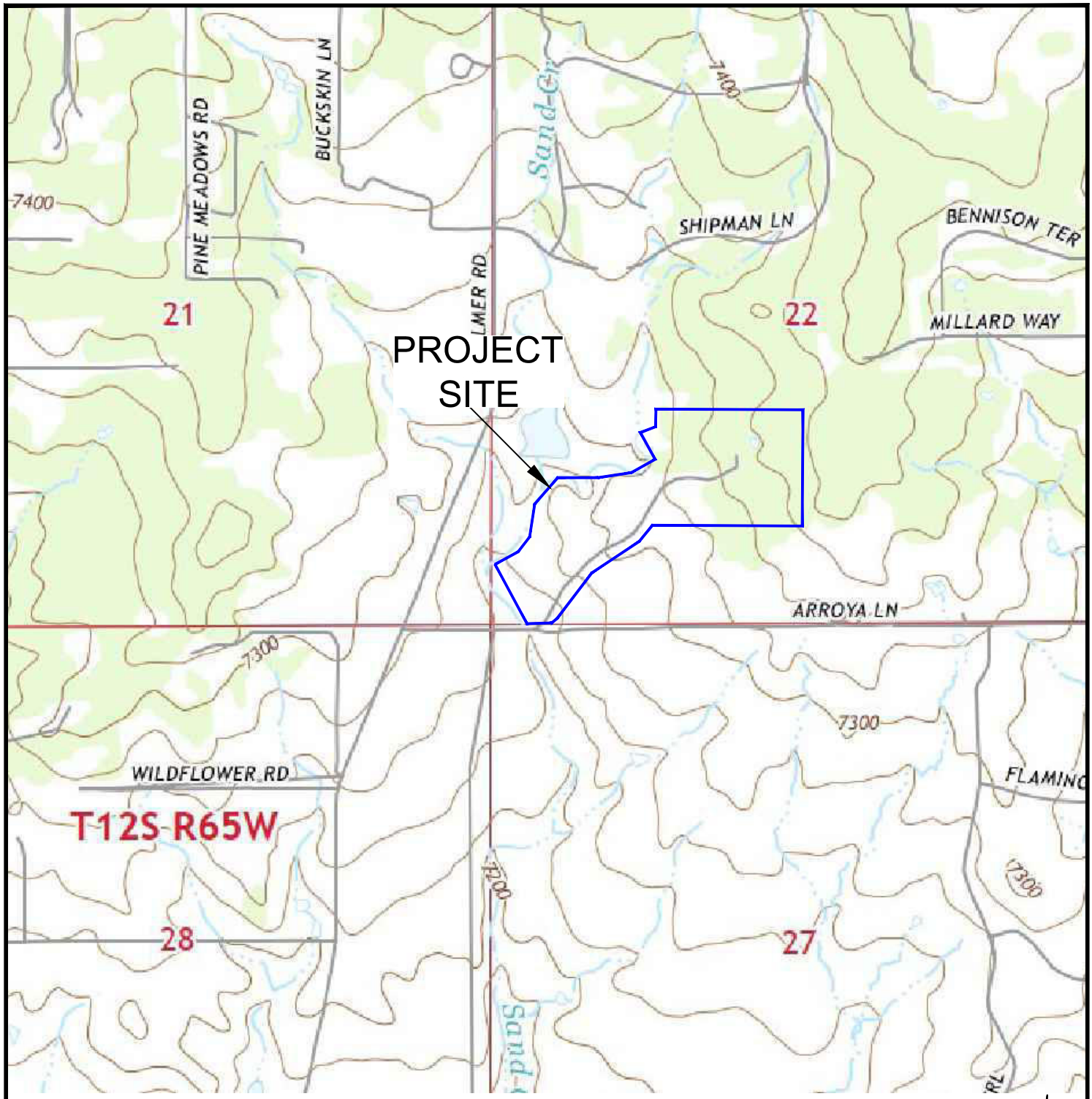
VICINITY MAP

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 1



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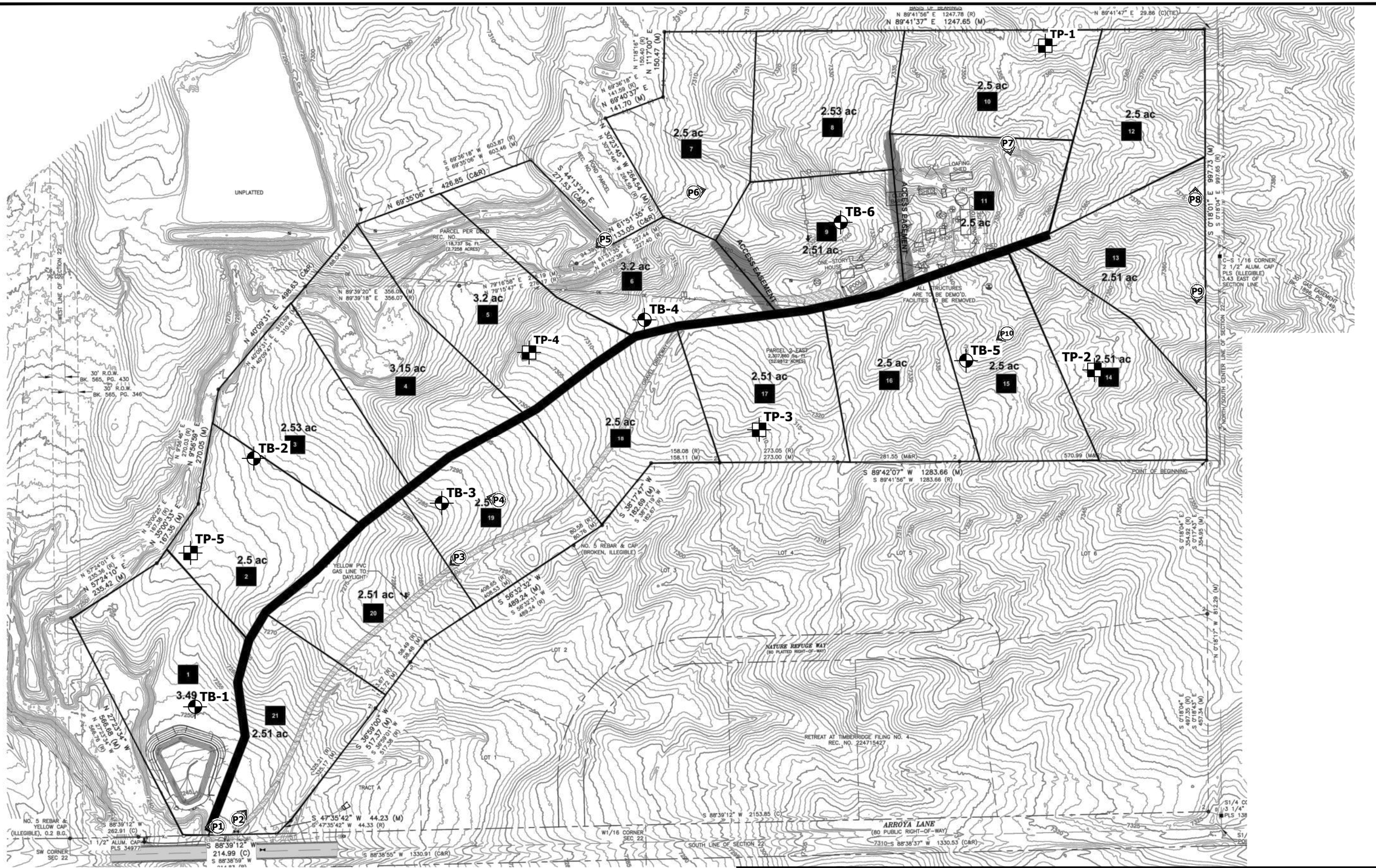
USGS TOPOGRAPHY MAP

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 2



- APPROXIMATE TEST PIT LOCATION AND NUMBER
- APPROXIMATE TEST BORING LOCATION AND NUMBER
- APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

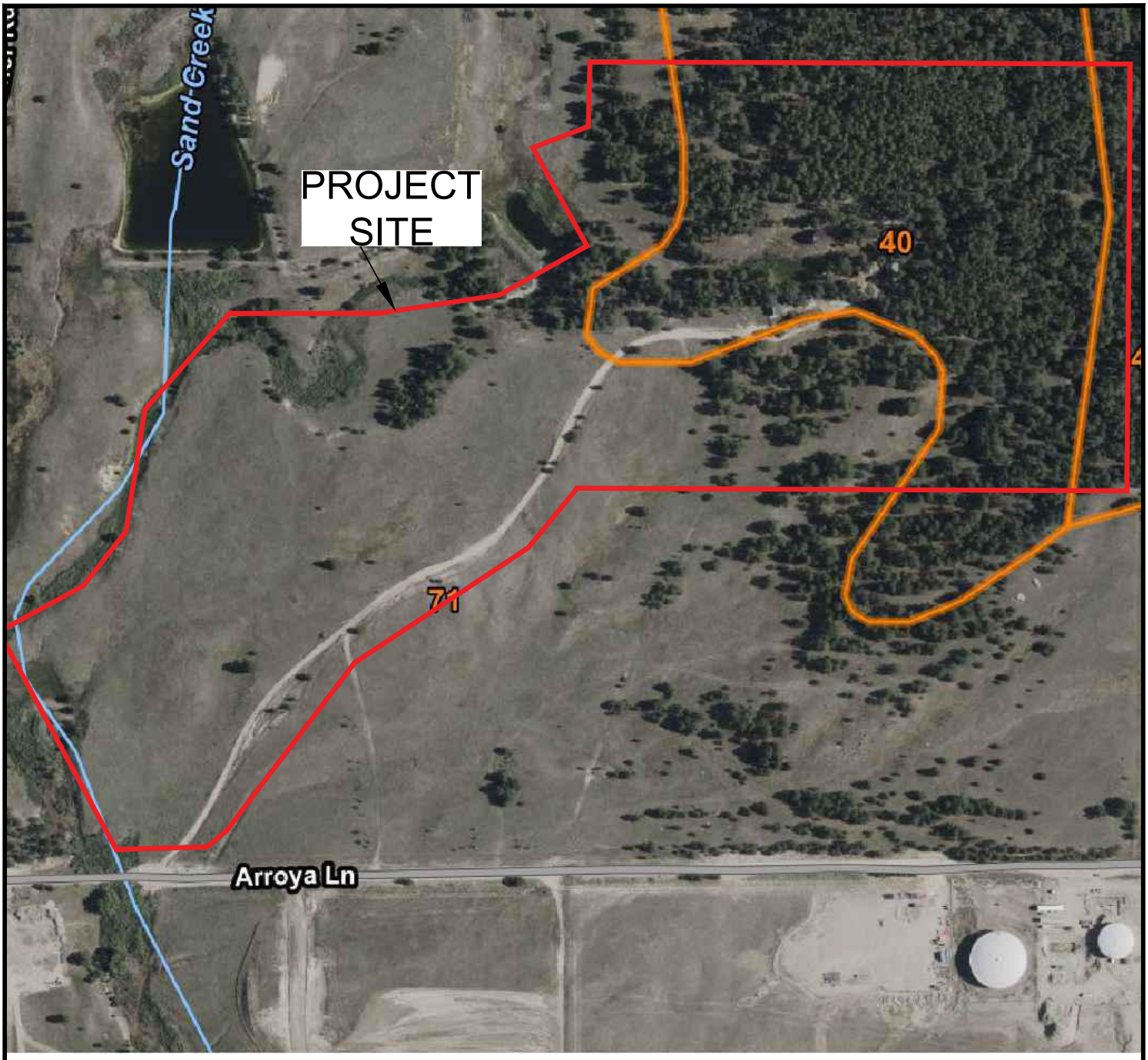
ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN

