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March 2, 2018

Mr. Chad Gilpin
City of Dripping Springs, City Engineer
PO Box 384
Dripping Springs, Texas 78620
Via email: cgilpin@cityofdrippingsprings.com

Subject: Civil Site Development Plans for Mark Black Wedding Venue

Dear Mr. Gilpin:

This letter constitutes an update to my letter to you on February 17, 2108 on the failure of the Mark Black Wedding Venue Civil Site Development Plans to meet the City of Dripping Springs ordinance standards and protect the uniquely sensitive and pristine land, creeks, springs, and environment within its jurisdiction. In preparing the opinions herein, I have reviewed the following supplemental documents:

- Letter to City of Dripping Springs Development Services Department from Andrew Evans, P.E., Kimley-Horn and Associates, Inc. sealed on February 27, 2018;
- Letter report from C. Joel Sprague, P.E., TRI/Environmental, Inc. regarding Large-Scale Sediment Retention Device Testing of FLEXSTORM PC/PC+ Inlet Filters for Total Petroleum Hydrocarbons (TPH) Removal at Various Flow Rates, November 30, 2009;
- Letter to BaySaver Technologies LLC from Susan M. Jablonski, P.E., the Texas Commission on Environmental Quality regarding Edwards Aquifer Protection Program – Innovative Technology, August 4, 2017;
- Technical Evaluation Report: BayFilter™ EMC System, Woodinville Sammamish River Outfall, Woodinville, Washington, by BaySaver Technologies, LLC, June 6, 2016;
- An untitled and unidentified document contained in this file: TGM ADDENDUM BayFilter 08032017;

- Civil Site Development Plans for Mark Black Wedding Venue sealed by Andrew S. Evans on February 26, 2018; and
- A letter from Chad Gilpin, P.E., on behalf of the City of Dripping Springs, to Andrew Evans, P.E., Kimley Horn & Associates, regarding SD2017-005 Mark Black Wedding Venue – CODS Review Comments.

The information presented in these plans, combined with information that I reviewed for my letter to you on February 17, 2018, indicate that the proposed project will not achieve the minimum requirements established by the City of Dripping Springs for these reasons:

1. The proposed vegetative filter sizes are too small compared to sizes required by the City of Austin Environmental Criteria Manual, based on the size and impervious area of each of their contributing areas. Therefore pollutant removal efficiencies in the City of Austin Environmental Criteria Manual cannot be used.
2. LCRA limits the maximum contributing area for stand-alone vegetative filter strips to 3 acres. Contributing areas for N VFS 1 AND N VFS3, however, are 5.62 and 6.96 acres, respectively. Because their contributing areas are too large, LCRA assumptions regarding their effectiveness cannot be used to calculate pollution removal for these areas.
3. TSS, TP, and O&G removal calculations on Sheet 38 of the Civil Site Plans include removal efficiencies for rainwater harvesting. The applicant has not, however, specified the size of rainwater cisterns and therefore cannot take credit for any pollution removal.
4. By failing to consider relationships among the BayFilter system size and the size and imperviousness of the contributing area, the application continues to overestimate the effectiveness of these proposed systems to remove pollution.
5. In consideration of these factors, my calculations indicate that the applicant fails to achieve the required 90% reduction in the estimated increase in total

suspended solids and total phosphorus. The estimated phosphorus removal is less than half what would be required by City of Dripping Springs standards.

I have these additional critiques of the information that has been submitted by the applicant:

- TGM ADDENDUM BayFilter 08032017.pdf, on page 1, recommends the BayFilter system be located downstream from extended detention. The applicant has not proposed to do that and any removal efficiencies in this document are, therefore, not relevant to this submittal.
- TGM ADDENDUM BayFilter 08032017.pdf, on page 3 states that the BayFilter system is not suitable for stream erosion control and recommends an offline installation with an external bypass to route high intensity storms away from the system and prevent sediment resuspension. The applicant has not proposed that the systems be installed with bypass technology. Any information in this document regarding effectiveness of the BayFilter systems for pollution removal are, therefore, not relevant to the proposed project.
- TER Woodinville BayFilter August 2016.pdf presents data based on monitoring in Western Washington. The tested rainfall depths ranged from 0.2 to 0.68 inches. These rainfall depths are not comparable to the rain events that are typical of Central Texas Hill Country, and the proposed application of this system. Conclusions in this document regarding pollution removal efficiency for the BayFilter system will over-estimate its effectiveness in the proposed application.
- The research in TER Woodinville BayFilter August 2016.pdf rejected any events with a removal rate less than 50% for total phosphorus, thereby biasing the results toward higher removal efficiencies. Conclusions in this document regarding pollution removal efficiency for total phosphorus for the BayFilter system may over-estimate its effectiveness in the proposed application.

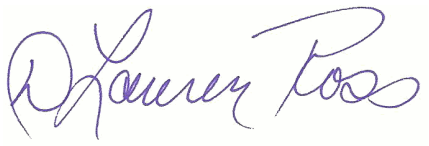
- TER Woodinville BayFilter August 2016.pdf states that two factors determine the effectiveness of the BayFilter system: maximum flow rate and anticipated sediment load. The applicant has not evaluated either of these factors in their estimate of system effectiveness.
- Regarding the demonstration that there will be no increase in peak stormwater flow rates from the site with the proposed development, the applicant states in the comment response letter: *"The predeveloped curve number for the bare soil is 89 based on TR-55 Table 2-2d (Pinyon-juniper, Poor Condition), Type D Soil)".* There are a couple of problems with the foundations of this statement. First, the applicant is cherry-picking soil characteristics. For the purposes of peak flow estimation, they assume the entire site is characterized by Hydrologic Soil Group D. For water quality control design, they assume the entire site is characterized by Hydrologic Soil Group C. Neither is true and the site contains soils in both the "C" and "D" groups. The second problem is the assumption that the existing conditions are "poor". "Poor" conditions are described[1] as "<50% ground cover or heavily grazed with no mulch." The photographs on 07 17 Prelim Drainage Study.pdf show that the ground is well covered with either grass or mulch. See also photographs here: http://tours.tourfactory.com/tours/tour.asp?t=1455499&idx=1. An appropriate curve number, based on the photographs, would be 65 (brush, good conditions, hydrologic soil group C) to 80 (pinyon-juniper, fair, hydrologic soil group D). A hydrologic analysis based on accurate representation of the apparent existing conditions will demonstrate peak flow rate increases between existing and proposed conditions.

