



WATER RESOURCES/WATER SERVICES **FREQUENCY ANALYSIS PROCEDURES**

This bulletin is issued to provide clarity to both the development community and City of Calgary staff as to the proper procedures to be followed when conducting frequency analysis for sizing stormwater infrastructure within The City of Calgary.

These procedures complement Section 3.2.6 “Statistical Analysis” in the 2011 Stormwater Management & Design Manual. The “*Frequency Analysis Procedures for Stormwater Design Manual*” and associated “*Frequency Analysis Procedures Spreadsheet*” are intended as a practical guide for the practicing engineer. They address the review and analysis of datasets and how the most suitable probability distribution should be selected. The manual also documents best professional practice and provides worked examples of data analysis procedures for both independent data series (e.g., storm ponds that drain in a few days) and dependent data series (e.g., zero-discharge / evaporation ponds). The manual and spreadsheet are available at the Water Resources - Development Approvals’ website, see <http://www.calgary.ca/UEP/Water/Pages/Specifications/Submission-for-approval-/Development-Approvals-Submissions.aspx>.

The spreadsheet complements typical, commercially available frequency analysis software packages that generate a variety of probability distributions for the datasets of interest. As the numerical tool with the most complete toolset for generating probability distributions, HYFRAN+ is recommended. Other commercially available packages can be employed; however, at a minimum, the following probability distributions shall be analyzed:

Normal	Lognormal
Lognormal III	Exponential
Pearson III	Log Pearson III
Gumbel	GEV
Weibull	Gamma

These procedures are effective as of May 1st, 2014, for all reports being submitted to Water Resources. As part of the next update Stormwater Management & Design Manual, Section 3.2.6 will be updated to reflect the recommendations contained in the “*Frequency Analysis Procedures for Stormwater Design Manual*”.

For questions related to the above, please contact Bert van Duin, Senior Development Engineer at (403) 268-6449 or at bert.vanduin@calgary.ca.