MATHEMATICAL MODELLING OF WASTEWATER COLLECTION SYSTEM IN CHA-AM MUNICIPALITY BY USING PCSWMM

THAW TAR HTUN

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THAW TAR HTUN 5738639 EGEW/M

M.Eng. (ENVIRONMENTAL AND WATER RESOURCES ENGINEERING)

THESIS ADVISORY COMMITTEE: RANJNA JINDAL, D.Tech.Sc, KIMBERLEY IRVINE, Ph.D.

ABSTRACT

This study aimed at modelling the wastewater collection system in Cha-Am Municipality using PCSWMM to investigate the quantity of combined sewage delivered to the aeration lagoon treatment system (ALTS) as well as to determine whether or not the capacity of the current collection system would be sufficient to convey peak flow under different land use and development scenarios in Cha-am in near future. Cha-Am is a small sea resort town in Petchaburi Province located about 175 km southwest of Bangkok and is facing increasing development so it is important to understand current system performance and plan for future build out. PCSWMM was calibrated using observed ALTS inflow data for the period 15 June to 20 July 2015. The model was validated using observed ALTS inflow data for the periods 19 July to 20 October 2015. The 1:1 lines between modeled and observed peak flow and event volume for the calibration events qualitatively showed good correspondence. The r2 values between modeled and observed peak flow (99%) and event volume (89%) also were strong. The calibrated model was used to examine the quantity of wastewater discharged by the community under the proposed future development scenario in Cha-Am. Based on the model results, the quantity of wastewater discharged by proposed development area combined with old wastewater collection system did not exceed the capacity of the treatment plant.

KEY WORDS: COMBINED SEWER SYSTEM / MATHEMATICAL MODELLING / PCSWMM / WASTEWATER COLLECTION SYSTEM/

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