COMPLETE ENGINEERING SERVICES, INC.

PROJECT NO: 25-12461
February 27, 2026

Ms. Kathryn Latsis
Latsis Custom Homes
1681 S. Uintah Way
Denver, CO 80231

SUBJECT: CZ25-002 Mountain View Gardens - Tree Farm
Arapahoe County, CO; CGS Unique No. AR-26-0009-4
February 9, 2026

REFER: CES, Submission Review Comments and Addendum to Project No. 25-12461, October 10, 2025, Parcels 8 and 11, Tract 12, Mountain View Gardens Subdivision, Arapahoe County, Colorado, January 26, 2026

Ms. Latsis:

We are providing responses to comments presented in the referenced review notice from the Colorado Geological Survey (CGS). Information presented herein is based on referenced comments, which are included herein, the referenced comments and report addendum, published information, applicable codes and standards, and our experience with similar conditions. Information and references contained in the referenced Submission Review Comments are included herein by reference.

CGS Comment:

CGS calculates, based on a typical assumed wetting depth of at least 15 feet for geotechnical design of new construction, that the site-specific average measured consolidation of 1.6% would correspond to potential settlement on the order of approximately 3 inches if soils within that depth range were fully wetted. This would be expected under the infiltration basin, but we are not worried about settlement under the pond itself, we are concerned about impacts to homes on lots adjacent to the infiltration basin.

CES Response:

CGS is confusing the zone of wetting with saturation. Moisture from the new development may infiltrate into the soil and affect moisture content to a depth of 15 feet. It is very unlikely that that surface infiltration around the new structures will saturate the soil to a depth of 15 feet. The CGS estimated settlement of three inches is based on saturated soil conditions.

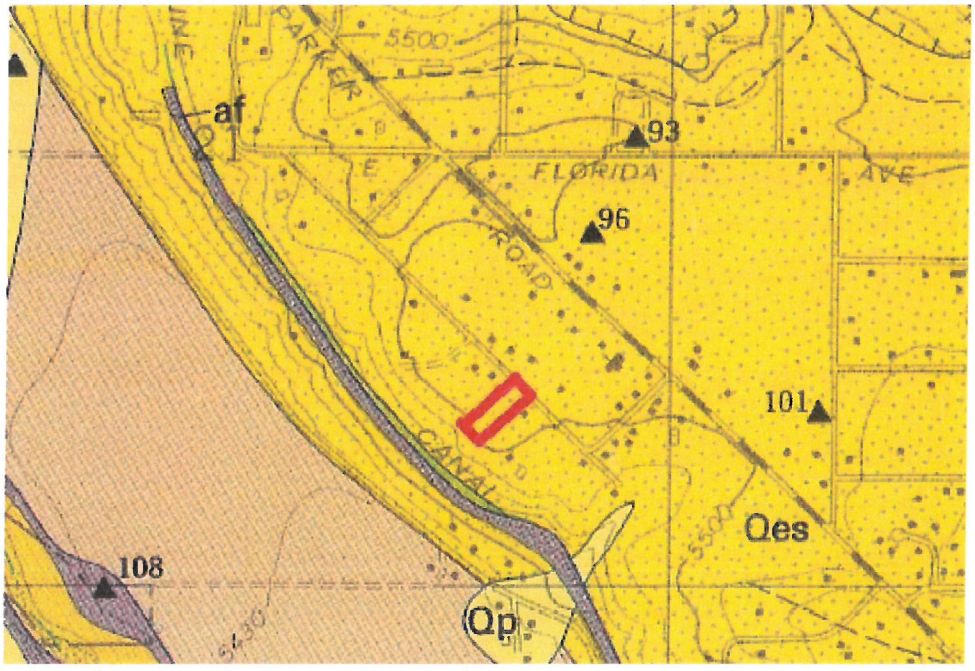
Possible settlement on the order of three inches might be expected beneath the infiltration basin. That area may achieve saturation to a depth of 15 feet below the ground surface. Three inches of settlement beneath the proposed structures is unlikely.