9220 ARROYA LANE
TIMBERS AT BLACK FOREST SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 3



N

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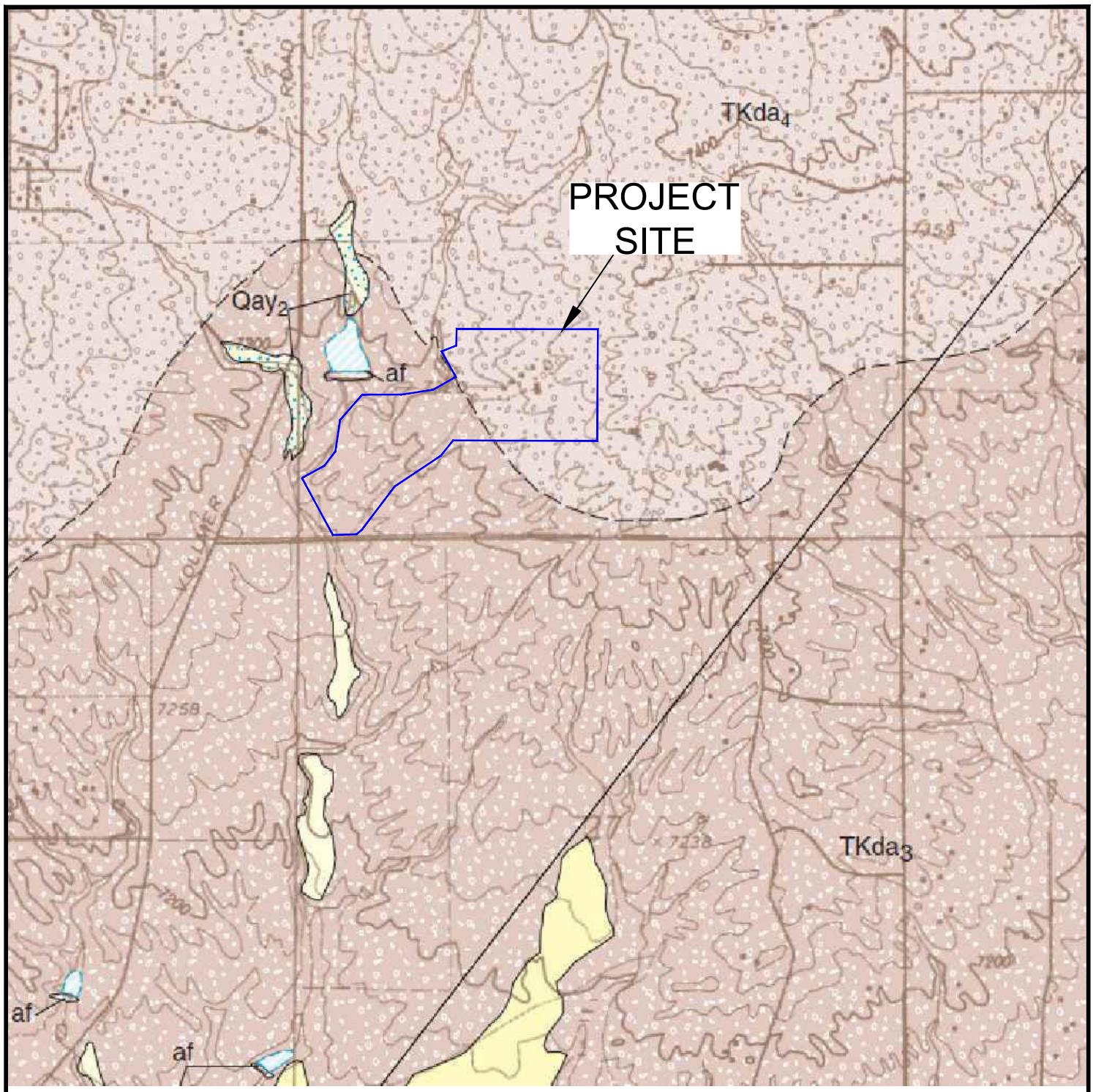
SOIL SURVEY MAP

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 4



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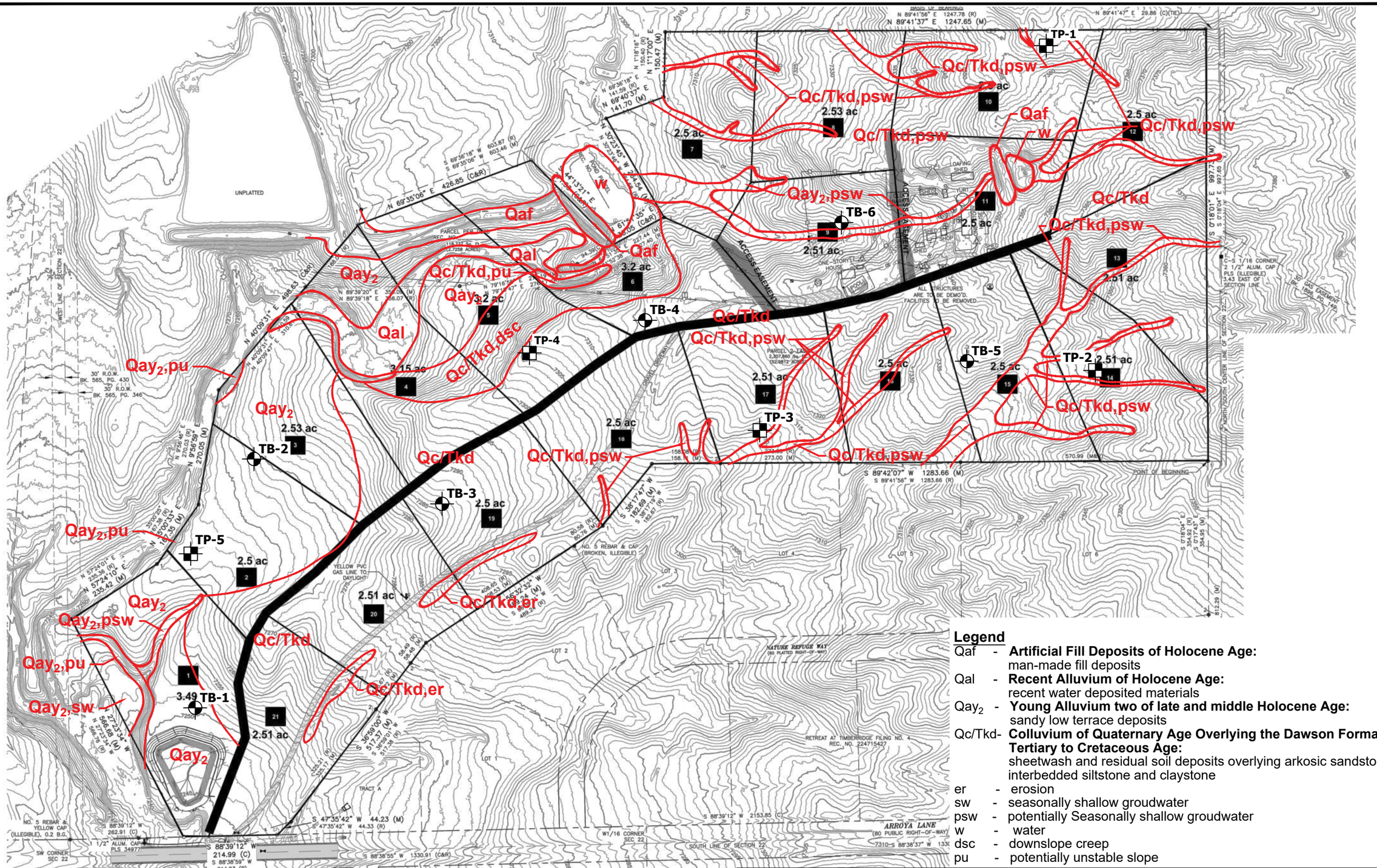
GEOLOGIC MAP OF THE COLORADO SPRINGS QUADRANGLE
9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 5



Legend

Qaf	-	**Artificial Fill Deposits of Holocene Age:** man-made fill deposits
Qal	-	**Recent Alluvium of Holocene Age:** recent water deposited materials
Qay_2	-	**Young Alluvium two of late and middle Holocene Age:** sandy low terrace deposits
Qc/Tkd-		**Colluvium of Quaternary Age Overlying the Dawson Formation of Tertiary to Cretaceous Age:** sheetwash and residual soil deposits overlying arkosic sandstone with interbedded siltstone and claystone
er	-	erosion
sw	-	seasonally shallow groudwater
psw	-	potentially Seasonally shallow groudwater
w	-	water
dsc	-	downslope creep
pu	-	potentially unstable slope

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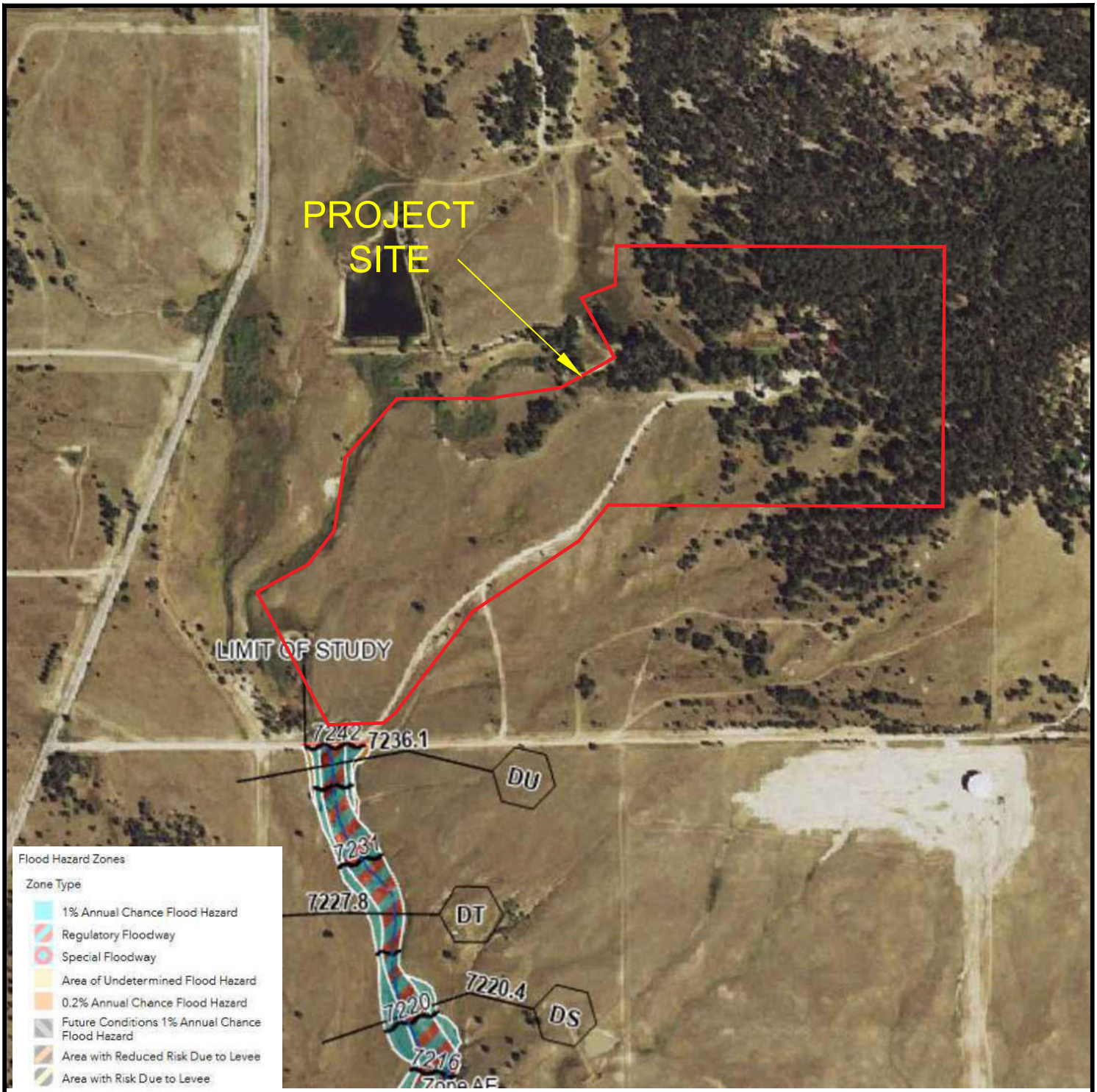
GEOLOGY / ENGINEERING
GEOLOGY MAP
9220 ARROYA LANE
TIMBERS AT BLACK FOREST SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 6



