

Supplementary Material

A Process Model for Leachate Treatment in Adsorbent-Amended Constructed Wetlands

Ishfaqun Nisa¹ , Mauricio E. Arias¹ , Lillian Mulligan¹ , Xia Yang^{1,2} , Sarina J. Ergas¹ 

¹Department of Civil and Environmental Engineering, University of South Florida, Tampa, Florida, USA

²Department of Civil and Environmental Engineering, University of Houston, Houston, Texas, USA

Correspondence

Mauricio E. Arias

Department of Civil and Environmental Engineering

University of South Florida

Tampa, FL 33620, USA

Email: mearias@usf.edu

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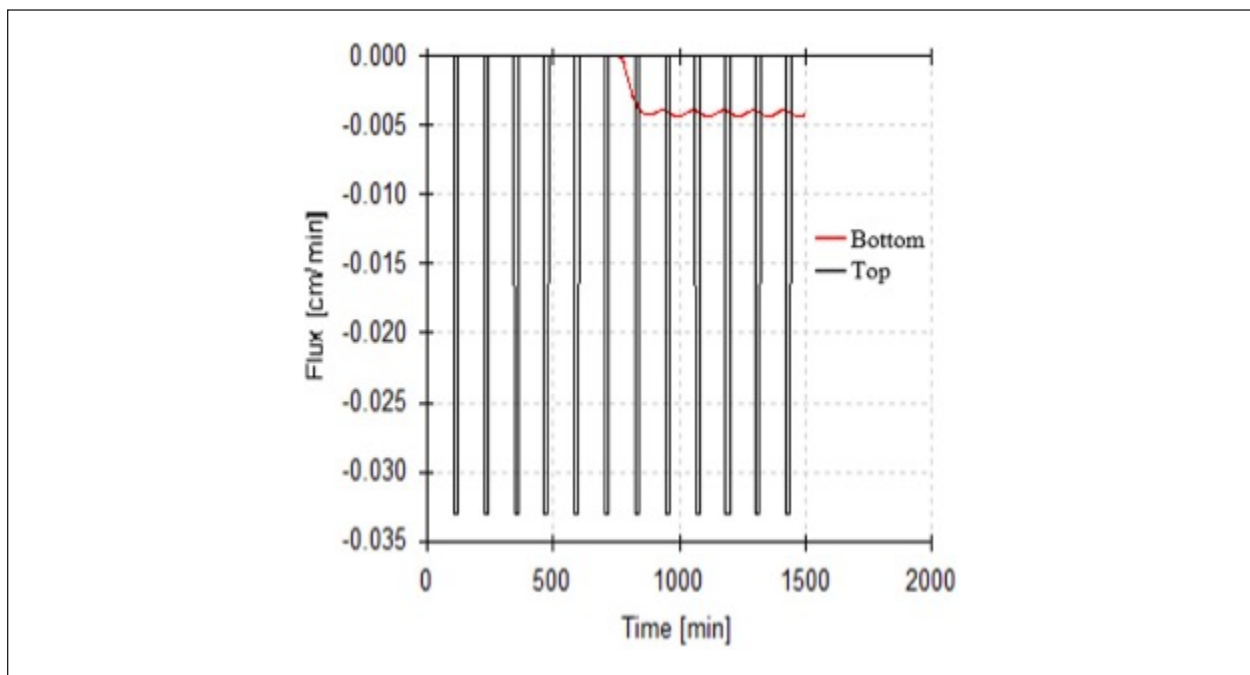


Fig. S1 Hydraulic Simulation Results for VF-CW.

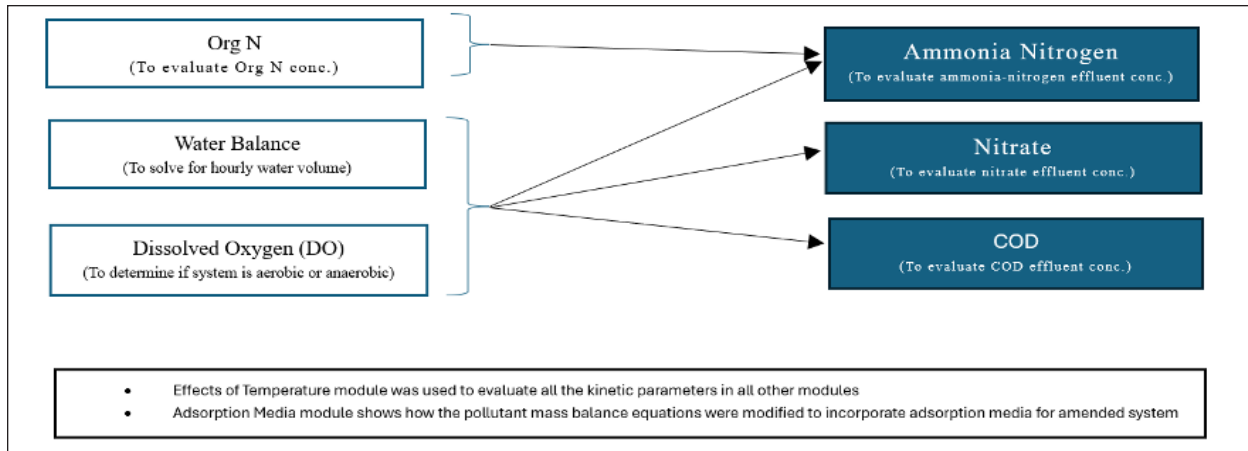


Fig. S2 Overview of Module interactions.

Table S1 Van Genuchten parameters for hydraulic simulation

Soil Layer	θ_r	θ_s	α (1/cm)	n	Ks (cm/day)	I
Main/Coarse Gravel	0.005	0.42	0.493	2.19	302400	0.5
Fine Gravel	0.03	0.33	0.007	2.96	28512	0.5

Table S2 Calibrated values for adsorbent-amended CW model parameters

Parameter	Unit	Calibrated Value VF-CW	Calibrated Value HF-CW	Literature Range	Reference
μ_{max}	mg/L/h	67.04	41.25	-	
k_b	mg/L/h	868	1600	-	
k_m	/h	0.6	0.12	0.0004 – 0.002	Alvarez and Becares (2008)
k_n	/h	0.09	0.009	6 – 39	Lahav and Green (2000)
k_{dn}	/h	0.035	0.1	-	
k_{pd}	/h	0.005	0.008	0.0014 – 0.0052	Martin and Reddy (1997)
$q_{NH_4^+}$	mg/g	2	0.05	-	
q_{COD}	mg/g	0.29	12	-	
$D_{s,zeolite}$	m ² /s	$4.77 \cdot 10^{-12}$	-	$6.82 \cdot 10^{-12}$ – $4.2 \cdot 10^{-11}$	Welander et al. (1997)
$D_{s,biochar}$	m ² /s	-	$3.37 \cdot 10^{-11}$	-	

Table S3 Calibrated values for unamended CW model parameters

Parameter	Unit	Calibrated Value VF-CW	Calibrated Value HF-CW	Literature Range	Reference
μ_{max}	mg/L/h	67.04	41.25	-	
k_b	mg/L/h	868	1177	-	
k_m	/h	0.6	0.12	0.0004 – 0.002	Alvarez and Becares (2008)
k_n	/h	0.7	0.006	6 – 39	Lahav and Green (2000)
k_{dn}	/h	0.035	0.1	-	
$k_{pu,nitrate}$	/h	0.03	0.4	-	Martin and Reddy (1997)
k_{pd}	/h	0.005	0.008	0.0014 – 0.0052	
$k_{pu,ammonia}$	/h	0.002	0.003	-	

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