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To The Lakewood Planning Commission:

I have been asked by Save Belmar Park, Inc. to review and comment on certain matters related to the proposed multifamily development at 777 South Yarrow St in Lakewood, Colorado. Documents related to the proposed development I have reviewed include the following:

- Erosion and Sediment Control Report (ESCR), 777 South Yarrow Street Multifamily. Report prepared by Kimley-Horn and Associates, Inc. for Kairoi Properties, LLC. Prepared April 2022 and Revised November 2024. 222 pages. The version I reviewed included redline comments from City of Lakewood Engineering Development Assistance dated 02/19/2025.
- Final Drainage Report (FDR), 777 S. Yarrow St. Multifamily, 777 South Yarrow Street, Lakewood, Colorado. Prepared by Kimley-Horn and Associates for Kairoi Properties, LLC. Prepared April 27, 2022, and Revised November 18, 2024. 96 pages. The version I reviewed included redline comments from City of Lakewood Engineering Development Assistance dated 02/19/2025.
- 777 S Yarrow St Multifamily, Lakewood, CO Major Site Plan (MSP). Prepared by Kimley-Horn. Owners listed as Kairoi Properties, LLC and Belmar Owner, LLC. 46 pages. February 26, 2025.

In this letter I offer comments primarily on stormwater management and snow/ice management. In brief, my background relevant to the topics on which I am offering comments includes the following:

- Undergraduate Civil Engineering studies (B.C.E from University of Minnesota)
- Graduate Civil Engineering studies focusing on water resources (Master of Science and Doctor of Science from Massachusetts Institute of Technology)
- Over 40 years professional experience in water resources and environmental quality management
- Teaching graduate and undergraduate level course in hydrology, hydraulics, chemical fate and transport, and environmental quality management at Northeastern University and the Massachusetts Institute of Technology
- Registration as a Professional Engineer in Massachusetts, Maine (retired), and Alabama (retired)
- Board certification as a Diplomate in Water Resource Engineering by the American Academy of Water Resources Engineers (retired)
- Over 30 years as a member and vice-chair of the Lexington Massachusetts Conservation Commission, a body that implemented the Massachusetts Wetlands Protection Act and associated Lexington By-Laws through issuance of permits

that conditioned projects as appropriate to comply with associated rules, including stormwater management. The Conservation Commission was also responsible for managing over 1000 acres of Town owned conservation lands.

Stormwater Management

The general approach to stormwater management proposed for the proposed development appears to consist of the following key elements:

- The project site under proposed conditions has been divided into 17 sub-basins for stormwater drainage management (FDR pp. 6-8).
- Storm inlets (aka catch basins and roof drains) that capture water runoff from these 17 sub-basins are distributed throughout the development at both ground level (MSP p. 3) and on the roof (FDR p. 6).
- Piping conveys water from 13 of the 17 sub-basins (total of 4.66 acres) to a water quality and detention vault (MSP p. 3, FDR pp. 6-9).
- Sub-basins OS-1 (0.11 acres), OS-2 (0.20 acres), OS-3 (0.08 acres), and OS-4 (0.08 acres) do not drain to the detention vault.
- The detention vault has an outlet configuration designed to restrict outflow rates to less than or equal to those allowed by City of Lakewood criteria. (FDR pp. 9, 10).
- The detention vault is designed to provide at least 40 hours of retention for the required Water Quality Capture Volume to allow solids to settle and be captured in the vault (FDR p. 9, 10).
- Water discharged from the detention vault flows in a pipe to an outfall at the outfall from Kountze Lake, flowing from there to Weir Gulch (MSP p. 3, ESCR p. 216, FDR pp. 6, 11).
- An emergency outlet from the detention vault at design point S-1 flows overland to Kountze Lake through an existing overland drainage pathway (FDR pp. 7, 11; Drawing C6.1).
- Emergency overflows from storm inlets interior to the project that cannot be conveyed to the detention vault will overtop the curb on the drive west of the courtyards and flow toward Kountze Lake (FDR p. 11).
- A maintenance plan for the detention vault is described on FDR p. 12.

The FDR p. 7 states the following:

This Project will comply with the current City of Lakewood adopted "Storm Drainage Manual," dated August 9, 1982 (the Criteria) and the "Urban Drainage and Flood Control district Urban Storm Drainage

Criteria Manual" Volumes 1, 2, and 3 (the Manual), with latest revisions.

FDR p. 12 then states the following:

The 777 S. Yarrow St. Multifamily project is in compliance with the City of Lakewood "Storm Drainage Criteria Manual" and the "Urban Drainage and Flood Control district Urban Storm Drainage Criteria Manual" Volumes 1, 2, and 3. The water quality, detention vaults, and storm sewer system have been designed to prevent any negative impacts to the adjacent sites during the 100-year event.

I have not reviewed the engineering hydraulics and hydrology calculations and thus do not offer comments on their accuracy. I note that the Lakewood Engineering department has reviewed the calculations and raised various questions in the redline markup. My expectation is that the applicant's engineering team will work with the Lakewood Engineering department to resolve any issues related to the design calculations. I thus expect that the final design will indeed comply with the applicable quantitative criteria related to managing impacts to adjacent sites, and to managing storm water quality.

The proposed system for storm water management does not, however, address the less quantitative criteria found in the Lakewood zoning rules or the Urban Storm Drainage Criteria Manual[1]. My specific comments include the following.