N

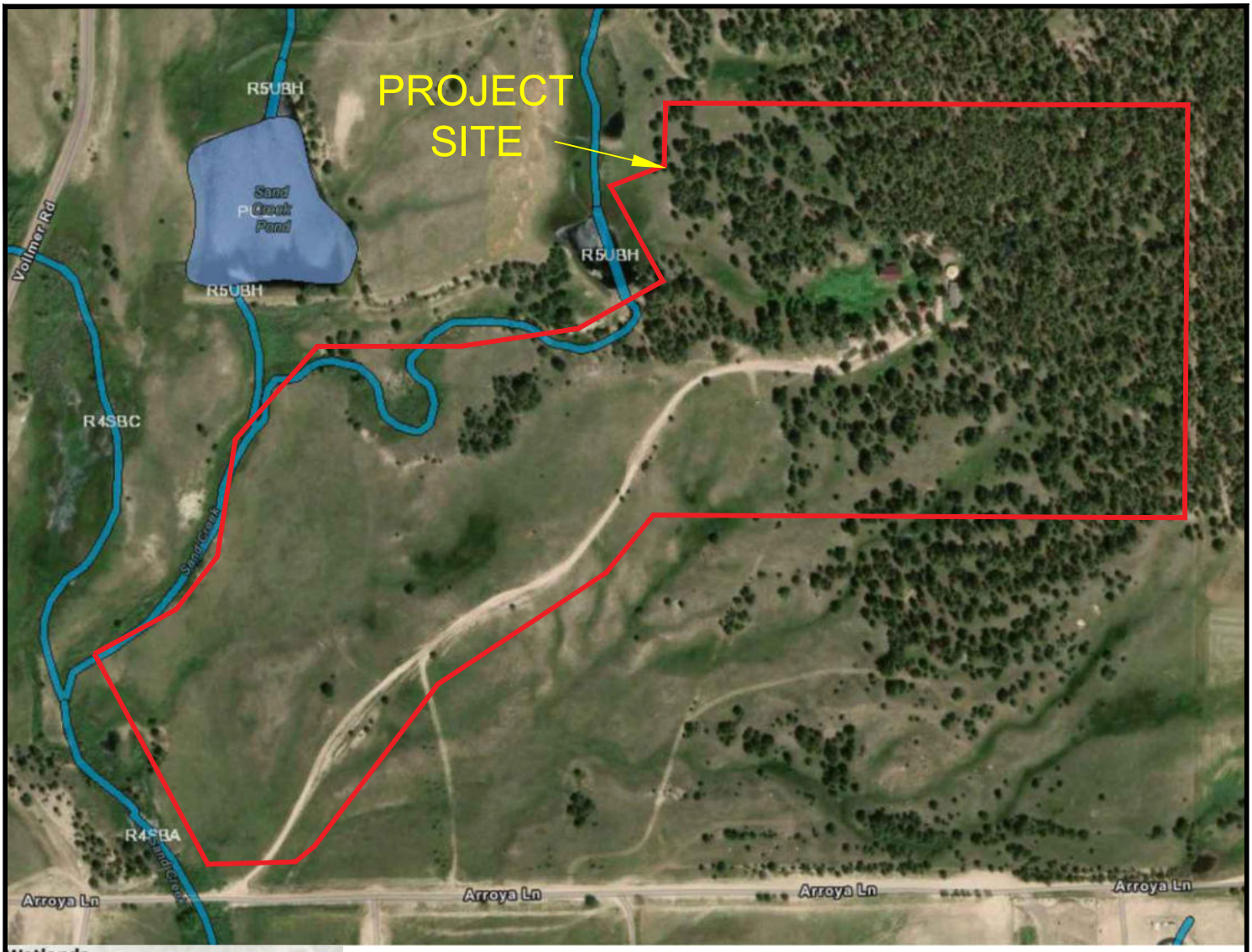
ENTECH ENGINEERING, INC.

FEMA FLOODPLAIN MAP

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 7



Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Riparian

- Forested/Shrub
- Herbaceous

N

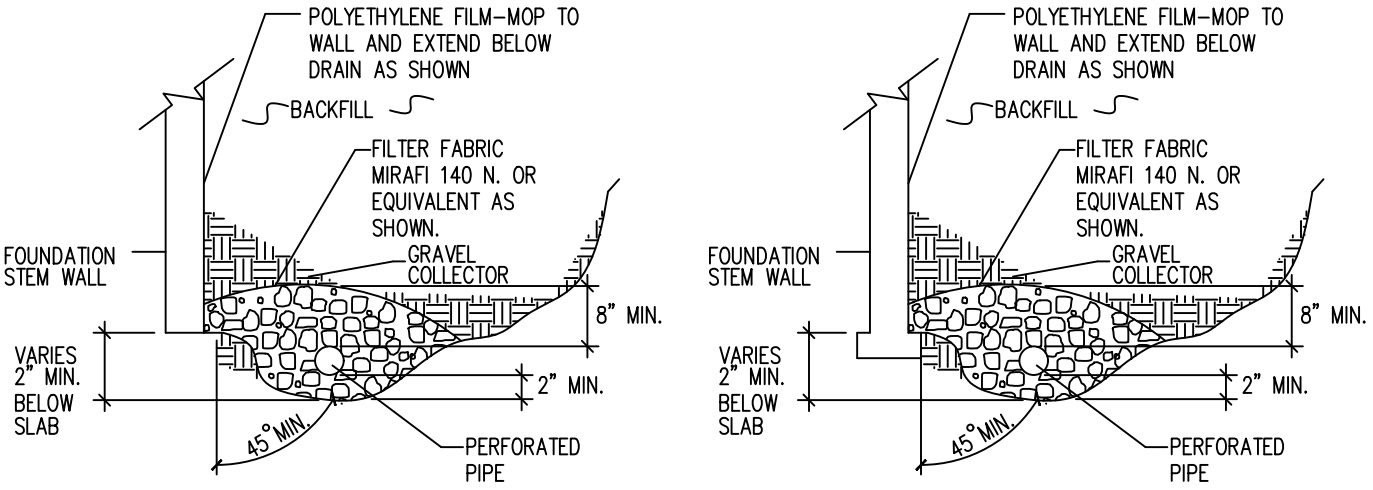
ENTECH ENGINEERING, INC.

FEMA FLOODPLAIN MAP

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 8



NOTES:

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

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

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

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

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

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

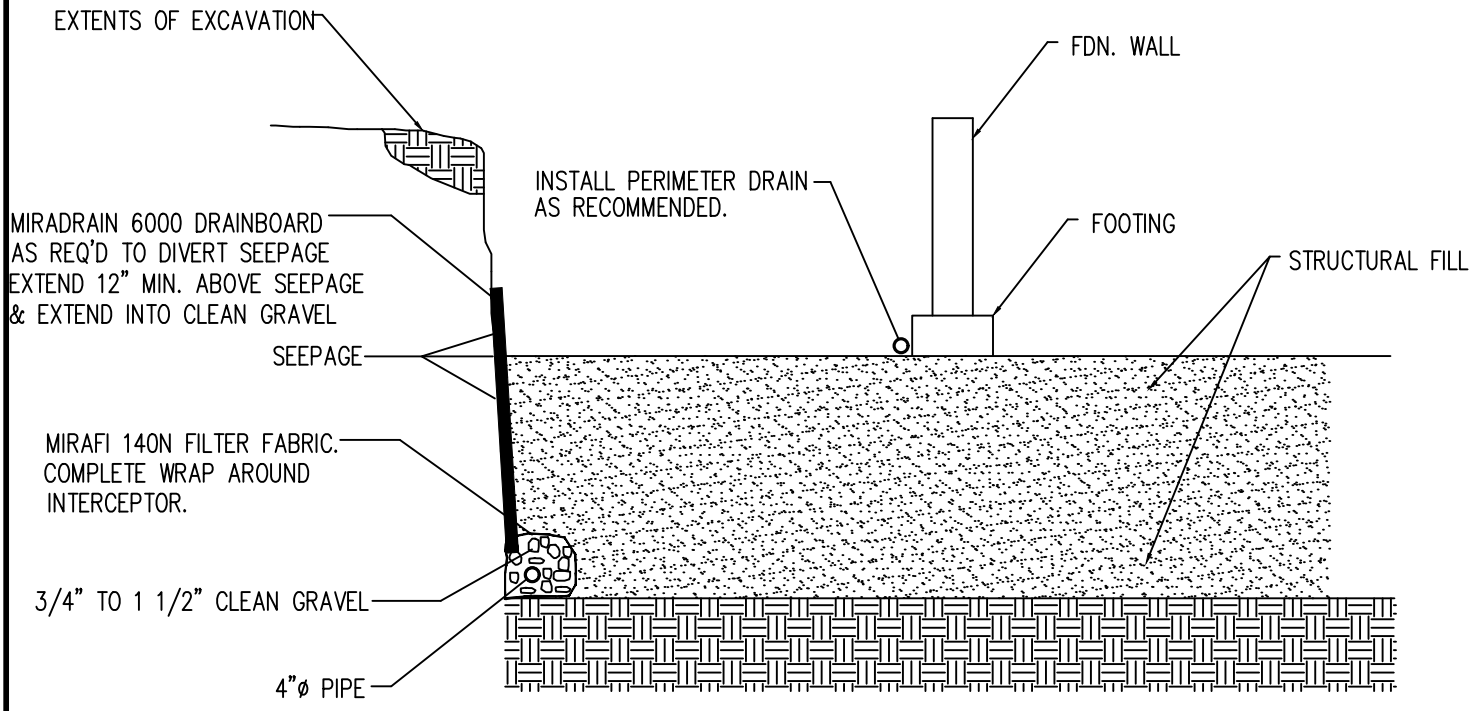
ENTECH ENGINEERING, INC.