CGS Comment:

The lateral extent and thickness of surficial soils that could experience wetting in response to infiltration from the retention pond is unknown. CES (page 3) describes the site soils as having "high permeability," and states, "The mapped deposits of eolian sand extend well beyond the proposed development so groundwater will not be trapped beneath this property or adjacent properties." The mapping referenced by CES was conducted at a scale of, at best, 1:24,000 or 1 inch = 2000 ft. so is not of sufficient resolution to make valid assumptions about the lateral continuity of subsurface materials.

CES Response:

CES agrees that USGS geologic map scale is large and exact extent of mapped units may vary significantly from actual unit boundaries. The eolian sand unit mapped by the USGS extends far beyond the boundaries of this development in all directions. A portion of the USGS map for this area is shown in Figure 1, Geological Map, Tree Farm Subdivision, with the approximate site location indicated in red.



Qes: Eolian Sand Deposits

Figure 1: Geological Map Tree Farm Subdivision

A smaller scale soil map has been prepared based on data available from the United States Department of Agriculture (USDA) Web Soil Survey and is presented in Figure 2, Web Soil Survey Map. Soils in, and around, the subject property are mapped as loamy sands. Mapped eolian sand units extend far beyond property boundaries at this scale also.

TrB: Truckton Loamy Sand, 0-3 percent slopes
TrC: Truckton Loamy Sand, 3-5 percent slopes
TrD: Truckton Loamy Sand, 5-9 percent slopes

(Detailed soil properties and descriptions are presented in Appendix A)

Figure 2: Web Soil Survey Map

CGS Comment:

Potential for development of a perched water condition on top of the variably shallow (18 to 28 feet below the existing ground surface), less permeable claystone bedrock surface remains a concern. CGS recognizes that the infiltration pond is probably hydraulically downgradient of the proposed new lots, but clayey layers, lenses, and pockets within the surficial soils could result in unpredictable impacts to adjacent lots. Even in areas not currently impacted by shallow groundwater, long-term infiltration can create a new localized groundwater mound that did not

previously exist, and wetting fronts radiating from below the basin could move outward and affect adjacent foundations.

In the absence of a quantitative analysis demonstrating that lesser separations would be protective, CGS continues to recommend modifying the lot configuration so that the infiltration basin is at least 100 feet from all adjacent structures, including existing homes. This should reduce, but will not eliminate, the risk of damage due to hydrocompaction, development of a perched water condition, and infiltration into nearby basements and crawl spaces.

CES Response:

The Simulation of Groundwater Mounding Beneath Hypothetical Stormwater Infiltration Basins, U.S. Geological Survey Scientific Investigations Report 2010-5102, referenced by CGS has been reviewed and a quantitative analysis has been conducted. Information contained in the report, and presented in Figure 3, Simulated Groundwater Mounding Beneath a Hypothetical Stormwater Infiltration Basin, indicates that groundwater mounding will be minimal and the extend of any mounding that may occur will be limited.

able 2. Simulated groundwater mounding beneath hypothetical stormwater-infiltration basins on a 10-acre development.—Continued

ft², square feet; 1 x 1, square basin (sides of equal length); 1 x 8, rectangular basin (long side eight times length of short side); in/hr, inches per hour; Max, maximum; ft², square feet; GW, groundwater; gt, height; ft, feet; EEoB, east edge of basin]

