



Stantec Consulting Services Inc.
2250 Douglas Boulevard, Suite 260
Roseville CA 95661-4207

February 29, 2024

Project/File: 184031535

Somporn Boonsalat
1001 W. Center St. Manteca, CA 95337

Dear Somporn Boonsalat,

Reference: Wastewater Peaking Factor

Stantec reviewed the wastewater flow data collected for use in the development of a hydraulic model of the City's existing wastewater collection system. This hydraulic model was used to evaluate the existing and future wastewater collection system needs identified in the City's Wastewater Master Plan (February 2024). The flow data and model results were used to develop a peaking factor equation for use in the City's Design Standards.

The existing City Standards provide design flow calculations for collection system facilities. The design standards do not address flow modeling methodologies and assumptions related to the simulation of peak wet weather flow (PWWF) in the collection system. After establishing average dry weather flow (ADWF) conditions based on existing flow monitoring data and projecting future conditions with wastewater generation factors, the hydraulic model is used to apply a diurnal flow pattern to the ADWF and then the infiltration/inflow (I/I) resulting from a simulated severe storm event is superimposed on the dry weather flow pattern.

The 2012 Wastewater Collection System Master Plan (NV5, 2013) estimated peak flows based on an empirical equation instead of the use of a hydraulic model as described above. The original equation from the 2012 Master Plan is shown below, where ADWF is in million gallons per day (MGD).

$$PF = 2e^{(-2xADWF)} + 2.05$$

To update the equation, flow monitoring data and the results of the hydraulic model within the future collection system were plotted against the original equation and the equation was adjusted until it sufficiently matched model results. The resulting equation is shown below.

$$PF = 3e^{(-2xADWF)} + 3.00$$


Reference: Wastewater Peaking Factor

Table 1. Recommended Peaking Factors

ADWF (MGD)	PF	PWWF (MGD)
0.00	6.00	0.00
0.05	5.71	0.29
0.10	5.46	0.55
0.25	4.82	1.20
0.50	4.10	2.05
0.75	3.67	2.75
1.00	3.41	3.41
2.00	3.05	6.11
4.00	3.00	12.00

Thanks,

STANTEC CONSULTING SERVICES INC.



Steve L. Beck PE
Project Manager
Phone: 916-826-3665
steve.beck@stantec.com