PERIMETER DRAIN DETAIL

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 9



NOTE:
EXTEND INTERCEPTOR DRAIN TO UNDERDRAIN OR TO SUMP.
BENCH DRAIN INTO NATIVE SOILS 12 INCHES MINIMUM.

INTERCEPTOR DRAIN DETAIL

N.T.S.

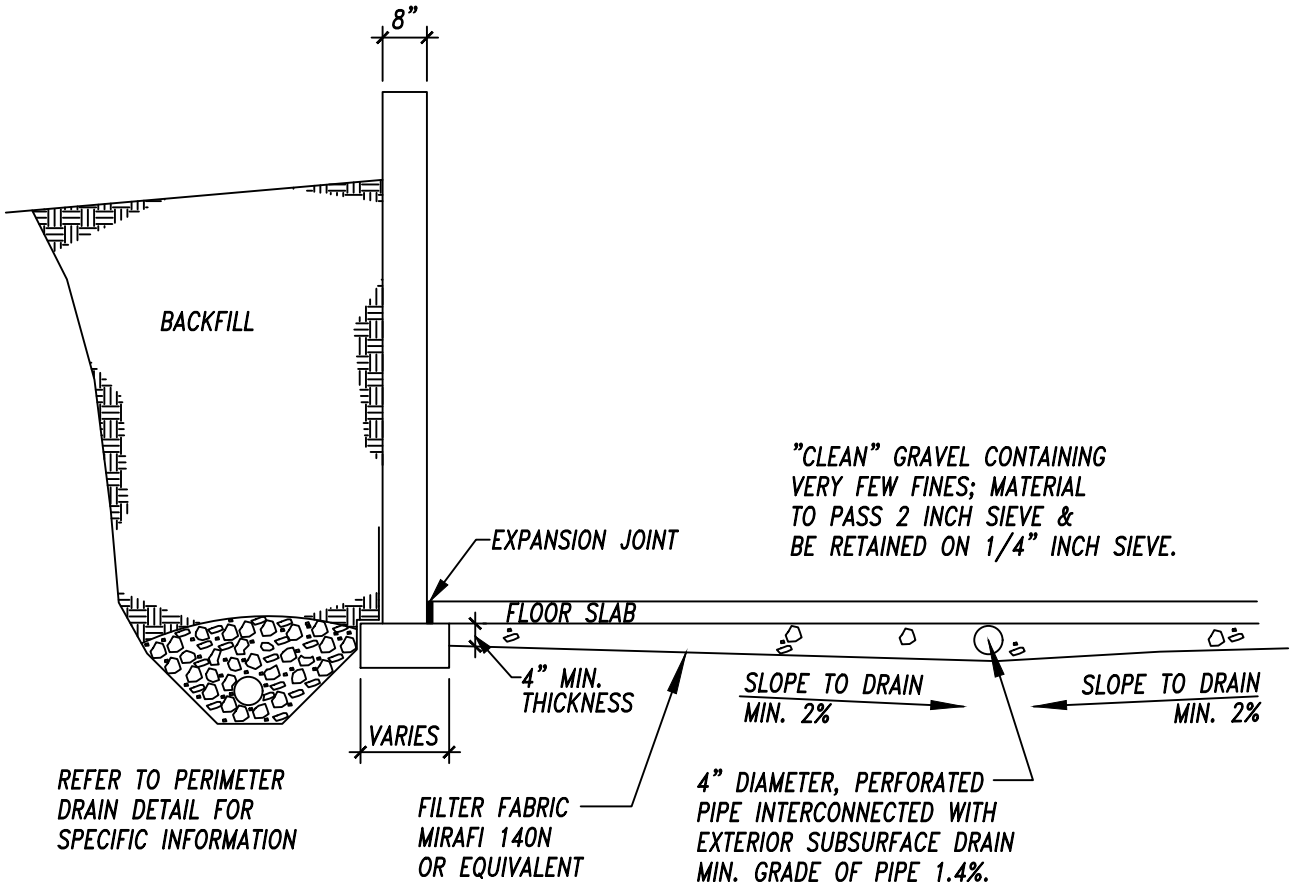
ENTECH ENGINEERING, INC.

INTERCEPTOR DRAIN DETAIL

9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 10



ENTECH ENGINEERING, INC.

TYP. UNDERSLAB DRAINAGE LAYER (CAPILLARY BREAK)
9220 ARROYA LANE
TIMBERS AT BLACK FOREST
SUBDIVISION 2025, LLC

JOB NO. 251875

FIG. 11

APPENDIX A: Site Photographs

1

Looking west from the southern side of the site.

October 22, 2025

2

Looking southwest from the eastern portion of the site.

October 22, 2025

Job No. 251875

3

Looking southwest along gravel driveway in area of erosion from southern portion of the site.

October 22, 2025

4

Looking west from the northern portion of the site.

October 22, 2025

Job No. 251875

5

Looking southwest along the potentially unstable slopes from the northern portion of the site.

October 22, 2025

6

Looking east towards existing barn and farm houses from the northern side of the site.

October 22, 2025

Job No. 251875

7

Looking south towards area of ponded water in stock pond along Lots 11 and 12.

October 22, 2025

8

Looking north from the eastern side of the site.

October 22, 2025

Job No. 251875

9

Looking south from the northern portion of the site.

October 22, 2025

10

Looking southwest from the southeastern portion of the site.

December 2, 2025

Job No. 251875

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING 1
DATE DRILLED 12/1/2025

REMARKS

WATER @ 16', 12/2/25

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, TAN, DENSE, MOIST		42	7.1	1
5	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)		50/10"	8.5	3
10			50/11"	7.8	3
15			50	10.9	3
20			50/10"	17.3	3

TEST BORING 2
DATE DRILLED 12/1/2025

REMARKS

WATER @ 10', 12/2/25

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, TAN, VERY LOOSE, MOIST		2	5.6	1
5			3	3.3	1
10			4	6.1	1
15	CLAY, SANDY, GRAY, MEDIUM, SOFT, MOIST		4	23.7	2
20	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, WITH SILT, VERY DENSE, MOIST)		50/10"	18.2	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. B-1

TEST BORING 3
DATE DRILLED 12/1/2025

REMARKS

DRY TO 20', 12/2/25

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, TAN, MEDIUM DENSE, MOIST		10	9.8	1
5			24	7.3	1
	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)		50/11"	7.0	3
10					
15			50/11"	7.2	3
20			50	10.5	3

TEST BORING 4
DATE DRILLED 12/1/2025

REMARKS

DRY TO 20', 12/2/25

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, TAN, MEDIUM DENSE, MOIST		20	5.2	1
5			15	6.4	1
	CLAY, SANDY, BROWN to GRAY, HARD, MOIST		38	13.4	2
10					
	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)		50/5"	6.6	3
15					
20			50/6"	7.7	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. B-2

TEST BORING 5
DATE DRILLED 12/1/2025

REMARKS

DRY TO 20', 12/2/25

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, TAN, LOOSE to MEDIUM DENSE, MOIST		9	7.2	1
5			6	3.1	1
10			23	9.7	1
	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)		50/10"	9.3	3
20			50/9"	9.4	3

TEST BORING 6
DATE DRILLED 12/1/2025

REMARKS

WATER @ 15', 12/2/25

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, CLAYEY, TAN, LOOSE, MOIST		7	17.1	1
5	SAND, SILTY, TAN, DENSE, MOIST		27	11.5	1
10	SANDSTONE, EXTREMELY WEAK, TAN, MODERATELY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)		50/9"	7.8	3
15	▼		50/9"	11.0	3
20			50/8"	7.8	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. B-3

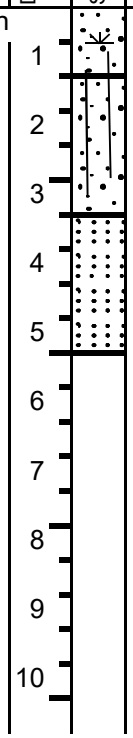
TABLE B-1

DEPTH TO BEDROCK & GROUNDWATER

TEST BORING	DEPTH TO BEDROCK (ft.)	DEPTH TO GROUNDWATER (ft.)
1	4	16
2	17	10
3	6	>20
4	11	>20
5	12	>20
6	7	15

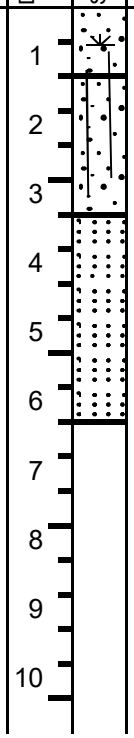
TEST PIT 1
DATE EXCAVATED 12/10/2025

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
topsoil, sandy loam, dark brown						
very gravelly sandy loam, fine to coarse grained, light brown,	1–3			gr	w	2A R1
completely weathered Dawson sandstone, light brown, dense (very gravelly sandy clay loam)	3–5			ma		3A R1



TEST PIT 2
DATE EXCAVATED 12/10/2025

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
topsoil, sandy loam, brown						
very gravelly sandy loam, fine to coarse grained, light brown, moist	1–3			gr	w	2A R1
completely weathered Dawson sandstone, light brown, dense (very gravelly sandy clay loam)	3–6			ma		3A R1



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

TIMBERS OF BLACK FOREST SUBDIVISION
IMBERS OF BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. B-4

TEST PIT 3
DATE EXCAVATED 12/10/2025

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
topsoil sandy clay loam, dark brown	1					
very gravelly sandy clay loam, fine to coarse grained, light brown, moist	2			gr	w	3A
	3					
	4					
sandy loam, fine to coarse grained, light brown, moist	5			gr	w	2A
	6					
completely weathered Dawson sandstone, light brown, dense (sandy clay loam)	7			ma		3A
	8					
*redoximorphic features at 6'	9					
	10					

TEST PIT 4
DATE EXCAVATED 12/10/2025

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
topsoil sandy clay, dark brown	1					
sandy clay, fine grained, brown, moist	2			gr	w	4A
	3					
sandy loam, fine to coarse grained, light brown, moist	4			gr	w	2A
completely weathered Dawson sandstone, light brown, dense (gravelly sandy clay loam)	5			ma		3A
	6					
	7					
	8					
*redoximorphic features at 4'	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

ENTECH ENGINEERING, INC.

TEST PIT LOGS

TIMBERS OF BLACK FOREST SUBDIVISION
IMBERS OF BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. B-5

TEST BORING 5
DATE DRILLED 12/10/2025
REMARKS

Description	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
topsoil, sandy loam, dark brown	1					
very gravelly sandy loam, fine to coarse grained, light brown, moist	2			gr	w	2A R1
	3					
	4					
sandy loam, fine to coarse grained, light brown, moist	5			gr	w	2A
	6					
	7					
	8					
	9					
	10					

<u>Soil Structure Shape</u>
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

<u>Soil Structure Grade</u>
weak - w
moderate - m
strong - s
loose - l

ENTECH ENGINEERING, INC.

