

19 March 2013

Heidi Schum, P.E.
City of Boulder
Planning & Development Services
1739 Broadway
Boulder, CO 80302

Re: **Response to Public Questions**
Boulder Creek Commons Subdivision
01/30/13 Neighborhood Open House

File: B1006

Dear Ms. Schum,

Thank you for the opportunity to provide responses to the public questions made during and after the 30 January 2013 Neighborhood Open House for the *Boulder Creek Commons Subdivision*. We have reviewed each of the questions outlined in your email dated 02/21/13. For ease of reference, we have restated the question and provided a response immediately below the question.

Site Plan/Construction

1. The engineering drawing of the site shows a 12 foot wide path over the buried irrigation pipe along dry creek ditch. Who will be responsible for maintaining the path after the development is complete?

Response: The Home Owners Association will be responsible for maintaining this path.

2. Will the path be paved, dirt, or gravel?

Response: The path will be reinforced turf or surfaced with a granular material. A concrete walk will meander within the access width.

3. In the event that it is dirt or gravel, how will the weeds be dealt with?

Response: The Home Owners Association will be responsible for maintaining the path including weed mitigation.

4. Almost every neighbor adjacent to the ditch/path has mature trees and most of the trees overhang the present ditch. Major excavation will be required to bury the dry creek ditch pipe, put in the path, and put in the flood channel. Will there be an impact to the trees during construction and with future maintenance?

Response: Shallow excavation is required to install the Dry Creek Ditch No. 2 pipe. The excavation will extend 2-3 feet below the existing ditch grades to accommodate the 30" pipe and pipe bedding material. The excavation to construct the flood channel is also shallow. During construction, tree roots that extend into the excavation zones on the Boulder Creek Commons property will be trimmed at the trench edge. Future maintenance activities will not impact trees on adjacent neighbors' properties.

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Flood

5. The proposed flood channel depth appears to be 2.5 feet. What are the flood elevations in the channel? Will the flood level in the channel be higher than existing flood levels or adjacent homes?

Response: The flood channel depth is 2.8-ft. The 100-year flood water depth is 2.5-ft. During 100-year flood flow, the 100-year water surface elevation in the flood channel will be at or below current 100-year flood water surface levels.

6. Does the 177 cfs flood flow include the flows along the Superphostical/Howard ditch that ditch is just over the property line? Why or why not? Would be safe to assume it carries at least the same amount of flood waters as Dry Creek ditch (177CSF)?

Response: Flood waters within the Howard-Superphostical lateral are not being conveyed by the proposed flood channel. Information on the Howard-Superphostical lateral flows may be requested from the City of Boulder.

7. How fast does the flooding come into the property?

Response: As part of the South Boulder Creek Flood Mapping Study, the City of Boulder prepared a time lapse animation of the South Boulder Creek 100-year flood. This animation can be viewed at the "South Boulder Creek Flood Mitigation Planning Study" website. Further information may be requested from the City of Boulder.

8. How long does the flooding last?

Response: This question is beyond the scope the development proposal. This information may be requested from the City of Boulder.

9. What is the overall flood volume and duration?

Response: This question is beyond the scope the development proposal. This information may be requested from the City of Boulder.

10. What will the depths of the 100 and 500 year FEMA floods be at Kewanee?

Response: The development of the Boulder Creek Commons Subdivision will not increase current flood depths in Kewanee Drive.

11. How much volume and flow will be directed along the street systems out to that north end in the 500 year flood?

Response: The development of the Boulder Creek Commons Subdivision allows the 500-year flood flows to pass through the property without impacting either the overall flood volume or the existing flood flow discharge point at the northwest corner of the property.

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12. Is the flood channel height 2.8 feet above the base elevations of the channel shown on the site plan?

Response: The flood channel depth is measured from the flowline elevation of the channel.

13. Only flood channel flow rates are given but not storm duration or storm volume. Did they not provide or use hydrographs? Is this normal in designing such a floodway?

Response: For the localized storm events, hydrograph routing was used to determine peak flow 10-year and 100-year storms. The hydrograph routing results are presented in the "Preliminary Storm Water Report for the Boulder Creek Commons Subdivision".

The City of Boulder used an advanced floodplain modeling software called MIKE FLOOD to simulate flood water conveyed in channels and across the overland floodplain. The South Boulder Creek flood model used hydrograph routing to route the flood through the floodplain. The City determined peak 100-year flood flows specific to the Boulder Creek Commons site using the MIKE FLOOD model for South Boulder Creek. These peak 100-year flood flows rates were used to size the overall flood channel geometry. Open channel design based on peak flow rates is a standard engineering practice.

14. With the regrading of the EBCC soccer fields a 20,000 square foot pile of earth was removed and the entire south end was regraded. The width of the flood channel on the north was reduced from 150 feet to 100 feet due to 2-5 feet of fill being brought in right to the western boundary. How will these changes affect both the pre and post development flood flows?

Response: This question is beyond the scope of the Boulder Creek Commons Subdivision development application and is best addressed by the City of Boulder.

15. The flood channel was designed with only knowing the peak flow value. Is it typical to design such channels without hydrographs or flood volumes?

Response: The flood channel was designed to convey peak flood flows through the Boulder Creek Commons Subdivision. Sizing an open channel based on peak flow rates is a standard engineering practice.

Groundwater

16. Why are area drains proposed on the site?

Response: Area drains for collecting groundwater are not proposed on the site. This question is not applicable to the project.

17. What is the location and depth of the area drains?

Response: Area drains for collecting groundwater are not proposed on the site. This question is not applicable to the project.

18. How much water is projected to be moved by the drains?

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Response: Area drains for collecting groundwater are not proposed on the site. This question is not applicable to the project.

