

# **15th International Conference on Environmental Engineering**

Held as Part of the Canadian Society for Civil Engineering  
Annual Conference and General Meeting 2017

ISBN: 978-1-5108-7839-6

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2017) by Canadian Society for Civil Engineering  
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact Canadian Society for Civil Engineering  
at the address below.

Canadian Society for Civil Engineering  
521-300 rue St-Sacrement  
Montréal, QC  
H2Y 1x4

Phone: (514) 933-2634  
Fax: (514) 933-3504

info@csce.ca

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: curran@proceedings.com  
Web: www.proceedings.com

# TABLE OF CONTENTS

<b>A REVIEW OF HISTORICAL EXTREME WIND SPEEDS IN A CHANGING CLIMATE AT SOME MAJOR CANADIAN CITIES</b> .....	1
<i>Sihan Li, Peter Irwin, Mike Gibbons, Valerie Sifton , John Kilpatrick</i>	
<b>ADVANCED OXIDATIVE PROCESSES FOR DEGRADATION OF CARBAMAZEPINE IN WASTEWATER EFFLUENTS</b> .....	11
<i>Purnima Somathilake, John Albino Dominic, Gopal Achari, Cooper H. Langford, Joo-Hwa Tay</i>	
<b>AKLAVIK, NWT - SOLID WASTE PLANNING STUDY</b> .....	17
<i>Kenneth Johnson, Jamie Davignon, Fred Behrens</i>	
<b>AN EVALUATION MODEL FOR DEMOLITION WASTE IN THE RESIDENTIAL CONTEXT</b> .....	26
<i>Azzeddine Oudjehane, Christopher Raghubar</i>	
<b>AN INNOVATIVE APPROACH TO TREAT AMMONIA-RICH WASTEWATER BY PARTIAL NITRIFICATION/ANAMMOX IN BIOCAST REACTOR</b> .....	36
<i>Nayereh Saborimanesh, Catherine Mulligan, David Walsh, Laleh Yerushalmi, Esteban Castillo Arriagada</i>	
<b>ANAEROBIC SULFATE REDUCTION AND METAL PRECIPITATION IN UPFLOW HYBRID REACTOR: COMPARISON OF SINGLE AND TWO STAGE PROCESSES</b> .....	46
<i>Shahrokh Shahsavari, Rajesh Seth, Nihar Biswas</i>	
<b>APPLICATION OF ELECTRO-OXIDATION FOR NAPHTHENIC ACIDS (NAS) DEGRADATION</b> .....	48
<i>Abdallatif Abdalrhman, Mohamed Gamal El-Din</i>	
<b>ASSESSMENT OF MICROBIAL DENITRIFYING CAPACITY IN VEGETATED BIOREACTORS TREATING GREENHOUSE EFFLUENT</b> .....	51
<i>Soheil Fatehi Pouladi, Bruce Anderson, Brent Wootton, Lloyd Rozema, Kela Weber, Sonja Bissegger</i>	
<b>ASSESSMENT THE PRESENCE OF HEAVY METAL (HM) CONCENTRATION IN RIVER WATER AND FISH SPECIES AND ASSOCIATED HUMAN HEALTH HAZARD DUE TO THE FISH CONSUMPTION OF TURAG RIVER IN BANGLADESH</b> .....	61
<i>Sk Abdur Rashid, Afia Siddika, Tauhidur Rahman</i>	
<b>BIOMASS WASTE-DERIVED ADSORBENTS FOR THE REMOVAL OF ORGANIC POLLUTANTS FROM WATER</b> .....	71
<i>Chunjiang An, Gordon Huang, Xiujuan Chen, Jian Shen, Yarong Shi</i>	
<b>BIOTRANSFORMATION OF AROMATIC COMPOUNDS IN OIL SANDS PROCESS-AFFECTED WATER BY PSEUDOMONADS</b> .....	73
<i>Yanyan Zhang, Jinkai Xue, Mohamed Gamal El-Din</i>	
<b>CIGARETTE BUTT WASTE MANAGEMENT AND SMOKING POLICY ON CAMPUS</b> .....	76
<i>Kelvin T. W. Ng, Amy Richter</i>	
<b>CO-COMBUSTION OF MUNICIPAL SEWAGE SLUDGE WITH CASTER SEED SHELL IN BUBBLING FLUIDIZED BED COMBUSTOR UNDER OXYGEN-ENRICHED CONDITION: EXPERIMENTAL INVESTIGATION</b> .....	87
<i>Ravi Inder Singh Jassar, Rajesh Kumar</i>	
<b>COMPARISON OF NITRILOTRIACETIC ACID AND [S,S]-ETHYLENEDIAMINE-N,N-DISUCCINIC ACID IN UV-FENTON FOR THE TREATMENT OF OIL SANDS PROCESS-AFFECTED WATER AT NATURAL PH</b> .....	95
<i>Ying Zhang, Nikolaus Klamerth, Pamela Chelme-Ayala, Mohamed Gamal El-Din</i>	
<b>COMPARISON OF UV/HYDROGEN PEROXIDE, FERRATE(VI), AND OZONE IN OXIDIZING OIL SANDS PROCESS-AFFECTED WATER (OSPW)</b> .....	98
<i>Chengjin Wang, Nikolaus Klamerth, Selamawit Ashagre Messele, Arvinder Singh, Mike Belosevic, Mohamed Gamal El-Din</i>	
<b>COST FOCUSED EVALUATION OF ADVANCED OXIDATION PROCESSES TO REMOVE VENLAFAXINE IN WASTEWATER</b> .....	100
<i>Jordan Hollman, John Albino Dominic, Gopal Achari, Cooper H. Langford, Joo-Hwa Tay</i>	
<b>CROSS-CORRELATING LANDFILL GAS QUALITY WITH CLIMATIC FACTORS AT THE CITY OF REGINA LANDFILL</b> .....	110
<i>Amy Richter, Kelvin T. W. Ng</i>	
<b>DESIGN AND OPERATION OF ACTIVELY-AERATED FIELD-SCALE METHANE BIOFILTERS</b> .....	120
<i>Samadhi Gunasekera, Patrick Hettiaratchi, Eranda Bartholameuz, Eamonn Irvine</i>	
<b>DESIGN WASTE GENERATORS IN CONSTRUCTION PROJECTS</b> .....	130
<i>Mohamed Osmani</i>	