TEST PIT LOGS

TIMBERS OF BLACK FOREST SUBDIVISION
IMBERS OF BLACK FOREST SUBDIVISION 2025, LL

JOB NO.
251875

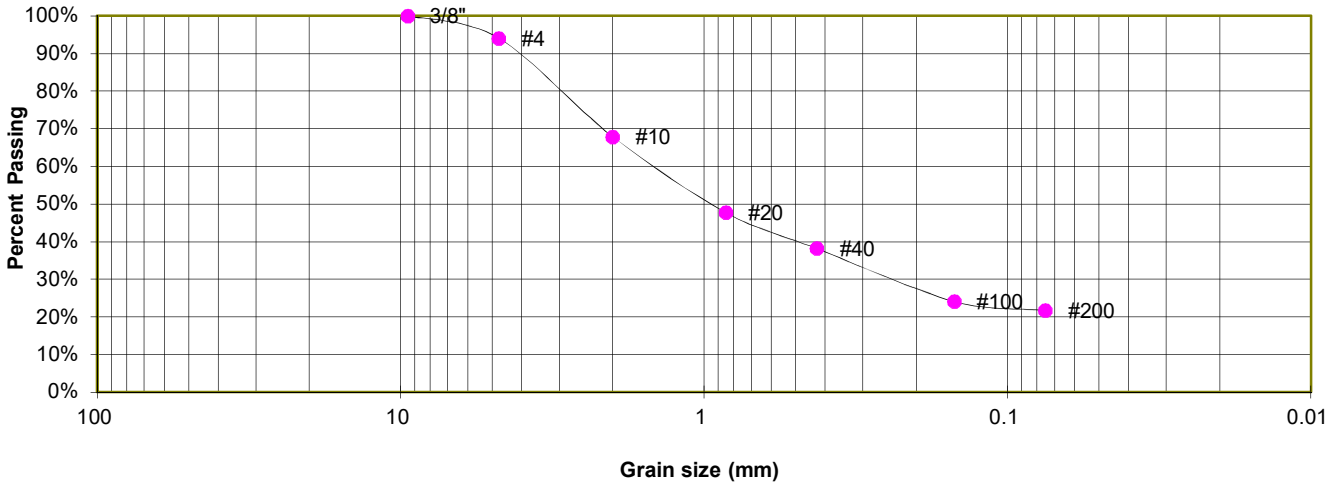
FIG. B-6

APPENDIX C: Laboratory Test Results

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	FHA SWELL (PSF)	USCS	SOIL DESCRIPTION
1	6	2-3	21.8	29	21	8	<0.01		SC	FILL, SAND, CLAYEY
1	1	2-3	12.5	NV	NP	NP	<0.01		SM	SAND, SILTY
1	5	5	12.4						SM	SAND, SILTY
2	4	10	68.2				<0.01	330	CL	CLAY, SANDY
3	2	15	6.1						SW-SM	SANDSTONE (SAND, WITH SILT)
3	3	10	12.2	31	23	8	<0.01		SM	SANDSTONE (SAND, SILTY)

TEST BORING	6	SOIL DESCRIPTION	FILL, SAND, CLAYEY
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.1%
10	67.9%
20	47.8%
40	38.2%
100	24.2%
200	21.8%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	29
Plastic Index	8

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

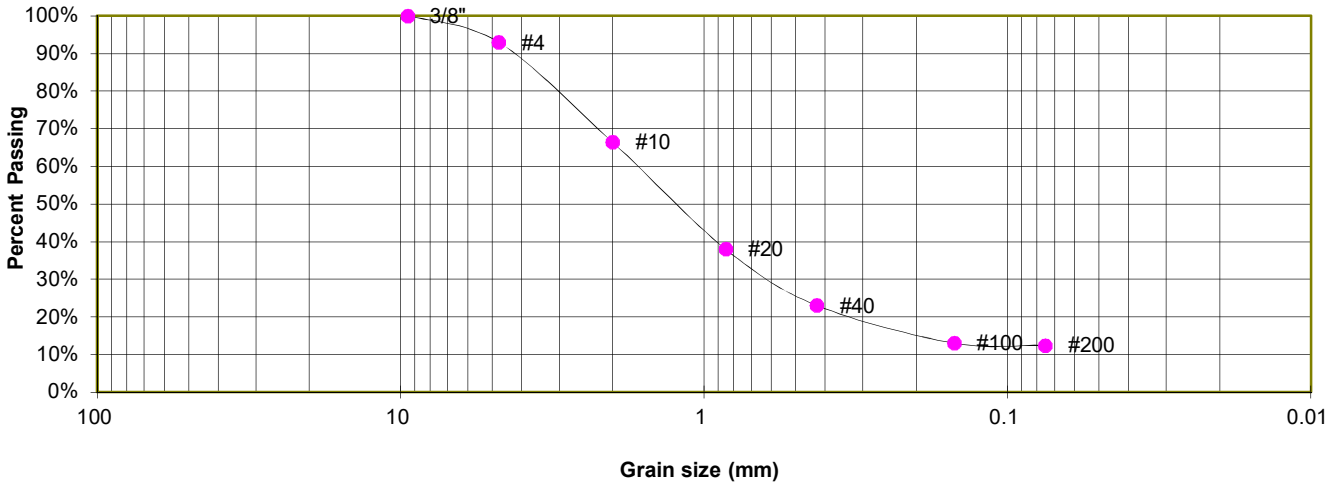
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-1

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.0%
10	66.4%
20	38.1%
40	23.1%
100	13.0%
200	12.5%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

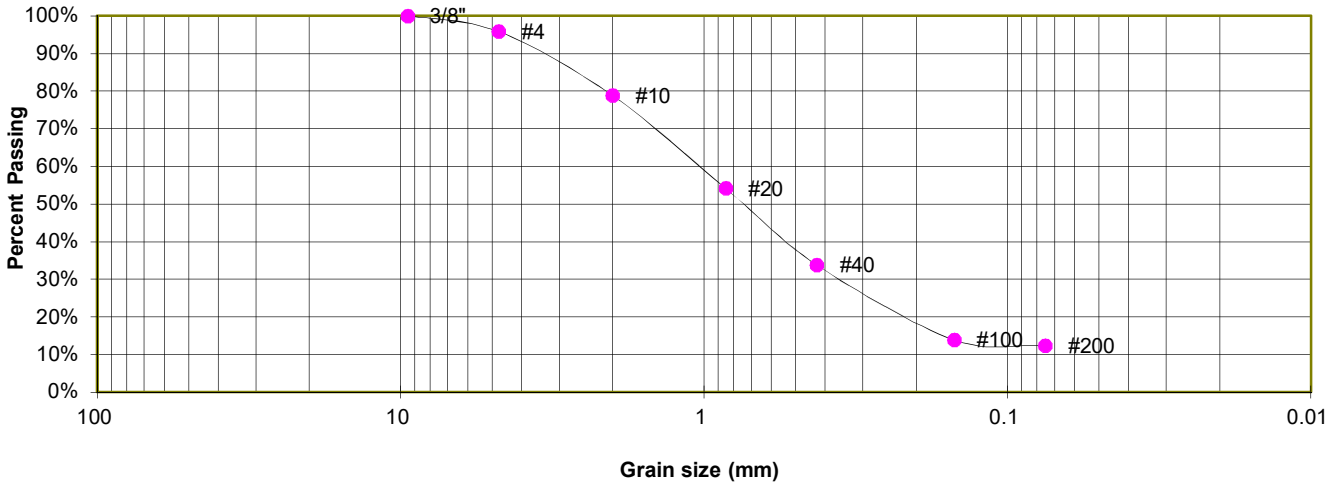
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-2

TEST BORING	5	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.8%
10	78.8%
20	54.2%
40	33.8%
100	13.9%
200	12.4%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

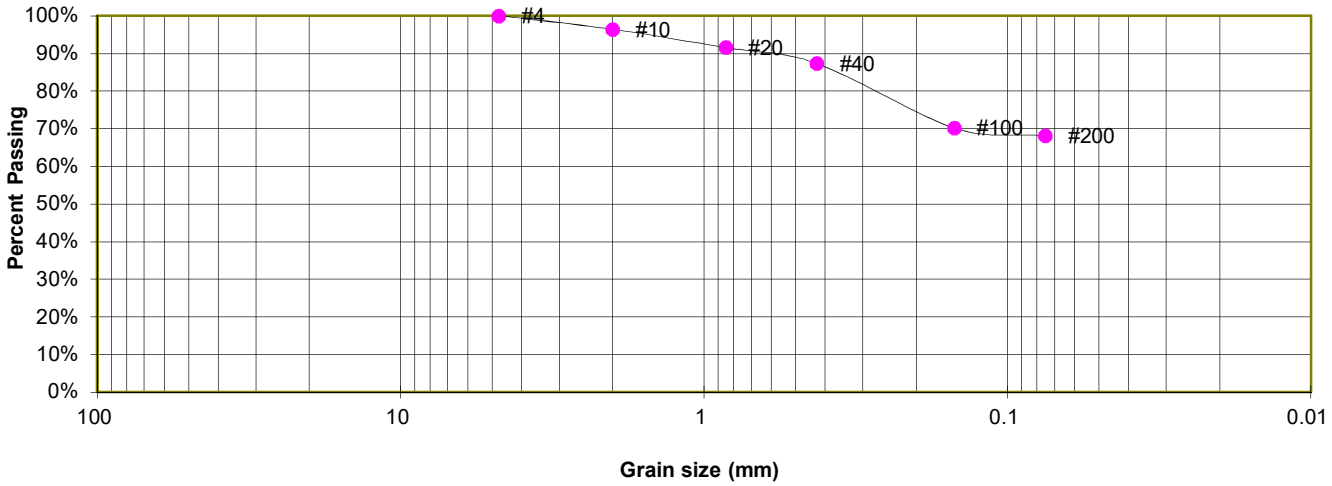
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-3

TEST BORING	4	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	10	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	96.4%
20	91.6%
40	87.4%
100	70.2%
200	68.2%

FHA SWELL

Moisture at start	19.2%
Moisture at finish	25.8%
Moisture increase	6.6%
Initial dry density (pcf)	93
Swell (psf)	330

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

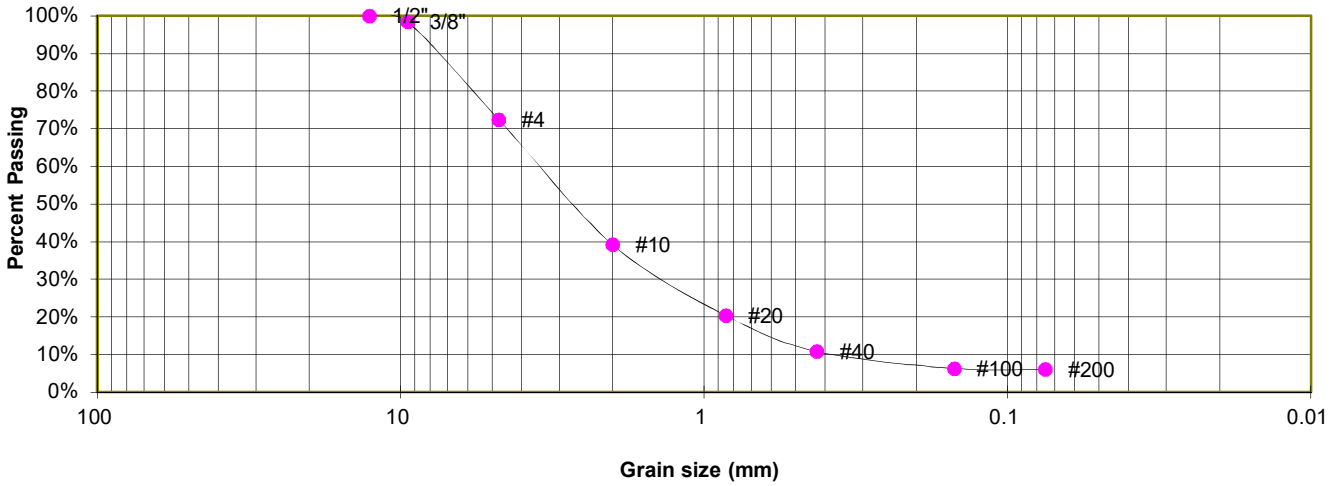
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-4

