

With this resubmittal, CGS received a request to provide Review Comments (Email dated October 9, 2023); Letter of Intent (N.E.S., Inc., October 2023); Sketch Plan (N.E.S., Inc., June 5, 2023); Soils and Geology Report (HDR, June 2023); and other documents. The applicant requests a Sketch Plan to permit a new railroad spur through the property to service Fort Carson and associated railroad-oriented heavy and light industry and commercial uses that encompasses 3100 acres of land.

HDR's characteristics of the site geology are valid but not all inclusive. Additionally, no test borings/pits were performed during their field investigation. Potential constraints identified in HDR's report include collapsible soils, expansive clays, swelling soils, bedrock exposures, slope instability, and debris flow. Other geologic conditions that must be addressed include erosion, potentially unstable slopes adjacent to the drainages/channels, shallow groundwater, and downslope creep/soil creep. Further investigation of the gravel pits that were noted by HDR and included in available geologic mapping, should be performed if development will occur in these areas. Future reviews by CGS may include additional comments about the geologic conditions during site-specific investigations. We offer the following comments and recommendations.

**Floodplain and erosion setbacks:** The Little Fountain Creek traverses the southern portion, and Rock Creek traverses the northern portion of the project area. Little Fountain Creek is designated a 100-year FEMA floodplain (FIRM Panel No. 08041C0965G and 08041C01155G, December 7, 2018) and described as "Zone A". Erosional setbacks from the creeks or any drainage/channel within the site should be established along with site grading that provides positive surface drainage and BMPs for stormwater. A slope stability analysis should be conducted in areas with steep slopes (>20 percent), or areas with slopes designated as unstable or potentially unstable. In addition, flooding and scour erosion mitigation for rail and road crossings should be implemented and maintained.

**Groundwater conditions:** The project is in a geologic setting and location known for shallow, fluctuating groundwater. Just as the natural drainages within the site will vary in flow rates annually and over differing years, shallow groundwater conditions are expected to fluctuate with differing precipitation events and seasons. During preliminary plan phases, site-specific data should be collected to evaluate the potential for shallow groundwater along with the fluctuations in groundwater elevations. Investigations for natural fluctuations in shallow groundwater should include monitoring programs that can be used during preliminary and final plans using site-specific groundwater elevation data. This should be combined with the evaluation of publicly available yearly precipitation data for this region.

**CGS does not object to conditional approval of the sketch plan provided that during the preliminary planning:**

- The soils and geology report is expanded/updated to include all the geologic constraints to development.
- A geologic hazard and constraint map is included in the soils and geology report and preliminary plans.
- Erosional setbacks from Rock Creek, Little Foundation Creek, and other drainages/channels within the parcel are established.
- Site-specific investigations with geotechnical borings are performed to characterize soil and bedrock engineering properties such as expansion/consolidation potential, density, strength, water content, etc.
- Shallow groundwater is investigated using site-specific monitoring for season variations. Yearly precipitation data, in conjunction with the monitoring program, should be used to evaluate expected variation in groundwater elevations.