Simulation number	Impervious cover (percent)	Design storm (inches)	Basin depth (feet)	Basin area (ft²)	Basin shape	Aquifer thick-ness (feet)	Soil permea-bility (in/hr)	Specific yield (percent)	Max GW mound height (feet)	Max extent of 0.25-foot GW mound hgt (feet)	GW mound hgt at EEoB (feet)	GW mound hgt 50 ft from EEoB (feet)	GW mound hgt 100 ft from EEoB (feet)	GW mound hgt 150 ft from EEoB (feet)	GW mound hgt 200 ft from EEoB (feet)	GW mound hgt 300 ft from EEoB (feet)	GW mound hgt 500 ft from EEoB (feet)
91	10	1.25	2	2,269	1 x 8	10	0.2	17.0	5.03	36	4.22	0.11	0.01	0.00	0	0	0
92	10	1.25	2	2,269	1 x 8	10	0.2	8.5	6.74	64	6.01	0.56	0.05	0.01	0	0	0
93	10	1.25	2	2,269	1 x 8	10	1	17.0	2.36	66	2.13	0.44	0.08	0.02	0	0	0
94	10	1.25	2	2,269	1 x 8	10	1	8.5	2.85	105	2.64	0.92	0.30	0.09	0.02	0	0
95	10	1.25	2	2,269	1 x 8	10	5	17.0	0.83	73	0.77	0.35	0.17	0.08	0.03	0	0
96	10	1.25	2	2,269	1 x 8	10	5	8.5	0.92	107	0.86	0.46	0.28	0.17	0.09	0.03	0
97	10	1.25	2	2,269	1 x 8	20	0.2	17.0	4.43	39	3.76	0.14	0.02	0.00	0	0	0
98	10	1.25	2	2,269	1 x 8	20	0.2	8.5	5.90	71	5.29	0.64	0.09	0.02	0.01	0	0
99	10	1.25	2	2,269	1 x 8	20	1	17.0	1.91	68	1.73	0.42	0.11	0.03	0.01	0	0
100	10	1.25	2	2,269	1 x 8	20	1	8.5	2.25	110	2.09	0.76	0.31	0.13	0.05	0.01	0
101	10	1.25	2	2,269	1 x 8	20	5	17.0	0.58	48	0.54	0.25	0.14	0.08	0.04	0.01	0
102	10	1.25	2	2,269	1 x 8	20	5	8.5	0.63	69	0.59	0.31	0.20	0.13	0.09	0.04	0.01
103	10	1.25	2	2,269	1 x 8	40	0.2	17.0	3.72	46	3.24	0.21	0.02	0.01	0	0	0
104	10	1.25	2	2,269	1 x 8	40	0.2	8.5	4.91	77	4.45	0.79	0.11	0.03	0.01	0	0
105	10	1.25	2	2,269	1 x 8	40	1	17.0	1.47	69	1.36	0.42	0.13	0.04	0.01	0	0
106	10	1.25	2	2,269	1 x 8	40	1	8.5	1.69	105	1.58	0.64	0.28	0.13	0.06	0.02	0
107	10	1.25	2	2,269	1 x 8	40	5	17.0	0.41	26	0.38	0.18	0.10	0.06	0.04	0.02	0
108	10	1.25	2	2,269	1 x 8	40	5	8.5	0.43	34	0.41	0.21	0.13	0.09	0.07	0.04	0.01
109	10	1.25	0.5	9,075	1 x 1	10	0.2	17.0	2.15	18	1.19	0.03	0.00	0.00	0	0	0
110	10	1.25	0.5	9,075	1 x 1	10	0.2	8.5	3.72	39	2.17	0.16	0.01	0.00	0	0	0
111	10	1.25	0.5	9,075	1 x 1	10	1	17.0	1.41	34	0.88	0.15	0.03	0.00	0	0	0
112	10	1.25	0.5	9,075	1 x 1	10	1	8.5	1.85	68	1.27	0.39	0.12	0.03	0.01	0	0
113	10	1.25	0.5	9,075	1 x 1	10	5	17.0	0.54	26	0.40	0.18	0.08	0.04	0.01	0	0
114	10	1.25	0.5	9,075	1 x 1	10	5	8.5	0.61	51	0.48	0.26	0.15	0.09	0.05	0.01	0
115	10	1.25	0.5	9,075	1 x 1	20	0.2	17.0	2.06	20	1.13	0.04	0.01	0.00	0	0	0
116	10	1.25	0.5	9,075	1 x 1	20	0.2	8.5	3.37	43	1.98	0.20	0.03	0.01	0	0	0
117	10	1.25	0.5	9,075	1 x 1	20	1	17.0	1.16	34	0.74	0.16	0.04	0.01	0	0	0
118	10	1.25	0.5	9,075	1 x 1	20	1	8.5	1.45	66	1.01	0.35	0.14	0.06	0.02	0	0
119	10	1.25	0.5	9,075	1 x 1	20	5	17.0	0.38	5	0.28	0.13	0.07	0.04	0.02	0.01	0
120	10	1.25	0.5	9,075	1 x 1	20	5	8.5	0.41	16	0.32	0.17	0.11	0.08	0.05	0.02	0