TEST BORING	2	SOIL DESCRIPTION	SANDSTONE (SAND, WITH SILT)
DEPTH (FT)	15	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.4%
4	72.5%
10	39.2%
20	20.4%
40	10.8%
100	6.3%
200	6.1%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

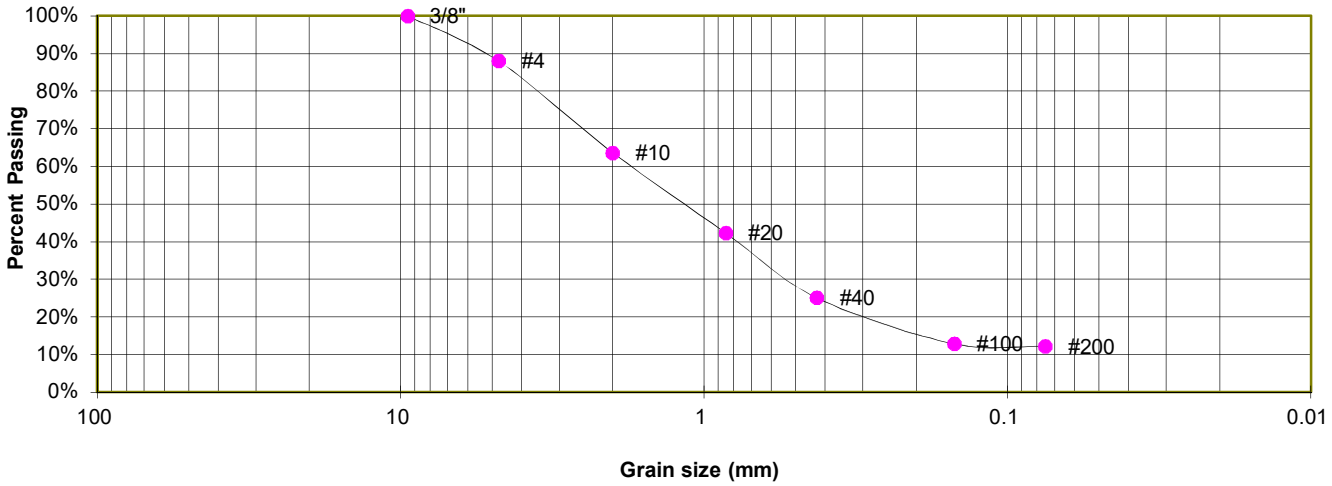
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-5

TEST BORING	3	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	10	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	88.0%
10	63.6%
20	42.4%
40	25.1%
100	12.9%
200	12.2%

ATTERBERG LIMITS

Plastic Limit	23
Liquid Limit	31
Plastic Index	8

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

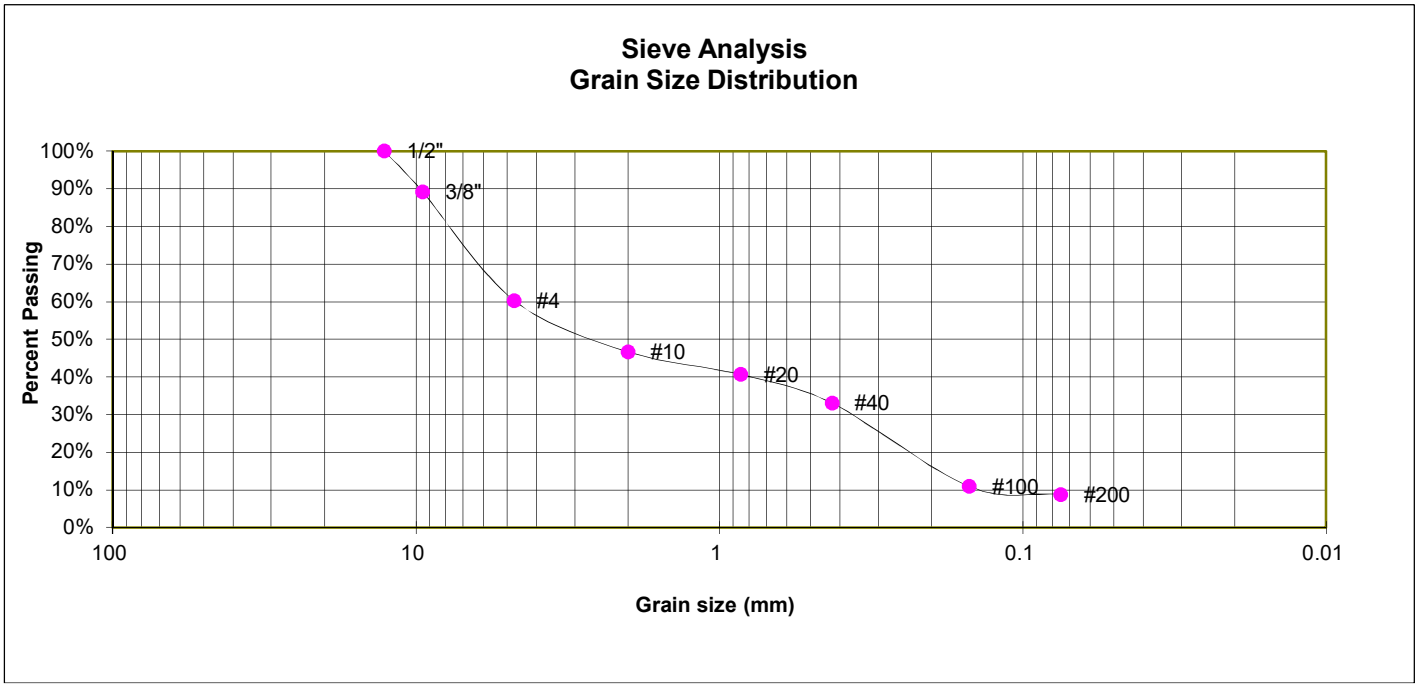
FIG. C-6

ENTECH ENGINEERING, INC.

TABLE C-2
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	PASSING NO. 200 SIEVE (%)	RETAINED NO. 10 SIEVE (%)	USCS	SOIL DESCRIPTION
1	TP-1	2-3	8.8	53.3	SP-SM	SAND, GRAVELLY, WITH SILT
1	TP-1	4-5	10.3	51.8	SW-SM	SAND, GRAVELLY, WITH SILT
1	TP-2	2-3	9.2	48.7	SW-SM	SAND, GRAVELLY, WITH SILT
1	TP-2	5-6	10.0	45.6	SW-SM	SAND, GRAVELLY, WITH SILT
1	TP-3	2-3	7.2	43.5	SP-SM	SAND, GRAVELLY, WITH SILT
1	TP-3	6-7	39.3	17.1	SC	SAND, CLAYEY
2	TP-4	2-3	58.2	2.2	CL	CLAY, SANDY
1	TP-4	4-5	11.2	16.4	SW-SM	SAND, WITH SILT
1	TP-5	3-4	3.1	38.2	SW	SAND, SLIGHTLY SILTY
1	TP-5	7-8	35.3	19.9	SC	SAND, CLAYEY

TEST BORING	TP-1	SOIL DESCRIPTION	SAND, GRAVELLY, WITH SILT
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	89.2%
4	60.3%
10	46.7%
20	40.7%
40	33.0%
100	10.9%
200	8.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SP-SM

ENTECH ENGINEERING, INC.

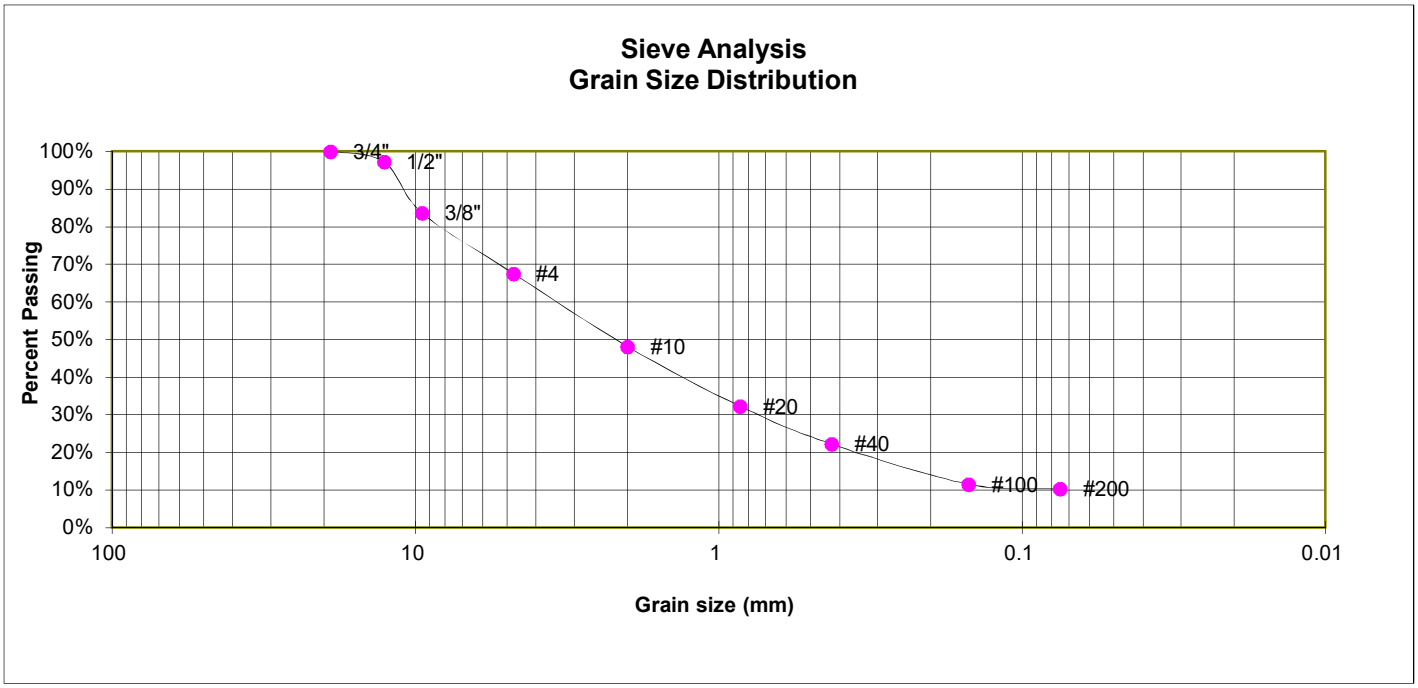
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-6

