

EP-24-0022\_1 Overlook at Homestead Preliminary Plan

File Number: SP238

Location: Section 27, T11S, R64W, 6th P.M.

39.0681, -104.5456

The available referral documents include a Soil and Geology Study (Entech Engineering Inc., August 2, 2023), Preliminary Plan (N.E.S., Inc., October 6, 2023), Letter of Intent (N.E.S., Inc., October 2023), Preliminary Drainage Report (Kimley Horn and Associates, August 7, 2023), Wastewater Disposal Report (RESPEC, September 2023), and other documents. The site consists of 62 single-family lots within 346.55 acres. Geologic hazards and constraints are associated with this site. We offer the following comments and recommendations.

Entech's report contains a good description of the site's geology, surface and subsurface conditions, and potential development constraints. CGS agrees that the site is suitable for the proposed development, provided Entech's recommendations regarding mitigation of artificial fill, expansive soils, shallow groundwater, potentially unstable slopes, rockfall, and debris flows are strictly adhered to. Even so, to avoid these hazards, some lots will include a limited area for building envelopes and septic systems. It would be prudent for the county to recommend that proposed building envelopes be included in the plat/plans. Additionally, mitigation measures should be included in the preliminary plans. CGS offers the following comments and recommendations.

**Rockfall and potentially unstable slopes.** Entech identified potentially unstable slopes along the mesa with rockfall hazards associated with the rock outcrops (lots 23-35). Entech recommends (p. 9) "A minimum setback of 30 feet from the crest of the cliff/steep slopes." CGS agrees with Entech that due to the size of the lots (~3 to 5 acres), these areas can likely be avoided or mitigated. **CGS recommends the setback from potentially unstable slopes and "no build easements" associated with rockfall hazards be clearly noted on the plat.**

**Debris fans/debris flow susceptibility.** Based on debris flow susceptibility mapping, drainages originating from the steep mesa are areas of debris flow hazards. Although the site is not within a defined floodplain, the drainages with the site may be affected by erosion, flooding, sediment-laden flows, and erosion following heavy precipitation. CGS agrees with Entech (p. 9) that "Drainage culverts and other drainage infrastructure should be adequately sized for the potential sediment laden flows." Erosional setbacks from any drainage/channel within the site should be established along with site grading that provides positive surface drainage and BMPs for stormwater. **CGS recommends the final drainage study analyze bulked flow dynamics associated with hyperconcentrated flooding emanating from the drainages for 25- and 100-year storm events.**

**Expansive soils and bedrock.** The site is underlain by alluvium and colluvium (silty sands and clays) and soils derived from in situ weathering of the underlying Dawson Formation bedrock. The Dawson consists of sandstones interbedded with lenses of siltstone and claystone. The claystones and clayey soils are typically expansive. Entech provides appropriate mitigation strategies (overexcavation and replacement with non-expansive fill placed using specified water content and compaction criteria, p. 7) for use if expansive soils or bedrock are encountered beneath proposed foundations. Site-specific, design-level geotechnical investigations, including drilling, sampling, lab testing, and analysis, will be needed once building locations are finalized to

characterize soil and bedrock engineering properties such as density, strength, swell and consolidation potential, and bearing capacity at and below approximate foundation bearing depths, and to determine groundwater levels. This information is needed to determine maximum bearing and minimum dead load pressures (if applicable), and to develop final design criteria for foundations, floor systems, pavements, and subsurface drainage.

**Groundwater, perched water, and foundation drainage recommendations.** The project is in a geologic setting and location known for shallow fluctuating groundwater. Groundwater was encountered in the borings at depths of 3 to 18 feet during drilling. CGS agrees with Entech (p. 6), “Fluctuations in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time.” Shallow groundwater conditions are expected to fluctuate with differing precipitation events and seasons. No basements should be planned in areas where groundwater is within 3 feet of foundation components. If significant grading or below-grade levels are planned, the potential for shallow groundwater will require further evaluation. Investigations for natural fluctuations in shallow groundwater should include monitoring and observation programs through winter, spring, summer, and fall.

Entech states (p. 8), “Where shallow groundwater is encountered, underslab drains or interceptor drains may be necessary.” An underdrain system should be allowed ONLY if it can gravity discharge to a daylight outfall or is connected to an existing underdrain system that gravity discharges to a daylight outfall. Additionally, Entech states, “In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the intrusion of water into areas located below grade.” Individual foundation perimeter drains are intended to handle small amounts of intermittent, perched water and may NOT be used to mitigate persistent shallow groundwater conditions.

**Artificial fill** is present in limited areas within lots 12 and 36-38. CGS agrees that uncontrolled fill will require removal and recompaction beneath foundations. Any trash, waste, etc., should be properly removed from the site.

**OWTS suitability.** According to the El Paso County Soil Survey, the northeastern portion of the site is very limited in its suitability for conventional on-site wastewater systems (OWTS), described as septic tank absorption fields in the soil survey, due to low-permeability soils and shallow groundwater. CGS agrees with RESPEC’s report (p. 5), “It is anticipated that the majority of the lots will require designed systems.” Lot-specific testing will be needed to determine the need for and to design conventional or engineered sewage disposal systems.

Submitted 11/6/2023 by Amy Crandall, Engineering Geologist, Colorado Geological Survey (303-384-2632 or [acrandall@mines.edu](mailto:acrandall@mines.edu))