Lakewood Zoning Section 17.7.5: Open Space and On-site Amenities

Section 17.7.5.1: General Standards, part C. states the following: "Stormwater detention areas should be integrated into the site design and used as an amenity to the greatest extent possible." This zoning rule reflects the concept that stormwater can and should be used beneficially, as an amenity, and suggests one specific form of water amenity, related to stormwater detention.

Mile High Flood District Urban Storm Drainage Manual

Volume 1, Section 1.1, Item 6 states the following:

[1] The Mile High Flood District Urban Storm Drainage Manual https://www.mhfd.org/criteria-manual Accessed May 5, 2025.

An urban storm drainage strategy should be a multi-objective and multi-means effort. The many competing demands placed on space and resources within an urban region argue for a drainage management strategy that meets a number of objectives, including water quality enhancement, groundwater recharge, recreation, wildlife habitat, wetland creation, protection of landmarks/amenities, control of erosion and sediment deposition, and creation of open spaces.

In essence this statement is promoting beneficial use of stormwater, not just control of off-site impacts.

This statement regarding the desirability of addressing multiple objectives in an urban drainage system is consistent with the concept of developing an improved sense of land ethics, as described by the seminal writer on environmental conservation, Aldo Leopold. As stated by Leopold in his classic work "A Sand County Almanac," a key concept is to "Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient." Applied to this situation, managing the stormwater in a manner that avoids adverse impacts to other properties is a bare minimum obligation of the property owner. Consideration of what is ethically right demands more.

Thus, both the Lakewood zoning rules and the Mile High Flood Control District guidance promote beneficial stormwater use, beyond the basic requirements to control off-property impacts.

Stormwater Management Improvement Opportunities

The proposed project does not make any apparent attempt to use stormwater beneficially, but rather simply mitigates off-property impacts, a minimal approach to managing stormwater. Regarding the specific form of water amenity described in the Lakewood zoning rule, the proposed project hides the stormwater detention facility in an underground vault. The reasons for using this approach are not discussed in any of the documents I reviewed but are apparent from the character of the proposal. Putting the stormwater detention into an underground vault allows the area over the vault to be developed, increasing the site development density. It would be quite feasible to use stormwater as an onsite amenity if the development density for the property were reduced, but the proposed development intensity prevents use of a stormwater detention basin exposed on the ground surface.

The applicant should be challenged to think of ways to make beneficial use of stormwater and incorporate them into the project proposal. Neither the extreme development intensity nor the proximity to the public water amenity created by Kountze Lake and

Belmar Park should be used as a reason to avoid using stormwater from the project site beneficially in some fashion. Obvious potential options include routing the detention vault outflow through Kountze Lake, recharging ground water, and landscape watering. The applicant's design team and Lakewood staff may have additional ideas.

The proposed project is a large intense development in a sensitive area, adjacent to the public amenities of Belmar Park and Kountze Lake. It will be a long time, probably at least 50 years, before this site is again subject to redevelopment. If redevelopment of this site is allowed to proceed, now is the time to incorporate modern concepts of beneficial stormwater use, rather than settling for just mitigating off-property impacts.

Stormwater system maintenance:

The applicant has proposed various physical features of the stormwater management system to facility maintenance and inspection, as required by the City of Lakewood, CO, and proposed a maintenance plan (FDR pp. 11-12). The plan itself seems reasonable, but should be supplemented as follows:

- The applicant should prepare drainage system inspection forms that include checklists for key items and space for narrative comments on issues that may be noted during the inspections. Such inspection forms will preferably be in electronic form, for use on devices such as electronic tablets.
- The inspection reports should be filed with the City of Lakewood and be readily available for public review using commonly available software. An example of commonly available software would be forms that can be viewed using Adobe PDF® reader software.

Snow and ice management:

The snow storage areas indicated on p. 2 of the MSP include an area in the northwest corner of the development and the statement in Note 6 that snow will be stored in the southwest corner of the development. Best practices for snow storage includes provisions for melting snow to drain through water quality control facilities and minimizing impacts on landscape plants, among other matters, as described on pages 98-101 of the ESCR. The snow and ice management practices proposed for the 777 S. Yarrow St. development do not, however, appear to adopt the good practices described in the ESCR. Neither of the proposed snow storage areas drain through water quality management facilities and the snow storage area in the northwest corner of the property is likely to impact landscape vegetation shown on p. 7 of the MSP. Further, the snow storage area indicated in the northwest corner of the development is on a very steep slope (approximately 15%, as labeled on p. 2 of the MSP), is likely to create off-property

impacts. I was also unable to find a discussion of chemical or sand use for ice control in the documents I reviewed.

The applicant should be required to prepare a snow management plan that adopts the good management practices described in the ESCR document and that avoids off-property impacts.

Other comments:

The MSP page 39 provides plans for a parking garage. The project descriptions on p. 8 of the ESCR and p. 3 of the FDR do not, however, list a garage as being among the project elements. This should be clarified. If a garage is included, drainage plans for the garage should be specified.

The MSP p. 2 shows off-property grading west of the property line in the northern portion of the project. I did not find any discussion of whether that grading has been approved by the adjacent property owner, shown as the City of Lakewood.

Closing

I appreciate the opportunity to offer these comments on the development project proposed for 777 S. Yarrow St., Lakewood, Colorado and hope they may be of some value as the Lakewood Planning Commission evaluates the proposed development.

By way of disclosure, I have not been, nor do I expect to be, compensated for my efforts in preparing these comments. I have prepared them as volunteer support to Save Belmar Park, Inc.

Respectfully submitted,

DE Langseth