

113th Air and Waste Management Association Annual Conference and Exhibition (ACE 2020)

Gateway to Innovation

Online
30 June – 2 July 2020

Volume 1 of 4

ISBN: 978-1-7138-2652-1

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.

The information and opinions expressed in these papers/presentations are solely of the authors and should not be considered as having the endorsement or support of the Association.

Compilation Copyright © (2020) by Air & Waste Management Association.
Copyright of the individual papers are retained by the authors.

Additional copies of these and other A&WMA conference proceedings will be available through the A&WMA Online Store. To place an order, please visit the Online Store at www.awma.org or contact the A&WMA Publications Order Department at onlinestore@awma.org, +1-412-232-3444 (phone) or +1-412-232-3450 (fax).

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact Air and Waste Management Association at the address below.

Air and Waste Management Association
One Gateway Center, 3rd Floor
420 Fort Duquesne Blvd.
Pittsburgh, Pennsylvania 15222-1435
USA

Phone: +1-800-270-3444
+1-412-232-3444
Fax: +1-412-232-3450

info@awma.org

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

VOLUME 1

2014 NORTHERN BAJA CALIFORNIA EMISSIONS INVENTORY (794121).....	1
<i>M. Wolf, G. Manne, P. Simms, J. Koupal, L. Dayton, E. Melgoza</i>	
A CARBON FOOTPRINT MODEL FOR UNIVERSITIES (808922)	16
<i>A. Nasr, A. Al Mallah, M. Bechara, S. Ghanimeh</i>	
A FINE-SCALE ROADWAY EMISSIONS INVENTORY FOR THE WEST OAKLAND COMMUNITY USING TELEMATICS-BASED DATA (809880)	27
<i>Y. Du, S. Reid, A. Seagram, V. Lau, D. Holstius, S. Bai, P. Martien</i>	
A POLLUTANT-BASED STRATEGY FOR MITIGATING CLIMATE AND AIR QUALITY POLLUTANTS (796702).....	37
<i>I. Zamora</i>	
A REVIEW OF STORAGE TANK EMISSION CALCULATION METHODS: STRENGTHS, WEAKNESSES, AND REAL-WORLD EXAMPLES (792294)	45
<i>K. Weichsel</i>	
A SURVEY OF U.S. INDUSTRIAL SUSTAINABILITY REPORTS: PART 2 (786144)	59
<i>K. Macoskey</i>	
ACCELERATING BUILDING DECARBONIZATION IN THE SAN FRANCISCO BAY AREA (813117)	77
<i>A. Teferra, P. Bartholomy, S. Moore, M. Kitahara</i>	
ACHIEVING COMPLIANCE WITH LOW EMISSION FLARES (790384).....	127
<i>D. Thompson, L. Kalani</i>	
ADSORPTION CHARACTERISTICS OF CARBONACEOUS ADSORBENTS FOR ORGANIC COMPOUNDS AND MERCURY IN A MODEL EXHAUST GAS FROM THERMAL TREATMENT PROCESS (795683)	137
<i>K. Kawamoto</i>	
ADVANCES IN PFAS SEPARATION, CONCENTRATION, AND DESTRUCTION IN GROUNDWATER, LEACHATE, AND OTHER WASTES. EXAMPLES FROM FULL SCALE, PILOT SCALE, AND BENCH SCALE APPROACHES. (845366)	150
<i>I. Cooper, J. Lang</i>	
AERMOD AND PRIME2 PLUME RISE ENHANCEMENTS (809296)	155
<i>R. Petersen, J. Paumier</i>	
AIR AND WASTE ISSUES IN THE AGRICULTURAL INDUSTRY	172
<i>G. Schewe, R. Christman, J. Marshall, G. Wanke, B. O'Neil</i>	
AIR DISPERSION MODELING EVALUATION OF PREDICTED FINE PARTICULATE CONCENTRATIONS FROM SELECT NORTH AMERICAN FOREST FIRES (809402)	174
<i>O. Samani</i>	
AIR IMPACTS OF THE MARIJUANA INDUSTRY (809567)	185
<i>K. Urso, A. Khlystov</i>	