<b>DIFFERENT ELECTRICAL REGIMES TO DEMULSIFY OIL SLUDGE - WETTABILITY INDICATOR.....</b>	139
<i>Esmael Kariminezhad, Maria Elektorowicz</i>	
<b>EFFECT OF A NOVEL BIOCHAR SUPPORTED NANOSCALE IRON SULFIDE COMPOSITE ON CORYNEBACTERIUM VARIABLE HRJ4 AND A CHEM-BIO HYBRID PROCESS FOR TRICHLOROETHYLENE DEGRADATION .....</b>	146
<i>Honghong Lyu, Hang Zhao, Catherine Mulligan, Jingchun Tang</i>	
<b>ENHANCED ELECTROCHEMICAL AND BIOLOGICAL PHOSPHORUS REMOVAL IN A SOLE REACTOR.....</b>	148
<i>Adam Abdelmajeed, Maria Elektorowicz, Ibeid Sharif</i>	
<b>ENHANCEMENT OF PRIMARY TREATMENT OF COMBINED SEWER OVERFLOW (CSO) BY USING FERRATE (VI) .....</b>	159
<i>Abdulrahim Alumaïri, Mohamed Gamal El-Din, Abdul Mohammed</i>	
<b>EVALUATION OF ELECTROCOAGULATION AS A METHOD OF PRE-TREATMENT FOR HIGHLY CONCENTRATED BREWERY WASTEWATER .....</b>	162
<i>Nawrin Anwar, Sharmin Sultana, Saifur Rahaman, Oluchi Okoro</i>	
<b>EVAPOTRANSPIRATION LANDFILL BIOCOVER TO CONTROL ATMOSPHERIC RELEASE OF LANDFILL METHANE.....</b>	170
<i>Eranda Bartholameuz, Patrick Hettiaratchi, Matthew Steele, Tanaji More, Samadhi Gunasekera</i>	
<b>EXPLORATION OF PARAMETERS EFFECTING ENERGY PERFORMANCE OF BUILDING .....</b>	181
<i>Tofiqh Tabesh, Farrin Ghorbanalavi</i>	
<b>FIELD EVALUATION OF SULFOLANE DEGRADATION IN GROUNDWATER USING UV/H<sub>2</sub>O<sub>2</sub>.....</b>	190
<i>Linlong Yu, Sobhan Iranmanesh, Gopal Achari, Cooper H. Langford, Ian Keir</i>	
<b>FOAMING IN AN INNOVATIVE ANAEROBIC MEMBRANE BIOREACTOR TREATING HIGH SOLIDS WASTEWATER .....</b>	192
<i>Joshua Snowdon, Kripa Singh</i>	
<b>GEOTEXTILE FILTRATION FOR IMPROVING SURFACE WATER QUALITY OF EUTROPHIC LAKES.....</b>	201
<i>Catherine Mulligan, Dileep Palakkeel Veetil, Mariana Eliaslara, Esteban Castillo Arriagada, Sam Bhat</i>	
<b>MEMORIAL UNIVERSITY OF NEWFOUNDLAND ON-CAMPUS CYCLING STUDY .....</b>	211
<i>Cynthia Coles, Kashif Rasheed</i>	
<b>MODELING STRUVITE CRYSTALLIZATION IN A BATCH REACTOR USING POPULATION BALANCE MODULE COUPLED WITH 3-D CFD MODEL .....</b>	221
<i>Seyyed Ebrahim Mousavi, Saifur Rahaman</i>	
<b>NOVEL ADVANCED OXIDATION PROCESS (AOPS) BASED ON PRE-MAGNETIZATION FeO FOR WASTEWATER TREATMENT .....</b>	223
<i>Zhou Minghua, Pan Yuwei, Li Xiang</i>	
<b>OIL SANDS PROCESS-AFFECTED WATER (OSPW) MANAGEMENT USING BASAL DEPRESSURIZATION WATER (BDW) IN FORWARD OSMOSIS (FO) .....</b>	226
<i>Shu Zhu, Mohamed Gamal El-Din, Mingyu Li</i>	
<b>OPTIMIZATION OF AERATION IN A SINGLE-STAGE BIOLOGICAL AERATED FILTER FOR THE TREATMENT OF MUNICIPAL WASTEWATER .....</b>	230
<i>Rajan Ray, Rajesh Seth, Paul Henshaw, Nihar Biswas</i>	
<b>OPTIMIZATION OF COMBINED SEWER OVERFLOW (CSO) ENHANCED PRIMARY TREATMENT BY USING DIFFERENT COAGULANTS.....</b>	232
<i>Mohammed Zakee Shaikh, Abdul Mohammed, Mohamed Gamal El-Din</i>	
<b>OPTIMIZATION OF SOLAR POWERED REVERSE OSMOSIS WATER TREATMENT SYSTEMS .....</b>	234
<i>Marina Freire-Gormaly, Amy Bilton</i>	
<b>OZONATION OF SYNTHETIC COMBINED SEWER OVERFLOW: IMPACT ON THE FATE OF SILVER NANOPARTICLES.....</b>	237
<i>Mirna Alameddine, Selamawit Ashagre Messele, Abdul Mohammed, Mohamed Gamal El-Din</i>	
<b>POTENTIAL AIR QUALITY IMPACTS DUE TO HYDRAULIC FRACTURING IN WESTERN NEWFOUNDLAND .....</b>	239
<i>Shareef Mohammed Mujtaba, Tahir Husain</i>	
<b>POWER GENERATION POTENTIAL FROM CYANIDIZED WATER USING OSMOTIC PROCESSES.....</b>	253
<i>Luis Vives, Edgar Quinonez, Carlos Bustos</i>	
<b>REMEDICATION IN CHALLENGING ENVIRONMENTS: PRELIMINARY NUMERICAL SIMULATION AND MEASUREMENT OF UNFROZEN WATER CONTENT FOR AN OUTDOOR PILOT-SCALE BIOPILE IN COLD CLIMATE .....</b>	263
<i>Wonjae Chang, Jihun Kim</i>	

