

EP-19-0140_5 Saddlehorn Filing 3

El Paso County File Number SF234

Includes: Filing 3 includes 44 single family residences on 175.4285 acres.

Location: 38.9475, -104.5435

S3 T13S R64W 6th P.M.

Comments uploaded to El Paso County Development Application Review on 3/16/2023:

Pertinent documents provided with this referral include Soil, Geology, & Geologic Hazard Study (Entech Engineering, Inc., November 15, 2022), Letter of Intent (William Guman & Associates, Ltd., March 15, 2022), Final Plat (J.R. Engineering, February 4, 2022), Wastewater Study (Entech Engineering, Inc., November 15, 2022), and other documents.

CGS agrees with most of Entech's geologic interpretations, identification of hazards and constraints associated with the geologic conditions, and the proposed mitigation measures. The geologic conditions identified by Entech, with the exception of shallow groundwater, can be determined during a site-specific soil and foundation investigation. During the preliminary plan submittal, CGS recommended and commented on the need for a groundwater monitoring program or drain systems if below grade levels are planned (letter dated December 14, 2020). We offer the following comments and recommendations based on the updated documents.

Shallow and potentially shallow groundwater has been identified at the site. However, data has yet to be collected for the extent of groundwater fluctuations that can be expected here. Groundwater was encountered in eight test borings and three test pits within Filing No. 3 at depths ranging from 6 to 14.5 feet during drilling operations in October of 2022. Without a seasonal groundwater monitoring program, potential impacts from shallow groundwater remain indeterminate in sites with persistent but intermittent shallow groundwater such as this one. Seasonal fluctuations of shallow groundwater cannot be determined from these singular data points but require measurements during spring, summer, fall, and winter.

Therefore, if below grade levels are desired for lots within Filing 3, **CGS recommends the county require groundwater monitoring/observation to verify that proposed floor levels are at least three feet (preferably 5 feet) above maximum anticipated groundwater levels and maintained year-round.** This monitoring/observation program should be conducted to determine if basements are feasible, to design detention ponds, and to determine if an underdrain system for the development is required due to shallow groundwater conditions. If site grades cannot be raised to maintain the minimum separation distance and/or an underdrain system is determined not to be feasible, then full-depth basements should not be allowed, and a statement indicating "No Basements" be shown on the final plat.

Entech has recommended drain systems for areas with seasonal groundwater issues. The other identified shallow groundwater condition identified at the site relates to perched groundwater. They state (p.10), "Perched water conditions could be encountered across the entire site where water can flow within permeable sand layers overlying impermeable bedrock. These areas should be identified on an individual basis at the time of construction. Where perched water conditions are encountered, the mitigation recommendations for seasonal and potentially seasonal shallow groundwater should be

followed.” **As perched water conditions can be encountered anywhere within the site, CGS recommends that the drain systems (perimeter, underslab, interceptor, etc.) presented by Entech on p. 10 of their November 15, 2022 report should be required for all lots within Filing 3 unless it can be proven with a groundwater monitoring program that below grade areas (basements or storage areas) will be maintained 3 to 5 feet above the highest expected groundwater elevations and/or perched groundwater locations.** These drain systems should be connected to an underdrain system constructed for the development. Please note that individual foundation perimeter drains are needed around any below-grade (basement) space and are intended to handle only small amounts of intermittent water and should not be used to mitigate a persistent shallow groundwater condition.

In summary, as a condition for approval of the final plat for Filing 3, a groundwater observation/monitoring program should be performed if below-grade levels are planned, or drain systems should be required for all lots within Filing 3. Entech’s recommendations for OWTS in their wastewater study should be adhered to during design and installation.

Submitted 3.16.23 by Amy Crandall, Engineering Geologist, Colorado Geological Survey
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