AIR LEGISLATION, REGULATION & POLICY DEVELOPMENTS PANEL (795383)	187
<i>P. Siebert, T. Palma, T. Dillow</i>	
WHAT YOU NEED TO KNOW ABOUT THE NEW ETHYLENE AND MON MACT REQUIREMENTS	188
<i>T. Dillow</i>	
AIR MONITORING AND MEASUREMENTS	196
<i>R. Osa, P. Clark</i>	
AIR MONITORING TOPICS.....	198
<i>R. Osa, P. Srirama</i>	
AIR PERMITTING AND COMPLIANCE: PROBLEMS, SOLUTIONS AND CASE STUDIES I	201
<i>J. Krawczyk, P. Siebert, A. Famoud, L. Cottrell, K. Bencosme, A. Siefers, C. Casteix, K. Weichsel</i>	
AIR PERMITTING AND COMPLIANCE: PROBLEMS, SOLUTIONS AND CASE STUDIES II.....	204
<i>J. Krawczyk, P. Siebert, Y. Sunwoo, K. Bhang, J. Huh, Y. Chung, E. Lee, H. Choi, J. Moore, M. Hazur</i>	
AIR PERMITTING CHALLENGES FOR THE COMMODITY FUMIGATION INDUSTRY (807200)	207
<i>R. Christman, J. Marshall</i>	
AIR PERMITTING COMPLICATIONS FOR LEACHATE EVAPORATORS (812265).....	218
<i>S. Mohammad, C. MacDougall, D. Stein</i>	
AIR PERMITTING PROBLEMS AND SOLUTIONS (795407).....	228
<i>P. Siebert</i>	
NSPS OOOOA COMPLIANCE CHALLENGES: RULE OVERLAP	229
<i>S. Bittick</i>	
INDUSTRUAL AIR QUALITY PERMITTING	237
<i>K. Eldridge</i>	
ISSUES REGARDING NSR AND TITLE V PERMIT CONDITIONS	245
<i>G. McCutchen</i>	
AIR POLLUTION CONTROL TECHNOLOGIES II	262
<i>N. Schindler, C. Baukal Jr., A. Dewidar, S. Srinivasan, M. Jahandar, K. Kawamoto</i>	
AIR POLLUTION CONTROL TECHNOLOGIES II.....	266
<i>M. Pham, N. Schindler, H.-Y. Lin, C.-S. Yuan, Y. Nazarenko, D. Thompson</i>	
AIR POLLUTION ISSUES IN LATIN AMERICA	269
<i>D. Dorronsoro, R. Echeverria, K. Mosquera, R. Sosa</i>	
U.S. AIR QUALITY CAPACITY BUILDING FELLOWSHIP.....	271
<i>K. Schaffner</i>	
AIR QUALITY IMPACT OF OFF PEAK DELIVERY OF GOODS IN THE REGIONAL MUNICIPALITY OF PEEL.....	280
<i>M. Gauthier, J. Lundgren, G. Conley, J. Veerman, J. Kashyap, G. Bizhani, L. Aubin, K. Brown, N. Lotecki</i>	

