Colorado Department of Transportation
Arthur Gonzales
R2 – Access Manager
RE: Meadowlake Ranch Sketch Plan_EA17227_SKP184 – Revised Addition of Hydraulic Review

Per your review dated 2/28/19 for Meadowlake Ranch MDDP, we offer the following responses to your comments.

Comment a. Page 6: *"Therefore, existing runoff from the Meadowlake Ranch site does not contribute to Bennett Ranch Regional Detention Pond outflows and runoff from the proposed conditions will be routed away from that conveyance route as well". Does this change historic drainage patterns?*

Response: No, the historic drainage patterns flow to the southeast on the Meadowlake Ranch property away from the Bennett Ranch Regional Detention Pond outlet drainage way and will continue to do so. I will clarify that the proposed conditions will maintain historic drainage patterns.

Comment b. Page 7: *Prove that this area doesn't contribute to downstream flows. Seems odd to eliminate basin area from analysis, especially since there is evidence of flows downstream of these wetland areas (natural swale, 24" CMP culvert under Judge Orr). Please show proof that this area can be removed from the hydrology.*

Response: The flow that crosses under Judge Orr Road downstream of the wetlands/ponds area comes from the drainage basin west of the wetlands/ponds. The ponds do not have outlet structures and the berms are vegetated and stable. El Paso County requested additional analysis of this area and a revised MDDP was submitted in early March. Below is the discussion from the revised report.

> The existing ponds/wetlands area will remain as part of an open space area for the proposed development. This location was analyzed by dividing the wetland area into three basins (WP-A, WP-B, and WP-C) according to the three major areas of standing water (see Exhibit in Appendix) and determining the runoff volumes for the developed 100 year event. The 100 yr developed runoff volumes are as follows: WP-A = 4.0 ac-ft, WP-B = 5.8 ac-ft, and WP-C = 1.6 ac-ft. To retain these ponds/wetlands in the future development, these runoff volumes should be multiplied by the appropriate safety factor and the berms re-graded to provide adequate storage above the pond-full elevation plus freeboard. Calculations for the runoff volumes are included with the Exhibit in the Appendix. The ponds and spillways to remain will be evaluated for safety/stability by a geotechnical engineer. The appropriate hydrologic, hydraulic, and geotechnical analyses for this area must be included in the future Drainage Report.

Comment c. Page 8: *Tributary area and runoff discharge should include the 63 acre wetland basin. This will require improvements downstream. However, this outfall seems to have been analyzed already, and recorded with FEMA. See attached FIRM map, effective December 7, 2018. Please update discussion of this basin.*

Response: As discussed above, the wetland/pond area will be retained in the proposed development and the berms regraded to attain the required runoff storage. The exact storage will depend on the development details, which are unknown at this time. The FIRM will be updated in the MDDP. The MDDP addresses the need for a detailed analysis of the Judge Orr Rd crossing, but such an analysis will be addressed in a future Drainage Report. The pertinent portion of the MDDP is included below.

> The headwater to depth ratio for a 24" pipe under inlet control is HW/D= 0.6 for the 5 year event and HW/D= 3.0 for the 100 year event (see Exhibit in the Appendices). At HW/D=3.0, Judge Orr Road would be overtopped. Therefore, the 24" pipe culvert may need to be upgraded. However, the downstream drainage way for Design Point 1 will need to be further studied in future Drainage Reports to assess the impact to Design Point 1 because just downstream of Judge Orr Rd the flow goes east under Rock Island Trail via a 42" CMP and into the ditch area between the trail and State Highway 24. The flow then passing southeast under Highway 24 is restricted by an 18" opening on the inlet end of a 10'x5' box culvert. Presumably, the runoff would pond between the State Highway 24 and Rock Island Trail, as well as the area between Rock Island Trail and Judge Orr Road. Potentially, the ponding could also extend to the north side of Judge Orr Road.