19. Where will the water be routed to?

Response: Area drains for collecting groundwater are not proposed on the site. This question is not applicable to the project.

20. Is the developer intending to route groundwater through the drainage swales?

Response: No. The drainage swales are located above the ground water table. The purpose of the drainage swales is to collect and convey surface storm water through the subdivision.

21. Will the underdrains compromise the core function of the swales, i.e., to capture and detain stormwater runoff?

Response: A subdivision wide underdrain system is not proposed for the subdivision.

22. Will the underdrains either decrease groundwater flows to the wetlands to the east or increase the flows for the adjacent homes to the west and north?

Response: A subdivision wide underdrain system is not proposed for the subdivision. This question is not applicable to the proposed project.

23. Will moving groundwater to the north of the site exacerbate the sump pumping problems for the adjacent homes?

Response: A subdivision-wide underdrain system or other similar ground water diversion systems are not proposed for the subdivision. This question is not applicable to the proposed project.

24. Will the ditch company accept the groundwater?

Response: Groundwater diversion is not proposed for this subdivision. This question is not applicable to the project proposal.

25. Is intercepting groundwater flow at this scale legal under state law?

Response: Groundwater diversion is not proposed for this subdivision. This question is not applicable to the project proposal.

26. There is a large amount of water brought into the area by the Bodam lateral. Why is this feature not mentioned in the submitted Groundwater Reports? There is a junction box on the lateral at the southeast corner of the property where a 15 inch pipe diverts considerable flow to the northwest to feed the decorative pond. In the wetlands report the pond is described as being fed by the lateral from the north. The pond is fed by the lateral branch from the south and the pond's outlet runs north.

Response: Irrigation occurring on the Bodam property is mentioned in both the 2010 and 2012 reports.

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27. The Dry Creek #2 Ditch lateral rarely ever flows. How is this addressed in the recharge estimates in the Groundwater Reports?

Response: The portion of Dry Creek Ditch No. 2 that runs along the west side of the proposed development flows consistently during the irrigation season due to inflow from the Bodam lateral. In order for ground water levels to rise, additional water beyond historical sources needs to be added to the ground water system. Thus, the most relevant question is whether the development will increase recharge to the ground water system. The proposal to line this portion of Dry Creek Ditch No. 2 will result in a reduction in recharge to the ground water system. Therefore, ground water levels will not rise as a result of the proposed development.

28. Through development, is the groundwater table typically lowered? What is the mechanism for this lowering?

Response: In order for ground water levels to rise, additional water beyond historical sources needs to be added to the ground water system. Therefore, the relevant question is whether the development will increase recharge to the ground water system. As proposed, the development will reduce recharge to the ground water system. Thus, ground water levels will not rise as a result of the proposed development.

29. Are the bottom of the proposed drainage swales on site located below the measured high groundwater levels?

Response: No. Refer to question 20.

30. In the 2012 groundwater report the leakage along dry creek ditch is quantified as follows: “The estimated leakage rate of 64.7 also corresponds well to the average rate used by the ditch company for estimating ditch leakage. When using the ditch company’s leakage rate of 20%, and a flow rate equal to the piped ditch design capacity (28 gpm), the average leakage rate across the Project area is calculated to be approximately 51.5 gpm.” How is this leakage rate applied? What is the actual flow along the ditch that the 20% is applied to?

Response: In order for ground water levels to rise, additional water beyond historical sources needs to be added to the ground water system. Therefore, the true question is whether the development will increase recharge to the ground water system. The proposal to line portion of Dry Creek Ditch No. 2 along the west side of the proposed development will result in a reduction in recharge to the ground water system. Thus, ground water levels will not rise as a result of the proposed development.

31. The 2012 Groundwater report provides well depth measurements through 5/9/2012. Did they take measurements after May 9th?

Response: Depth to water data was also measured on July 19, 2012.

B-1	B-2	B-3	B-4	PVC--SE	PVC-SW
3.89	4.26	3.69	3.98	3.90	4.735

32. Is the developer in negotiations with any property owners or the ditch company concerning current irrigation practices?

Response: The applicant has no jurisdiction over other land owners’ irrigation practices.

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33. In Appendix A of the May 2010 Groundwater Hydrology Monitoring & Wetland Delineation Report ditch flow measurements are reported for the west and east laterals. When converting from cubic feet/second to gallons/minute the conversion factor of 0.13368 was applied incorrectly. Instead of dividing by the conversion factor the CFS is multiplied by the conversion factor. In other words there are 7.5 gallons per cubic foot, not 1/7.5 gallons. Was this corrected?

Response: Yes, the conversion error was noted and corrected prior to subsequent release of the report to the Corps of Engineers. The 2010 report cited in the question is an outdated report. The Annexation/Initial Zoning and Site Review applications currently under consideration for approval by the City are based on the October 2011 "City of Boulder Wetland Delineation Report for the Boulder Creek Commons Property" prepared by Western Ecological Resource, Inc. The 2011 study presents the delineation of the wetlands as of 2011 and is based on site information monitored or observed in 2011.

The above information is provided to address the concerns expressed by the neighbors and to correct some of the misperceptions that the neighbors have about this property. If you have any questions or comments, please feel free to contact me at 303.981.9238 or email me at lewy@thesanitasgroup.com.

Sincerely,

The Sanitas Group, LLC



Leslie R. Ewy, P.E.

Principal/Civil Engineer
LEED AP BD+C and ND

CC: Michael Boyers - BCC, LLC

RESPONSES TO PUBLIC QUESTIONS
01/19/2012 PLANNING BOARD HEARING
CONCEPT PLAN REVIEW

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