AIR QUALITY ISSUES SURROUNDING COVID-19 INTRODUCTIONS	293
<i>C. Webb, H. Ginzburg, A. Prados, M. Flagg, J. Balmes, H. Frey</i>	
AIR QUALITY ISSUES SURROUNDING COVID-19: LESSONS LEARNED AND OPPORTUNITIES FROM THE EFFECT OF THE PANDEMIC ON AIR QUALITY	297
<i>H. Frey</i>	
AIR POLLUTION AND COVID-19: PERSPECTIVES FROM A PHYSICIAN-SCIENTIST.....	312
<i>J. Balmes</i>	
SHELTER IN PLACE AND CHANGES IN AIR QUALITY.....	323
<i>M. Flagg</i>	
AIR QUALITY MONITORING FROM SPACE DURING COVID-19	336
<i>A. Prados</i>	
AIR QUALITY MEASUREMENTS IN DEVELOPING COUNTRIES I.....	346
<i>Z. Farooqui, C. Odame-Ankrah, K. Schaffner, S. Kumar, A. Srivastava, R. Martin, A. Khader</i>	
AMMONIA MONITORING IN CONTINUOUS EMISSIONS MONITORING SYSTEMS	348
<i>B. Chandan, P. Phithaksounthone, D. Sarkar, B. Marshik, G. Cacciatore, M. Nelson</i>	
NH3 ANALYZERS AND HOW THEY FARE UNDER PS-18 AND PPS-001	363
<i>B. Marshik</i>	
AMMONIA CONTINUOUS EMISSIONS MONITORING SYSTEMS IN THE BAY AREA	373
<i>P. Phithaksounthone</i>	
TDLs AMMONIA CEMS MONITORING TECHNOLOGY & INSTALLATION EXPERIENCE	378
<i>G. Cacciatore</i>	
AN ARTIFICIAL INTELLIGENCE FRAMEWORK TO FORECAST AIR QUALITY	392
<i>R. Ren, C.-P. Kuo</i>	
AN OVERVIEW AND NEXT STEPS FOR CALIFORNIA'S LOW CARBON FUEL STANDARD	401
<i>C. Drotman, R. Huff, H. DeLong</i>	
AN OVERVIEW OF AIR QUALITY AND NITROGEN DIOXIDE TRANSFORMATION DURING THE LAKE MICHIGAN OZONE STUDY 2017	412
<i>C. Odame-Ankrah</i>	
AN OVERVIEW OF PFAS IN ELECTROPLATING AND REFINERY SITES.....	425
<i>A. McGrath</i>	
ANAEROBIC DIGESTION, REFUSE-DERIVED FUEL, AND WASTE MANAGEMENT PLANNING.....	435
<i>S. Ghanimeh, D. Greene</i>	
ANALYSIS OF POSSIBLE NUTRIENT STREAMS FOR BIO-TRICKLING FILTERS TREATING HAPs IN ETHANOL PLANTS	437
<i>K. Mowat, A. Hassan, B. Dvorak</i>	
ANTHROPOGENIC SOURCE CONTRIBUTIONS TO OZONE FORMATION IN THE GREATER HOUSTON AREA.....	448
<i>I. Hossain, R. Kommalapati, H. Du</i>	