TEST BORING	TP-1	SOIL DESCRIPTION	SAND, GRAVELLY, WITH SILT
DEPTH (FT)	4-5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	100.0%
1/2"	97.3%
3/8"	83.6%
4	67.5%
10	48.2%
20	32.2%
40	22.2%
100	11.6%
200	10.3%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

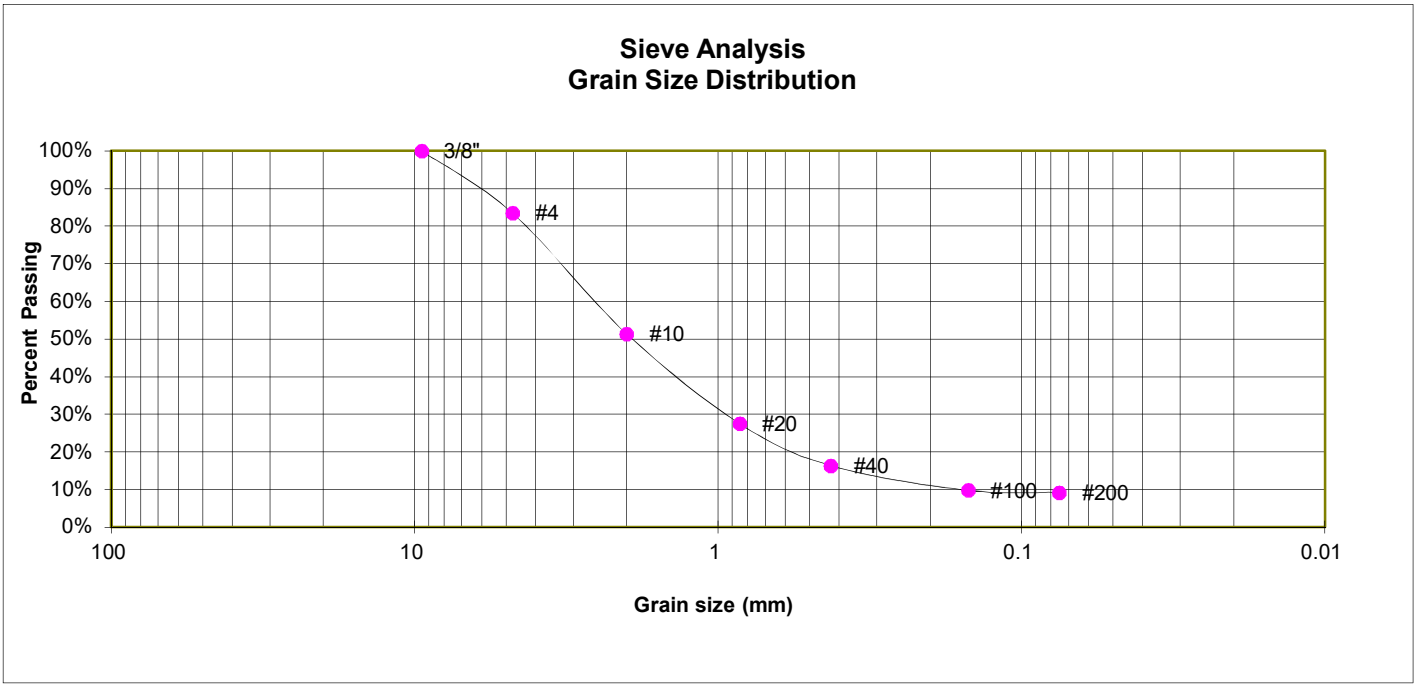
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-8

TEST BORING	TP-2	SOIL DESCRIPTION	SAND, GRAVELLY, WITH SILT
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	83.4%
10	51.3%
20	27.6%
40	16.4%
100	9.8%
200	9.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

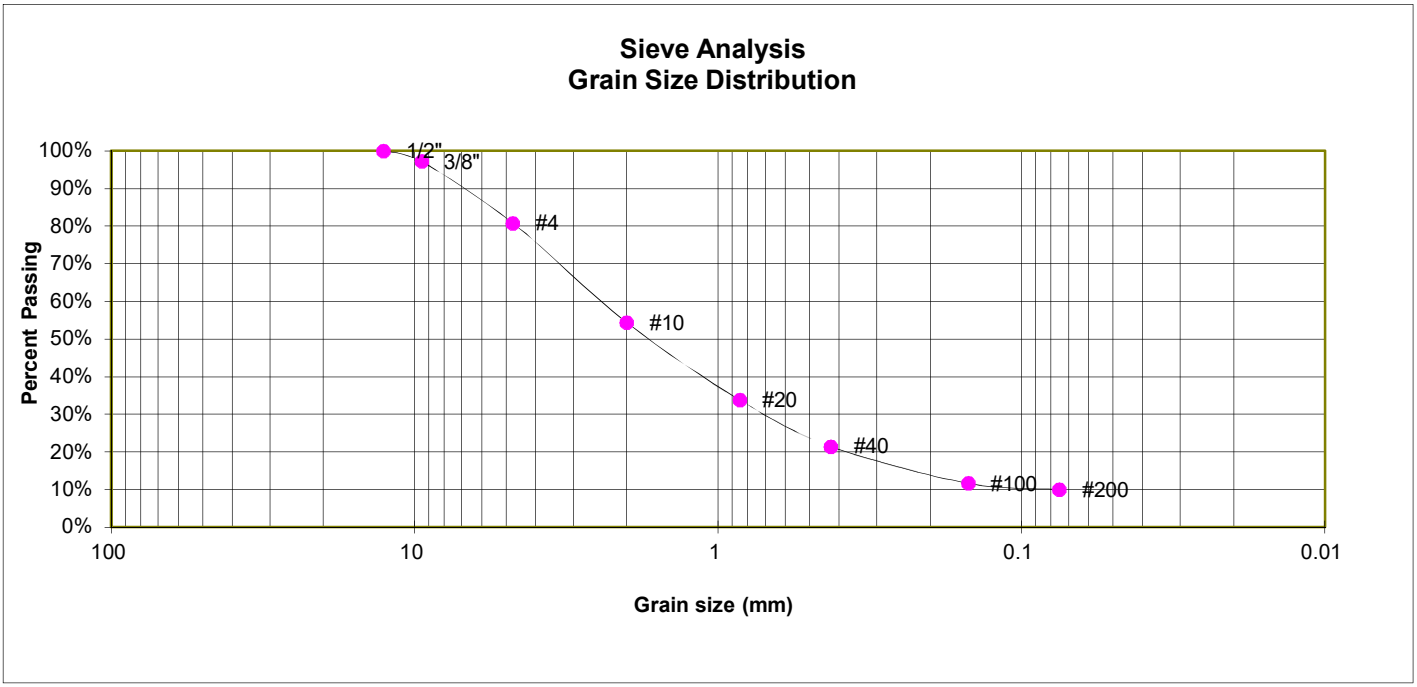
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-9

TEST BORING	TP-2	SOIL DESCRIPTION	SAND, GRAVELLY, WITH SILT
DEPTH (FT)	5-6	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.2%
4	80.8%
10	54.4%
20	33.9%
40	21.5%
100	11.7%
200	10.0%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

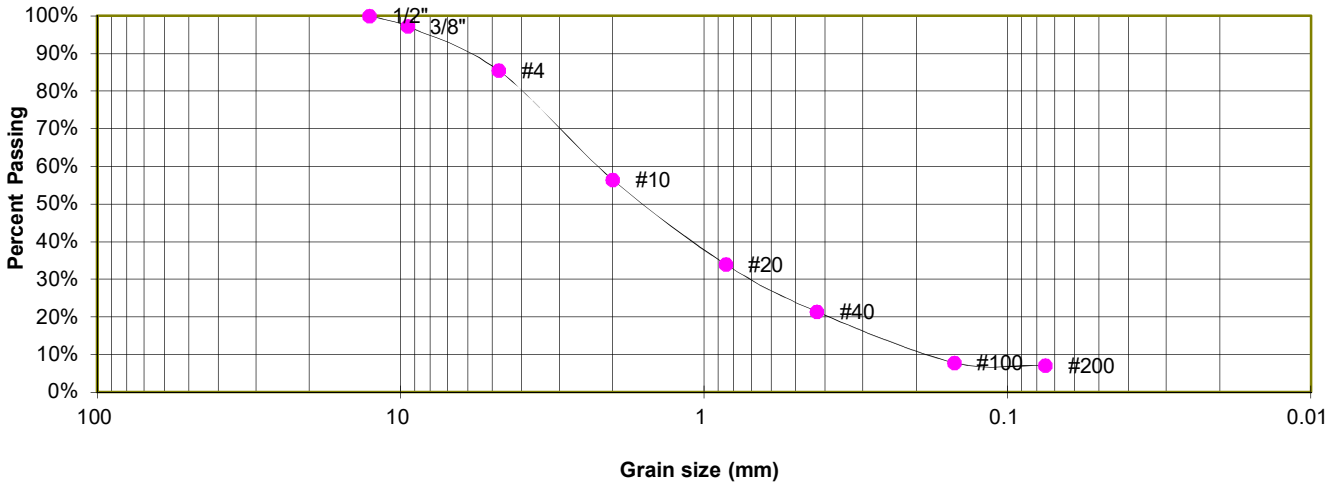
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-10

TEST BORING	TP-3	SOIL DESCRIPTION	SAND, GRAVELLY, WITH SILT
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.2%
4	85.5%
10	56.5%
20	34.0%
40	21.4%
100	7.9%
200	7.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SP-SM

ENTECH ENGINEERING, INC.

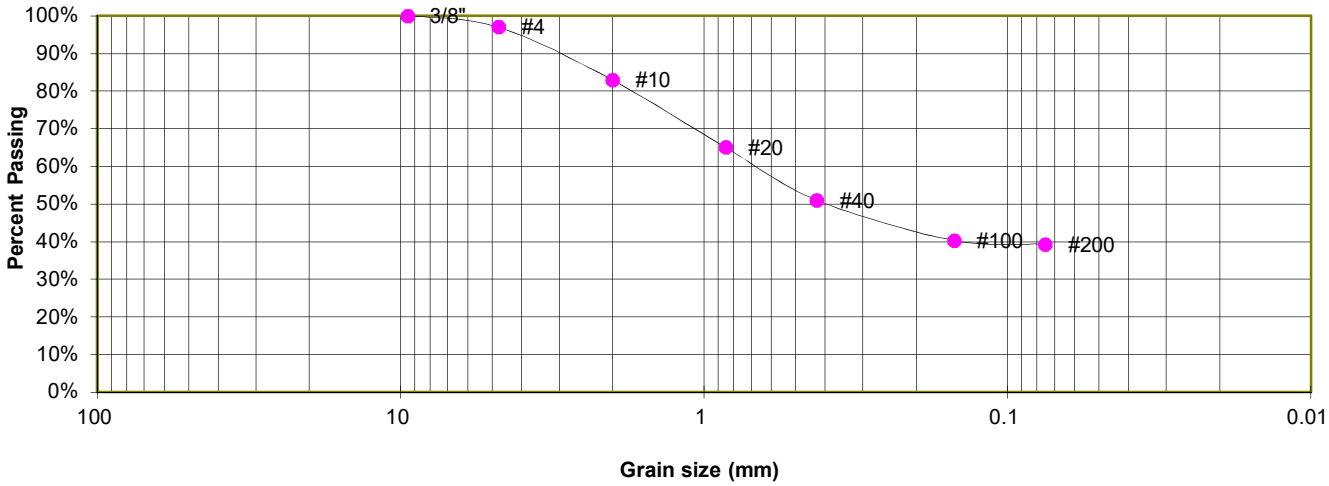
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-11

