

COLORADO GEOLOGICAL SURVEY

1801 19th Street
Golden, Colorado 80401



Karen Berry
State Geologist

October 19, 2018

Kari Parsons
El Paso County Development Services
Planning Division
2880 International Circle, Suite 110
Colorado Springs, CO 80910

Location:
S½, NE¼,
Sections 32, 33,
T12S, R64W, of the 6th PM
38.9609, -104.5783

**Subject: Meadowlake Ranch - Sketch Plan,
File No. SKP184; El Paso County, CO; CGS Unique No. EP-19-0028**

Dear Kari:

The Colorado Geological Survey (CGS) has completed its site visit and review of the above-referenced project. We understand the applicant proposes *"to evaluate the feasibility of 85.5 acres of rural residential, 117 acres of urban density residential, 32 acres of commercial, and 93 acres of industrial land uses."* Well and septic systems are proposed for the rural residential portion of the development. The documents provided for our review included: Application and Letter of Intent (8.18), Master Development and Drainage Report (Terra Nova, 8.18), Sketch Plan (NES, 6.13.18), Preliminary Soil, Geology, Geologic Hazard, and Wastewater Study (Entech, 7.30.18) and various other documents.

Entech's report contains a very good description of the site's geology, surface and subsurface conditions and engineering properties, geologic hazards and development constraints. Entech's recommendations regarding mitigation of hazards and constraints related to shallow bedrock, expansive soils, artificial fill, erosion, floodplain, ponded water, shallow groundwater, seasonal shallow groundwater and potentially seasonally shallow groundwater areas are prudent and should be strictly adhered to. We offer the following comments and recommendations.

Groundwater, perched water and foundation drainage recommendations. Groundwater was observed in six of the eight borings and in one of the two pits. Levels ranged from 5 to 12 feet below ground surface. The presence of active drainages, wetlands, and ponded water within the site indicate that groundwater and perched water should be expected to occur at very shallow depths, at least seasonally. Groundwater levels will fluctuate and perched water is likely to collect above clayey, less permeable soil layers, on top of the bedrock surface, and within foundation excavations (which tend to be more loosely backfilled than the surrounding natural ground), as a result of landscape irrigation, runoff from roofs and paved areas, and infiltration from septic systems, causing wet or moist conditions in the soils immediately surrounding basement walls and foundations.

Since lowermost floor and crawlspace levels *must* be located at least three feet above maximum anticipated groundwater levels, **full-depth basements may not be feasible on all lots.** Additional investigations will be necessary, and basements should be considered only on lots where site-specific water level observations (preferably monitored through a full spring-summer-fall cycle) indicate that the 3-foot separation between lowermost floor or crawlspace levels and maximum anticipated groundwater surface can be maintained.

Individual perimeter foundation drain systems should be constructed on all lots, to help prevent infiltration of perched water (on lots where basements are determined to be feasible), and to help control wetting of

potentially collapsible (or loose) or expansive soils in the immediate vicinity of foundation elements. It is critical that the perimeter drains are sloped to discharge to an interior pumped sump or a gravity outlet that discharges water as far as possible away from all structures.

Soil and bedrock engineering properties.

Entech makes appropriate *preliminary* geotechnical recommendations based on the results of eight borings, and two test-pits, limited SPT's (standard penetration tests, an *in situ* test indicating relative density) and limited laboratory testing. They have identified sporadic areas of expansive soils within the site. We concur with Entech's recommendation that site specific, design-level geotechnical investigations be conducted for all proposed structures.

- The site specific foundation 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, water content, and swell and consolidation potential; identify unstable and potentially moisture-sensitive (expansive and collapsible) soils and expansive claystone bedrock; determine depths to groundwater and bedrock; evaluate the feasibility of full-depth basements, if planned; identify overexcavation areas, if stabilization (of loose soils) is determined to be necessary; and provide earthwork, foundation, floor system, surface and subsurface drainage, and pavement recommendations for design purposes.

Thank you for the opportunity to review and comment on this project. If you have questions or require further review, please call 303-384-2654, or e-mail jlovekin@mines.edu.

Sincerely,



Jonathan R. Lovekin, P.G.
Senior Engineering Geologist