APPLICABILITY OF ENERGY RECOVERY TECHNOLOGIES FOR WASTEWATER TREATMENT (806289)	458
<i>A. Lasode, W. Northrop</i>	
APPLICATION OF A GENERIC CALIBRATION GUIDANCE TO ASSESS THE PRECISION OF VISSIM TO GENERATE REAL-WORLD VEHICLE ACTIVITY FOR RELIABLE EMISSIONS ESTIMATES (809767).....	469
<i>G. Bou-Saab, A. Venkatachalapathy, S. Hallmark, O. Smadi, D. Xiao</i>	
APPLICATION OF TRANSIT BUS EMISSIONS MODEL TO EMISSION ESTIMATION: CASE STUDY FOR A WOLFLINE TRANSIT BUS LINE AT NORTH CAROLINA STATE UNIVERSITY (793778)	481
<i>T. Wei, H. Frey, W. Yuan</i>	
ASSESSING EXPOSURE AND HEALTH EFFECTS AND CONTROL OF REGULATED AND NON-REGULATED AIR POLLUTANTS I	499
<i>J. Morrow, D. McCreedy, J. Kominsky, H. Rous, J. Westbrook, A. Dutta, W. Jinsart, R. Sandhu, M. Kleinman</i>	
ASSESSING EXPOSURE AND HEALTH EFFECTS AND CONTROL OF REGULATED AND NON-REGULATED AIR POLLUTANTS II	502
<i>D. McCreedy, J. Morrow, H. Hilken, H. Chapman, H. Jung, D. Holstius</i>	
ASSESSING PFOA CONTRIBUTION FROM PREDECESSOR AND CURRENT INDUSTRIAL OPERATORS.....	506
<i>E. Wood</i>	
ASSESSMENT OF FACTORS THAT AFFECT HYDROGEN SULFIDE CORROSION OF MANHOLE SHAFTS	516
<i>S. Hada, M. Chakraborty, K. Shah, N. Parsaeifard, A. Mohanakrishnan, H. Rahimi, A. Sinha, R. Choquis, O. Adelegan, D. Kothai, H. Ali, N. Wooten, G. Iyer, M. Rafatazama, S. Techapaphawit, M. Sattler, V. Chen, A. Bhatt</i>	
ASSESSMENT OF TECHNOLOGY USED FOR REFINERY AIR QUALITY FENCELINE MONITORING	529
<i>C. MacDonald, R. Moffet, P. Roberts, J. Marrero, R. Gibbons</i>	
ATMOSPHERIC CHEMISTRY - PM & OZONE	542
<i>Y. Li, L.-W. Chen, H. Simon</i>	
ATMOSPHERIC DEPOSITION OF PERFLUOROALKYL SUBSTANCES	544
<i>K. Vijayaraghavan, B. Cosic, R. Beardsley, M. Traister, K. Cooper</i>	
AUTONOMOUS REAL-TIME VOC ANALYZER & PASSIVE FENCELINE TUBES – DATA COMPARISON OF NEW TECHNOLOGY TO METHOD 325	552
<i>J. Robles</i>	
AVIATION NOISE MEASUREMENTS AND ACOUSTICAL TESTING PROGRAMS	560
<i>D. Scarano</i>	
BENEFICIAL USE OF LANDFILL GAS: OPPORTUNITIES AND CHALLENGES	566
<i>D. Greene, M. Sattler, S. Patel, I. Kapoor, N. Berge, M. Tahiyat, T. Farouk, S. Hoque, T. Widboom, D. Elam Jr., S. Mohammad, C. MacDougall, D. Stein</i>	
BETTER MONITORING FOR BETTER ENFORCEMENT OF THE MARPOL SULFUR IN FUEL STANDARD (796014).....	569
<i>M. Haber, S. Kakade</i>	

BLOCK BY BLOCK: LINKING HYPERLOCAL MODELING WITH EQUITY-BASED TARGETS FOR EXPOSURE REDUCTION	577
<i>D. Holstius, P. Martien, V. Lau, S. Reid, A. Seagram, Y. Du, B. Koo, Y. Jia, M. Nguyen, J. Cordova, S. Bai, M. Gordon, B. Beveridge</i>	
BRIDGING THE DATA FLOW GAP IN ENVIRONMENTAL COMPLIANCE AND REPORTING (794301)	589
<i>M. Hazur</i>	
CALCULATING STREET-LEVEL TRAFFIC EMISSIONS IN REAL TIME IN RICHMOND, CALIFORNIA (795203)	598
<i>T. Olevski, J. Bandoro, K. Richman, J. Luongo, M. Dvorak, G. Yarwood, S. Libicki</i>	
CALIFORNIA AIR QUALITY ISSUES, FENCELINE MONITORING & AIR MONITORING STUDIES	605
<i>D. Long, Z. Farooqui, C. MacDonald, J. Marrero, T. Vencill, J. Range, S. Reid</i>	
CALIFORNIA’S LATEST APPROACH TO IDENTIFYING AND REDUCING THE BURDEN OF AIR TOXICS (809790)	607
<i>H. Rous, A. Rice</i>	
CASE STUDIES ON PRACTICAL APPLICATION OF REAL TIME FIELD APPROACH TO IDENTIFY AND MITIGATE PATHWAYS OF VAPOR INTRUSION INTO BUILDINGS (795141)	617
<i>A. Lee, M. Plate, L. Abreu, B. Schumacher, J. Zimmerman, A. Williams</i>	
CASE STUDY - MODELED EMISSION RATES FOR PRECURSORS VERSUS SCICHEM SINGLE SOURCE MODELING (795562)	628
<i>L. Santos, T. Schroeder, J. Szust, T. Wei</i>	
CHANGES IN OZONE PRODUCTION CHEMISTRY ACROSS THE U.S. BETWEEN 2007 AND 2016: AN INTEGRATED MODELING ASSESSMENT (785809)	638
<i>H. Simon, S. Koplitz, L. Valin, A. Whitehill, N. Possiel, B. Henderson, K. Baker, B. Wells</i>	
CHARACTERIZATION OF TURBULENCE NEAR ROADWAYS BASED ON SHORT-TERM MEASUREMENTS OF TURBULENCE KINETIC ENERGY AND TRAFFIC CONDITIONS (795249)	655
<i>Z. Hu, K. Noll</i>	
CHARACTERIZING AND REDUCING EMISSIONS FROM LANDFILLS AND WASTE-TO-ENERGY	662
<i>M. Sattler, S. Ghanimeh, N. Parsaeifard, M. Sattler, G. Cohen, A. Hassan, B. Dvorak, M. Al-Faliti, C. Cretiu, M. Atwell, C. Campbell, C. Frei</i>	
CLIMATE FEEDBACK OF ANTHROPOGENIC BLACK CARBON EMISSIONS IN THE ARCTIC REGION (809320)	665
<i>J. Fu, X. Dong</i>	
CO ₂ REDUCTIONS IN STATES OF THE REGIONAL GREENHOUSE GAS INITIATIVE IN COMPARISON WITH REDUCTIONS IN THE PJM STATES, 2008 – 2018 (809381)	669
<i>T. McNevin</i>	
COAL-FIRED POWER PLANT CONDENSABLE PARTICULATE MATTER EMISSION FACTORS (794612)	677
<i>B. Parker</i>	