TEST BORING	TP-3	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	6-7	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.0%
10	82.9%
20	65.0%
40	51.0%
100	40.3%
200	39.3%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

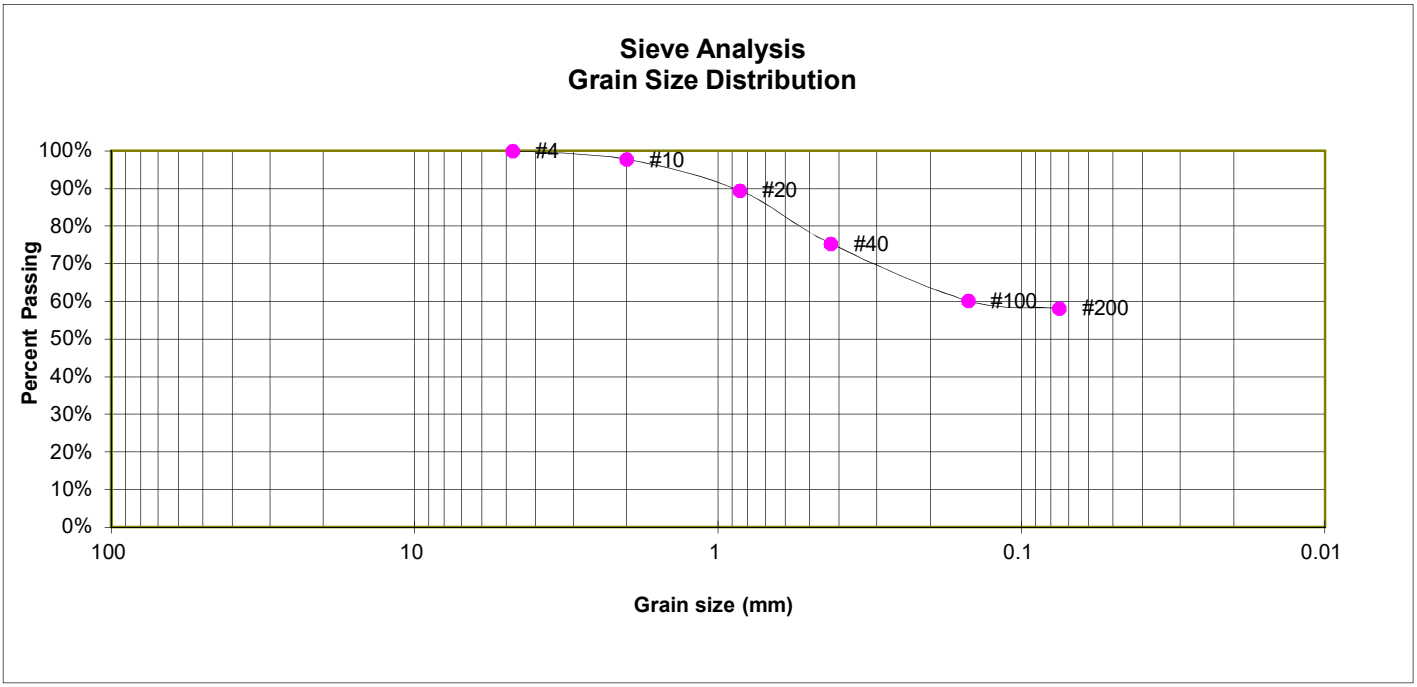
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-12

TEST BORING	TP-4	SOIL DESCRIPTION	CLAY, SANDY
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	97.8%
20	89.5%
40	75.3%
100	60.2%
200	58.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

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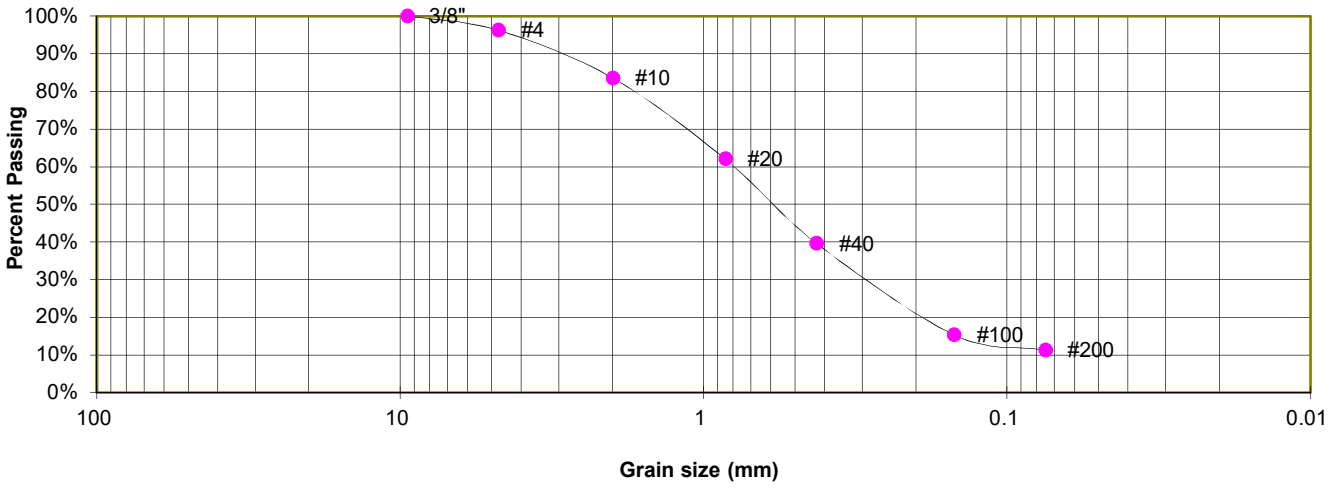
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-13

TEST BORING	TP-4	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	4-5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.3%
10	83.6%
20	62.1%
40	39.6%
100	15.4%
200	11.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

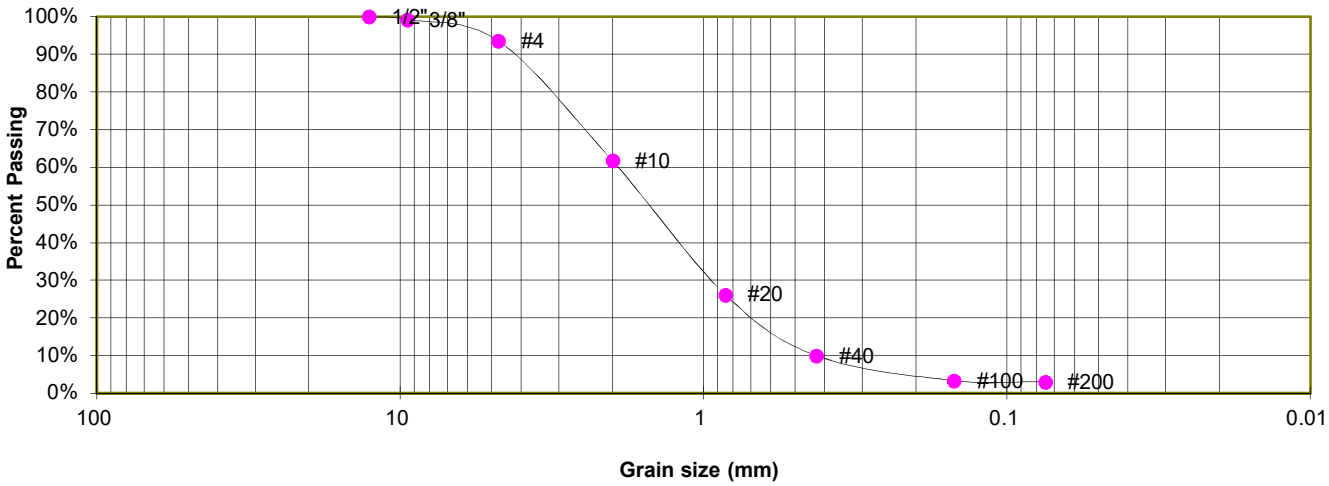
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-14

TEST BORING	TP-5	SOIL DESCRIPTION	SAND, SLIGHTLY SILTY
DEPTH (FT)	3-4	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	99.2%
4	93.6%
10	61.8%
20	26.2%
40	10.0%
100	3.4%
200	3.1%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW

ENTECH ENGINEERING, INC.

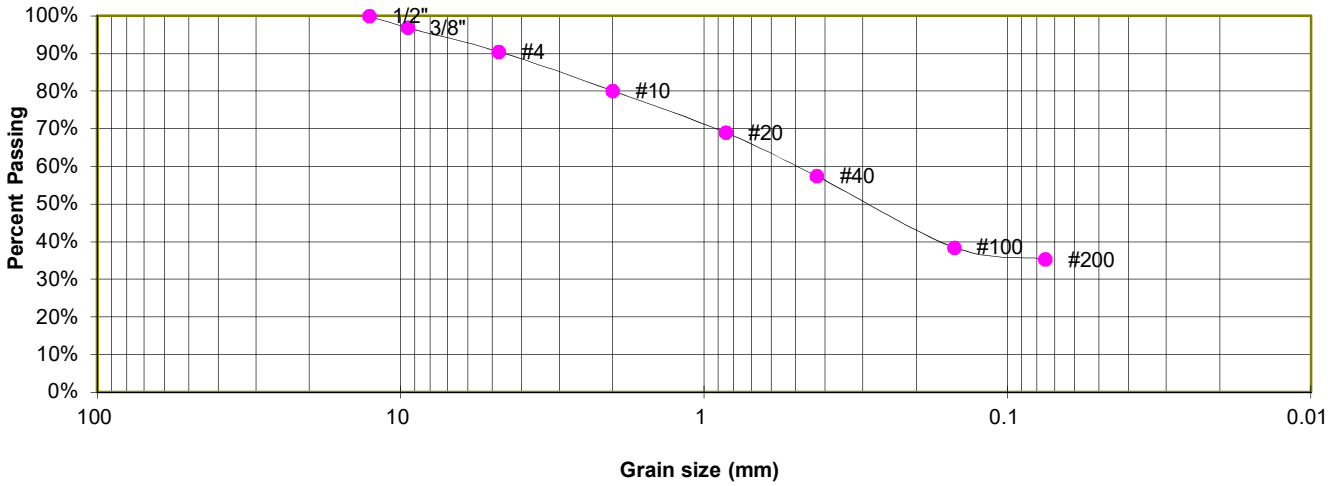
LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-15

TEST BORING	TP-5	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	7-8	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	96.9%
4	90.5%
10	80.1%
20	69.0%
40	57.4%
100	38.5%
200	35.3%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

9220 ARROYA LANE
IMBERS AT BLACK FOREST SUBDIVISION 2025, LL

JOB NO. 251875

FIG. C-16

APPENDIX D: USDA 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: 15 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

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 23, Aug 29, 2025

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: 15 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

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

Pleasant
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 23, Aug 29, 2025

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
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Minor components: 15 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 supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

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

Minor Components

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 23, Aug 29, 2025