[1] TR-55, Table 2-2C, page 2-7.

- FLEXSTORM_PC_TPH_Removal_3rd_Party.pdf is presumably provided to demonstrate assumed oil and grease removal efficiencies. The research reported here is not demonstrably relevant to BayFilters. Furthermore, the oil concentration of 243 mg/L used in the research is much higher than those typical of parking or driving areas (4.13 mg/l (residential area) to 15.25 mg/l (parking lot)[2]; 1.2 mg/l)[3]. This report is irrelevant and misleading with respect to the stormwater controls proposed for this project.

Please let me know if I can answer any questions.

Sincerely,



Lauren Ross, Ph. D., P. E.
President
Glenrose Engineering, Inc.

Sealed on March 2, 2018

[2] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.707.1687&rep=rep1&type=pdf.

[3] Barrett et. al, Water Quality and Quantity Impacts of Highway Construction and Operation: Summary and Conclusions, CRWR 266, Center for Research in Water Resources, University of Texas at Austin, November 1995

Photographs Demonstrating Existing Vegetation on the Proposed Mark Black Wedding Venue Site

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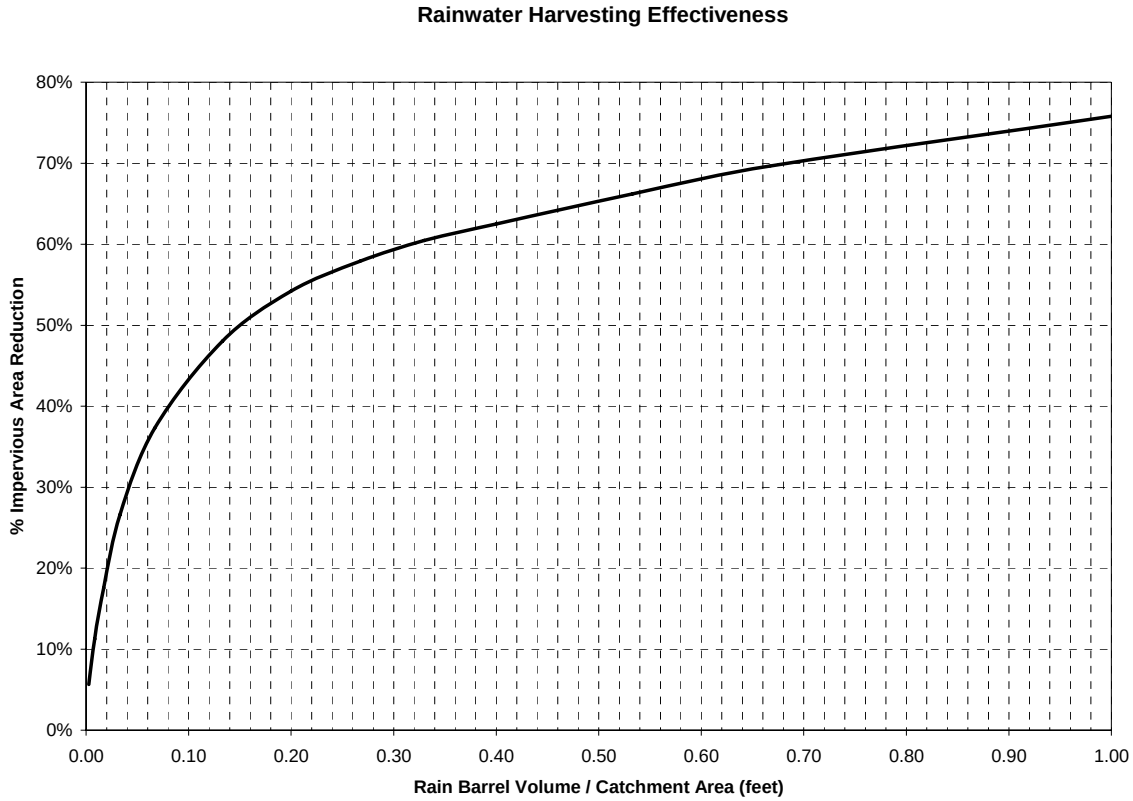

Figure 2-1 Rainwater Collection Credit

Soil Amendment refers to the placement of native or blended soils to a depth of six (6) to eight (8) inches to support appropriate turf grasses and landscaping. The soil amendment is applied to all lots within the development. Reduced impervious cover credit is computed by Equation 2.4.

Equation 2.4 $\mathbf{A_r = A_D * 0.02}$

Where: A_r = Allowable reduction in impervious cover

A_D = Area of development

Conservation Landscaping refers to the use of limited turf area, preservation of natural vegetation, and the planting of native trees, shrubs, and perennials to infiltrate stormwater runoff and minimize chemical use. The conservation landscaping is applied to all lots within the development. Reduced impervious cover credit is computed by Equation 2.4.1.