VOLUME 2

COMBINED CYCLE GAS TURBINE STARTUP EMISSIONS (793913)	686
<i>J. Haywood</i>	
COMETABOLIC TREATMENT OF EMERGING GROUNDWATER CONTAMINANTS (790359)	702
<i>P. Hatzinger</i>	
COMMUNITY/GOVERNMENT PARTNERSHIP TO IMPROVE LOCAL AIR QUALITY AND HEALTH IN WEST OAKLAND (809084).....	715
<i>M. Gordon, B. Beveridge, H. Hilken</i>	
COMMUNITY-FOCUSED EMISSION REDUCTIONS: TECHNICAL IMPLEMENTATION OF CALIFORNIA'S AB 617 LAW	724
<i>J. Kochler, H. Rous, A. Rice, J. Finkle</i>	
COMPARING PM DATA FROM REFERENCE, FENCELINE AND LOW-COST SENSORS – A PATH TO ENSURE DATA QUALITY (788714).....	726
<i>S. Boehm, S. Avula, K. Turnquist, J. Koczak, A. Zerrath</i>	
EMERGING TECHNOLOGY STRATEGIES FOR SAMPLING AND QUANTITATION OF HRVOC AND OHAP FROM EMISSION SOURCES. (809324)	736
<i>S. Yuchs</i>	
COMPARISON OF RISK ASSESSMENT MODELS AND RESULTS FOR NATIONAL AND STATE LEVEL HEALTH RISK ASSESSMENTS (809818).....	751
<i>M. Kaplan, S. Carcieri</i>	
COMPREHENSIVE AMBIENT AIR MONITORING ACROSS NORTH TEXAS FROM 2014- 2019 (809680)	760
<i>J. Granstra, S. Jenkins</i>	
CORPORATE IMPLEMENTATION OF SUSTAINABILITY CASE STUDIES.....	775
<i>R. Ramanan, G. Bou-Saab</i>	
CREATING VALUE WITH MANAGED CORPORATE ENVIRONMENTAL COMPLIANCE & ASSET MANAGEMENT SERVICES (810015).....	782
<i>D. Shotts</i>	
CURRENT ISSUES IN AVIATION NOISE AND NOISE MODELING (809131).....	792
<i>R. Mentzer Jr.</i>	
ISSUES RELATED TO WESTERN STATES REGIONAL HAZE STATE IMPLEMENTATION PLANS	804
<i>R. Morris</i>	
CURRENT STATE OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) EMISSIONS TESTING AND NEGOTIATION OF THE AIR PERMIT CONDITIONS THAT CAN RESULT. (794728).....	810
<i>A. Driscoll, T. Russell</i>	
DATA CENTER PERMITTING LANDSCAPE ACROSS THE UNITED STATES (807953).....	818
<i>A. Farnoud, L. Cottrell, K. Bencosme</i>	

