

# COLORADO GEOLOGICAL SURVEY

1801 19<sup>th</sup> Street  
Golden, Colorado 80401



Karen Berry  
State Geologist

February 6, 2018

Raimere Fitzpatrick  
Project Manager  
El Paso County Development Services Dept.  
2880 International Circle, Suite 110  
Colorado Springs, CO 80910

**Location:**  
SW of Sec. 28 / SE of Sec. 29,  
T11S, R67W of the 6<sup>th</sup> PM  
39.060, -104.8562

**Subject: Forest Lakes Phase II PUD Amendment/Preliminary Plan**  
**El Paso County, CO File No. PUDSP181; CGS Unique No. EP-18-0046**

Dear Mr. Fitzpatrick:

The Colorado Geological Survey has reviewed the Forest Lakes Phase II PUD Amendment referral. We understand that the applicant proposes to amend the Forest Lakes PUD/Preliminary plan to increase the number of lots from 131 to 231 and reconfigure the internal subdivision layout. For this referral, we reviewed the following documents:

- Letter of Intent (N.E.S. Inc., December 2017), Legal Description: Phase 2 PUD/DA (Classic Consulting Engineers & Surveyors, August 17, 2017),
- Forest Lakes PUD Development Plan and Preliminary Plan for Phase 2 (N.E.S. Inc., December 20, 2017 – 15 sheets), and
- Master Plan Level Geologic Hazards Evaluation and Preliminary Geotechnical Investigation, Forest Lakes Master Development Plan (CTL/Thompson, Inc., August 15, 2001).

The CTL/Thompson report identified the following potential geologic hazards, engineering constraints, and natural hazards that may affect development in the Phase II area:

- Debris flows and hyperconcentrated flooding
- Expansive soils and bedrock
- Potentially Unstable Slopes
- Shallow Groundwater
- Rockfall
- Consolidation
- Erosion
- Seismicity
- Flooding
- Disturbed areas and potentially uncontrolled fill

CGS agrees that these hazards and constraints are present and may adversely affect development within the Phase II development area. The currently proposed Phase II amendment significantly increases development density in areas where CTL/Thompson identified potential hazards/constraints, or where the subsurface investigation information is relatively sparse. CGS cannot recommend approval of the proposed development until an updated geologic hazards and geotechnical investigation report is prepared that addresses debris flow/debris flood (hyperconcentrated flood), shallow groundwater, collapsible soils (consolidation), potentially unstable slopes, and erosion hazards to the reconfigured Phase II lots. Specifically, CGS recommends the

following additional information:

**Debris Flow/Debris Flood (Hyperconcentrated Flood)**

Lots 25-26, 54-85, 127-138, 154-157, and 229-231 are either located on or near areas mapped by CTL/Thompson as exposed to debris flow or debris flood hazards. CTL/Thompson stated that debris flows were addressed in the Forest Lakes Master Development Drainage Plan. It is not common for a subdivision drainage plan to cover debris flow hazards; CGS has not received a copy of this drainage plan for review, and it is therefore unclear whether the debris flow evaluation and mitigation methods are sufficient to protect the exposed lots. An updated debris flow hazard analysis and mitigation plan that addresses potential peak debris flow discharge, flow depths, impact energies, and runoff heights, and any necessary mitigation should be provided for the potentially exposed lots.

**Shallow Groundwater**

Lots 53-90, 121-144, and 154-219 are located in relatively low-lying areas on fans or adjacent to streams where shallow groundwater can be expected, where dark vegetation can be seen on aerial imagery, and where CTL/Thompson subsurface information is sparse. The CTL/Thompson borings in these areas appear to be located near rocky outcrops and hillslopes, and are not sufficient to adequately evaluate shallow groundwater conditions beneath these lots. Additional subsurface borings should be performed to gather evaluate geologic and groundwater conditions at these locations.

**Collapsible Soils (consolidation)**

Lots 30-37, 53-90, 121-144, and 154-224 are located on or near fans and areas where CTL/Thompson's surface mapping indicates potentially collapsible soils. The CTL/Thompson borings in these areas appear to be located near rocky outcrops and hillslopes, and are not sufficient to adequately potentially collapsible soil conditions beneath these lots. Additional subsurface borings should be performed to evaluate gather evaluate geologic and groundwater conditions at these locations.

**Potentially Unstable Slopes**

Lots 12-18 are in an area where significant grading is proposed. CTL/Thompson recommended limiting permanent cuts and fills to no steeper than 3:1 for optimal performance and erosion control, and performing individual slope stability analyses for any slopes higher than about 15 feet with slopes of 3:1 or steeper. CTL/Thompson's recommendations regarding cut and fill slopes, individual lot slope stability analyses, and engineered retaining systems should be carefully followed in this area. The applicant's geotechnical engineer should perform any necessary slope stability analyses and recommend maximum cut and fill heights as necessary.

**Erosion**

As stated by CTL/Thompson, the entire area is subject to erosion hazard. CTL/Thompson's recommendations regarding erosion control and prevention should be followed.

Reimere Fitzpatrick  
February 6, 2018  
Page 3 of 3

Thank you for the opportunity to review and comment on this project. If you have questions, please contact me by phone at 303-384-2632 or e-mail kemccoy@mines.edu.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kevin McCoy". The signature is fluid and cursive, with the first name "Kevin" and the last name "McCoy" clearly distinguishable.

Kevin McCoy  
Engineering Geologist