



**ENTECH**  
ENGINEERING, INC.

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

**SOIL, GEOLOGY, AND GEOLOGIC HAZARD STUDY  
STERLING RANCH FILING NO. 4  
PARCEL 10  
EL PASO COUNTY, COLORADO**

Prepared for

**Classic SRJ**  
2138 Flying Horse Club Drive  
Colorado Springs, Colorado 80921

Attn: Loren Moreland

May 25, 2022


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. 220921  
F:/AAPProjects/2022/220921 Geohaz

## 1.0 SUMMARY

### ***Project Location:***

The project lies in portions of the SW ¼ Section 33, Township 12 South, and NW ¼ Section 4, Township 13 South, Range 65 West of the 6<sup>th</sup> Principal Meridian. The site is located east of Vollmer Road and north of Woodmen Road, along proposed Sterling Ranch Road, south of Dines Road in El Paso County, Colorado.

### ***Project Description:***

Total acreage involved in the project is approximately 32 acres. The proposed development is to consist of one-hundred and forty-eight single-family residential lots with associated site improvements. The development will be serviced by Sterling Ranch Metropolitan District.

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### ***Scope of Report:***

The report presents the results of our geologic investigation and treatment of engineering geologic hazard study. This report presents the results of our geologic reconnaissance, a review of available maps, aerial photographs and our conclusions with respect to the impacts of the geologic conditions on development.

### ***Land Use and Engineering Geology:***

The site was found to be suitable for development. Geologic conditions will impose some constraints on development. These include areas of artificial fill, potentially expansive soils, hydrocompaction, and areas of seasonal and potentially seasonal shallow groundwater. Artificial fill is associated with recent grading and fill stockpiles. Hydrocompaction is associated with wind-blown sand deposits. Areas of seasonal and potentially seasonal shallow groundwater occur in a drainage in the western portion of the site and in southern areas of the site. Shallow bedrock will also be encountered on portions of the site. Site conditions will be discussed in greater detail in this report. All recommendations are subject to the limitations discussed in the report.

## 2.0 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The project lies in portions of SW ¼ Section 33, Township 12 South, and NW ¼ Section 4, Township 13 South, Range 65 West of the 6<sup>th</sup> Principal Meridian. The site is located east of Vollmer Road and north of Woodmen Road, along proposed Sterling Ranch Road, south of Dines Road in El Paso County, Colorado. The location of the site is shown on the Vicinity Map, Figure 1.

The topography of the site is generally gently sloping to the south with moderate slopes along the drainage in the western portion of the site, which flows in a southerly direction. An existing detention pond exists in the southern portion of the site. The area of the site is indicated on the USGS Map, Figure 2. Previous site uses have included aggregate extraction as a part of the Pioneer Sand Quarry. Existing sand and gravel quarries lie to the southeast of the site. The vegetation on site consists of low field grasses, weeds with areas where vegetation has been removed.

Total acreage involved in the proposed development is approximately 32 acres. The proposed development is to consist of one-hundred and forty-eight single-family residential lots with associated site improvements. The development is to be serviced by Sterling Ranch Metropolitan District. The overall site plan for the entire Sterling Ranch Development, including the subject site, is presented in Figure 3. The development plan for Sterling Ranch Filing No. 4 is presented in Figure 4. Site photographs, taken on April 20, 2022, are included in Appendix A. The approximate locations and directions of the photographs are indicated on Figure 4. The proposed grading is indicated on Figure 4.

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Debris Fans – Hazard

Based on-site observations, debris fans were not observed in this area.

Groundwater and Floodplain Areas – Constraint

Areas within the drainage swale along the western and northern portions of the site have been identified as seasonal and potentially seasonal shallow groundwater areas. According to the development plan, Figure 7, surface waters in this drainage are to be collected and piped along the western boundary to a detention pond south of the site. The Sand Creek drainage lies east of the site and has been mapped as a floodplain zone according to the FEMA Map No. 08041CO533G, Figure 8 (Reference 13). The site does not lie within the floodplain zone as indicated in Figure 8. Finished floor levels must be a minimum of one **foot** above the floodplain level. Exact floodplain locations by drainage studies are beyond the scope of this report. Much of the western portions of the site have been mapped as seasonal and potentially seasonal shallow groundwater due to the drainage swale, although, shallow groundwater could be encountered adjacent to these areas during periods of high moisture. These areas are discussed as follows:

foot

Seasonal Shallow Groundwater: In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and possible frost heave potential, depending on the soil conditions. These areas are located within the drainage swale along the western portions of the site. According to the grading plan, these areas are to be regraded and surface drainage will be collected and piped along the western boundary of the site to a detention pond south of the site. Areas of shallow groundwater may exhibit unstable subgrade conditions in terms of bearing support of construction equipment during overlot grading. Lots immediately adjacent to drainage may also experience higher subsurface moisture conditions during periods of higher flows.

Mitigation: In these locations, foundations subject to severe frost heave potential should penetrate sufficient depth so as to discourage the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth for frost protection of 30 inches is recommended. Foundations should be kept as high as possible. Areas may experience higher groundwater levels during period of higher precipitation where water can flow through permeable sands on top of less permeable bedrock materials. Subsurface perimeter drains