July 10, 2019

Andre' Brooks, PE
President
ABE Associates, Inc.
440 Burroughs Street, Suite 605
Detroit, Michigan 48202

RE: Public Comment - Solution for Volume Credit Equation

Dear Mr. Brooks,

Please accept this letter as a follow-up to your concerns addressed to the Detroit Water and Sewerage Department (DWSD) at a previous community outreach meeting. In your comment, you posed several questions regarding the Total Average Annual Runoff Volume and calculation of the Volume Credit.

Previously, a technical memorandum dated 3/1/2019 was provided to you, which describes in detail how to determine the runoff volume and volume retained on an annual basis, along with examples. It appears that most of your questions' answers are available in the 3/1/2019-Memo and the Drainage Program Guide posted on the DWSD website at: www.detroitmi.gov/drainage.

Question 1. What is the solution for the Volume Credit Equation?

> *DWSD Response – The 3/1/2019-Memo describes how to determine the runoff volume and the volume retained on an annual basis. As described in the memo, the Percent Volume Credit is calculated based off a long series of individual rain events or historical rainfall records. Two approaches were provided to determine these values. One requires a long series of individual rain events (minimum of 10 years data required). The other is a simplified approach, which uses a regression equation based off historical rainfall records to calculate the Average Annual Percent Volume Retained* $(Average\ Annual\ Percent\ Volume\ Retained\ (\%) = 1 - 2.5^{-2.5 \times Runoff\ Retained})$ *– this equation is provided in the Drainage Program Guide. The regression equation is the preferred approach for simplicity and consistency reasons. Please see the memo for more information.*

Question 2. There are no sample problems in the manual that illustrate how to solve the Volume Credit Equation, please provide the solution.

> *DWSD Response - The Drainage Program Guide has several examples to calculate the Volume Credit in the chapter titled "Credits for Commonly Used Stormwater Management Practices". The 3/1/2019-Memo also provides details on how to solve the Volume Credit Equation.*

Question 3. What is the Design Storm Value of the denominator in this equation, in terms of 1 Year Storm, 2 Year Storm or 5 Year Storm and the Duration (i.e. 24 Hours)?

> *DWSD Response - Volume credits are calculated relative to the Total Average Annual Runoff Volume. Examples of Volume Credit calculations are provided in "Section 3.0 Examples" of the 3/1/2019-Memo.*

Question 4. What is the representative Design Storm Value of the denominator in inches for item No. 3 above?

> *DWSD Response - Please see the response to Question 3.*

Question 5. A definition of the term Total Average Annual Runoff Volume was not provided in the manual, please provide the definition of this term.

> *DWSD Response - The Total Average Annual Runoff Volume is the total average runoff volume generated from a defined tributary area in a year. The Total Average Annual Runoff Volume was described in detail in the 3/1/2019-Memo.*

For more information on the design of stormwater management practices, you are advised to refer to the City of Detroit Stormwater Management Design Manual that is available to download from www.detroitmi.gov/dwsd or other professional literature, such as the SEMCOG LID Manual.

Your concerns regarding the Peak Flow Credit Equation and the 100-year, 24-hour storm were already addressed in previous communication.

If you have further questions, you can contact our customer care center at 313-267-8000 option 6 to speak with a representative.

Respectfully,

Lisa Wallick

Lisa Wallick, P.E.
Stormwater Management Group (SMG) Manager

cc: Honorable Board of Water Commissioners
        Nikkiya Branch, Esq.
        Syed Ali