EP-24-0077 Monument Ridge East
N½ Section 2, T11S, R67W, 6th Meridian
39.1284, -104.8624
File Number: SP241

With this referral, we received a request to provide Review Comments (Email dated 8/29/2024), Preliminary Drainage Report (PRC Engineering, 9/5/2024), Preliminary Plan Drawings (Bear Creek Surveying, Inc., 8/12/2024), Response to Review Comments and Soil and Geology Study (Revised) (Entech Engineering, Inc., 8/7/2024), and other documents. Entech updated Figure 7 (Geology/Engineering Geology Map) to the current site plan with the geologic hazards and constraints associated with the site. Additionally, the preliminary plan has been updated to reflect Entech's study.

1. Entech states in the response letter (page 1), "*The proposed grading indicates significant cuts of up to 20 to 24 feet across the site. Four piezometers were recently installed in areas of proposed cuts and where shallow water conditions were previously encountered in Test Boring Nos. 1 – 4."*

    a. CGS appreciates Entech's installation of the four monitoring wells within the site. Groundwater depths between 6 to 16.2 feet were recorded in August 2024. It is crucial that these groundwater elevations continue to be measured during Fall/Winter/Spring 2024/2025 and after early grading operations. This is necessary to determine the extent of shallow groundwater impacts on the overall development, as mandated by the El Paso County code.

    b. The groundwater depths measured in the monitoring wells appear shallower than the proposed final grades for some of the development. We agree with Entech (page 12 of their revised report) that "Foundations should maintain a minimum separation of 3 feet between the foundation grade and the maximum anticipated groundwater level." If the minimum separation cannot be achieved (as determined from the continued groundwater monitoring/observation program) and mitigation measures are not possible (such as raising site grades well above maximum groundwater elevations based on a minimum yearlong monitoring program or a properly functioning area groundwater collection system (subsurface underdrain system) for the development, see Item 2.a below), then **NO basements** or other below-grade spaces (crawlspaces, walkouts, etc.) should be permitted within Monument Ridge East.

2. Entech states in the response letter (page 1), *"Significant drainage improvements and interceptor drains are planned. Additional site investigation will be conducted during the development process and recommendations regarding an underdrain system will be provided. The underdrain system must have a daylight to function properly.*

    a. CGS recommends that the preliminary plans include a statement indicating "no basements or other below-grade spaces allowed" or that mitigation measures, such as raising the site grades, be incorporated. We understand that site-wide drainage improvements are being considered for this development. An area groundwater collection system (subsurface underdrain system) must gravity discharge into an inlet structure or detention pond without any possibility of back flow or blockage. Subsurface underdrain systems should be designed in accordance with the El Paso County Engineering Criterial Manual (C.6.2.E) and shown on the plans.

3. Wetlands (Freshwater Emergent/Freshwater Forested/Shrub Wetland) are located within the site. Setbacks and "no build" areas should be noted on the plans.

4. Entech states in the response letter (page 2), "*Entech is in agreement that filling of the natural drainages will not mitigate the shallow groundwater conditions and an underdrain system will be needed. Additional site investigation will be conducted during the development process and recommendations regarding an underdrain system will be provided. The underdrain system must have a daylight to function properly*." This statement addresses our previous comment. Requirements for the underdrain and a statement indicating lots above these areas should be further evaluated during site-specific geotechnical investigations to determine the impact (i.e., groundwater conditions, differential settlement, etc.) on future development should be noted in the plans.

Submitted 9/18/2024 by Amy Crandall, Colorado Geological Survey: acrandall@mines.edu