<b>REMEDICATION OF OIL SANDS PROCESS-AFFECTED WATER (OSPW) BY INDIGENOUS MICROORGANISMS BASED BIOFILTRATION .....</b>	<b>271</b>
<i>Lei Zhang, Yanyan Zhang, Mohamed Gamal El-Din</i>	
<b>REMOVAL OF A MODEL NAPHTHENIC ACID - TRANS-4-PENTYLCYCLOHEXANE CARBOXYLIC ACID - USING MESOPOROUS CARBON XEROGEL ADSORBENT .....</b>	<b>274</b>
<i>Mohamed Ibrahim, Selamawit Ashagre Messele, Mohamed Gamal El-Din</i>	
<b>SCALE-UP FACTORS WHEN APPLYING BIOVENTING RESULTS TO THE FIELD .....</b>	<b>276</b>
<i>Richard Zytner, Maryam Eyvazi, Michael Mosco, Alamgir Khan</i>	
<b>TOXICITY AND BIODEGRADABILITY STUDY ON ENHANCED PHOTOCATALYTIC OXIDATION OF POLYCYCLIC AROMATIC HYDROCARBONS IN OFFSHORE PRODUCED WATER .....</b>	<b>278</b>
<i>Bo Liu, Bing Chen, Baiyu (helen) Zhang, Jisi Zheng, Liang Jing</i>	
<b>TREATMENT OF OILY WASTERWATER USING ULTRAFILTRATION MEMBRANES MODIFIED BY NANO PARTICLES .....</b>	<b>280</b>
<i>Xiujuan Chen, Gordon Huang, Chunjiang An</i>	
<b>WHEN MEMBRANE BIOREACTOR MEETS OZONATION: AN POTENTIAL SOLUTION TO THE OIL SANDS PROCESS-AFFECTED WATER (OSPW) ISSUE IN CANADA .....</b>	<b>282</b>
<i>Jinkai Xue, Yanyan Zhang, Yang Liu, Mohamed Gamal El-Din</i>	
<b>Author Index</b>	