DERIVING A CLIMATE-STABILIZING SOLUTION SET OF FLEET-EFFICIENCY AND DRIVING-LEVEL REQUIREMENTS FOR LIGHT-DUTY VEHICLES IN CALIFORNIA (796315)	826
<i>M. Bullock</i>	
DETAILING BAG FAILURE PROBLEMS AND SOLUTIONS IN BAGHOUSES (795052)	855
<i>J. McKenna, R. Dupont, L. Theodore</i>	
DEVELOPING A PATH FORWARD FOR PM2.5 REGULATION IN THE BAY AREA (840001)	867
<i>M. Kleinman</i>	
DEVELOPING A SOLID WASTE RESOURCE MANAGEMENT PLAN TO ACHIEVE ECONOMIC AND ENVIRONMENTAL SUSTAINABILITY IN ANN ARBOR, MICHIGAN (794899)	871
<i>C. Seibert</i>	
DEVELOPING QUALITY CHECKS FOR REAL-TIME LOW-COST PM2.5 SENSORS DEPLOYED BY CITIZEN SCIENTISTS (809609)	883
<i>P. Doraiswamy, P. Gupta, O. Pikeinaya, B. Feenstra, R. Levy, K. Mills</i>	
DEVELOPMENT OF A STANDARD TESTING METHOD FOR VEHICLE CABIN AIR QUALITY INDEX (823483)	893
<i>H. Jung, L. Pham, K. Johnson, N. Molden, S. Boyle</i>	
DEVELOPMENT OF MICRO-SIMULATION TRAFFIC & EMISSION MODEL TO APPROXIMATE AIR EMISSIONS: CASE STUDY: NAHER-EL KALEB -MAAMLTEIN HIGHWAY (791209).....	906
<i>L. Salameh, D. Jawad</i>	
DISTRICT ENERGY – A LOOK INTO THE FUTURE (792552).....	921
<i>A. Isaac</i>	
DETECTION, IDENTIFICATION AND QUANTIFICATION OF STACK GAS EMISSIONS AT PORT OF ROTTERDAM USING THERMAL INFRARED HYPERSPECTRAL IMAGING. (793309)	929
<i>J.-P. Gagnon, J. Korsman, H. Bison, P.-Y. Foucher</i>	
A NOVEL APPROACH TO EVALUATING THE EFFECTS OF WATERPIPE SMOKING ON CARDIAC SIGNALING (840010).....	935
<i>R. Sandhu</i>	
ECONOMIC EFFICIENCY AND ENVIRONMENTAL IMPACTS OF URBAN FOOD RECOVERY PROGRAMS: A FEASIBILITY ANALYSIS OF SMART TECHNOLOGY APPLICATION IN CHICAGO (808109).....	943
<i>J. Zheng, N. Ai</i>	
E-ENTERPRISE FOR THE ENVIRONMENT: IMPACT ON INDUSTRIAL REPORTS	953
<i>N/A</i>	
EFFECT OF CHANGES SINCE 2017 ON THE QUALITY, CREDIBILITY, AND INTEGRITY OF SCIENTIFIC REVIEW OF NATIONAL AMBIENT AIR QUALITY STANDARDS (795502).....	955
<i>H. Frey</i>	
EFFECTIVE APPROACHES FOR DEVELOPING SCIENCE-BASED GHG TARGETS (790607)	978
<i>E. Laude</i>	