Figure 3: Simulated Groundwater Mounding Beneath a Hypothetical Stormwater Infiltration Basin.

Figure 3 shows results of a groundwater mounding simulation using the Hantush equation presented in Report 2010-5102. This simulation is for a 1.25 inch storm with a 20 foot deep layer above a confining layer (aquifer or bedrock) with a ten acre site and a 9000 square foot infiltation basin. The analysis indicates that the maximum groundwater mound height for the soil present beneath the subject property is less than two feet. The increase in groundwater height at 50 feet from the basin is less than 1/2 foot. The subject property is less than 10 acres and runoff from the design storm will be less than volumes used to calculate groundwater mound height.

Results of our further analysis supports our conclusions that:

1. Soils beneath this site are suitable for supporting lightly loaded foundations from residential structures.

2. Soils beneath the proposed stormwater infiltation basin are well suited for managing the anticipated storm runoff.

3. Goundwater mounding that may occur from the proposed infiltration basin will be minimal and will not affect surrounding properties.

Please contact us if you have questions concerning this information.

Complete Engineering Services, Inc.,

COLORADO REGISTERED EDWARD D. FORD 22351 2-27-26 PROFESSIONAL ENGINEER

Edward D. Ford, P.E.

Edward D. Ford

Digitally signed by Edward D. Ford
Date: 2026.02.27 11:06:28 -07'00'

Attachments: Appendix A

References:

Shroba, R.R., Geologic Map and Physical Properties of the Surficial and Bedrock Units of the Engewood Quadrangle, Denver, Arapahoe, and Adams Counties, Colorado, United States Geological Survey, GQ-1524, 1980

Carleton, G.B., 2010, Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins: U.S. Geological Survey Scientific Investigations Report 2010-5102, 64 p
Link: https://pubs.usgs.gov/sir/2010/5102/

APPENDIX A
USDA Soil Unit Properties and Descriptions

Truckton Loamy Sand – 0 to 3 percent slopes

Properties and qualities

- *Slope:* 0 to 3 percent
- *Depth to restrictive feature:* More than 80 inches
- *Drainage class:* Well drained
- *Runoff class:* Very low
- *Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum content:* 1 percent
- *Maximum salinity:* Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Low (about 4.4 inches)

Truckton Loamy Sand – 3 to 5 percent slopes

Properties and qualities

- *Slope:* 3 to 5 percent
- *Depth to restrictive feature:* More than 80 inches
- *Drainage class:* Well drained
- *Runoff class:* Very low
- *Capacity of the most limiting layer to transmit water (Ksat):* High (2.13 to 7.09 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum content:* 1 percent
- *Maximum salinity:* Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

Tructon Loamy Sand – 5 to 9 percent slopes

Properties and qualities

- *Slope:* 5 to 9 percent
- *Depth to restrictive feature:* More than 80 inches
- *Drainage class:* Well drained
- *Runoff class:* Low
- *Capacity of the most limiting layer to transmit water (Ksat):* High (2.13 to 7.09 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum content:* 1 percent
- *Maximum salinity:* Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Low (about 4.5 inches)