EFFECTIVENESS OF BIOSURFACTANT FOR TOLUENE REMOVAL IN BIOTRICKLING FILTERS OPERATING UNDER STRESSED OPERATING CONDITION (791640).....	990
<i>A. Dewidar, G. Sorial</i>	
EFFECTS OF DIELECTRIC BARRIER DISCHARGE ON REMOVAL OF SILOXANES IN PRESENCE OF CO ₂ STREAM-DESIGN CONSIDERATIONS (795701)	999
<i>M. Tahiyat, S. Patel, I. Kapoor, N. Berge, T. Farouk, S. Hoque</i>	
EMISSION INVENTORY FOR MOBILE SOURCES	1008
<i>K. Ortegon, S. Ioque, Y. Du, I. Mathis, T. Olevski, M. Wolf</i>	
WIND CONDITIONS AND OZONE EXCEEDANCES IN HOUSTON AND OTHER CITIES IN TEXAS: IMPLICATIONS FOR STATE IMPLEMENTATION PLANS (792202)	1012
<i>W. Vizuetete</i>	
ENERGY AND WATER SUSTAINABILITY OF BIOREFINERIES - 2018 SURVEY OF COMMERCIAL BIOFUEL FACILITIES (795869)	1022
<i>M. Wu</i>	
ENERGY-WATER-WASTE NEXUS	1033
<i>C. Chao, C. Lutes, A. Lasode, J. Chen, K. Mowat, V. Pitre, S. Hada</i>	
ENGAGING SCHOOL COMMUNITIES IN AIR SENSORS: LOVE MY AIR DENVER (793051)	1037
<i>A. Burgess</i>	
ENVIRONMENTAL IMPACT EVALUATION OF THE HOUSTON-DALLAS HIGH SPEED RAIL SYSTEM USING LIFE CYCLE ASSESSMENT (795410).....	1061
<i>R. Kommalapati, H. Du, D. Choe</i>	
ENVIRONMENTAL PERMITTING FOR UPGRADING AND SUPPLYING RNG (808678).....	1073
<i>T. Widboom</i>	
2020 CARB PROGRAM PRIORITIES	1084
<i>R. Corey</i>	
ESTIMATING ON-ROAD VEHICLE DENSITY USING CROWDSOURCED DATA AND MONTE CARLO ANALYSIS (809377)	1102
<i>B. Freeman, J. The, B. Gharabaghi</i>	
EVALUATION OF IMPACT OF MARINE EMISSIONS ON AIR QUALITY AND POTENTIAL POLICY FORMULATION IN A REPRESENTATIVE INDIAN PORT (794781).....	1119
<i>J. Biswas, A. Mandal, Z. Farooqui, S. Roychowdhury</i>	
EVALUATION OF LOW-COST SENSOR FOR PM _{2.5} ASSESSMENT: A CASE STUDY OF CALIFORNIA STATE (788034).....	1123
<i>Z. Farooqui, J. Biswas, S. Roychowdhury, S. Ghosh</i>	
EXPERIENCE CONTROLLING EMISSIONS FROM WASTE TO ENERGY APPLICATIONS (795064)	1128
<i>M. Atwell, C. Cretiu</i>	
FACTORS INFLUENCING WILLINGNESS TO PAY AND PARTICIPATE FOR CURBSIDE COMPOSTING. A CASE STUDY IN URBANA, ILLINOIS (809588).....	1136
<i>S. Pai, N. Ai</i>	

FAR-FIELD PRIMARY AND SECONDARY PM2.5 MODELING WITH SCICHEM FOR SELECT GENERIC SOURCE CONFIGURATIONS AT A HYPOTHETICAL SOURCE LOCATED ON THE COAST OF NORTH CAROLINA (809361)	1151
<i>M. Porter</i>	
FENCELINE MONITORING.....	1165
<i>R. Osa, P. Srirama, A. Zerrath, S. Boehm, J. Granstra</i>	
FOOD AND FLORA WASTE TO FLEET FUEL: DEVELOPMENT AND APPLICATION OF THE F4 FRAMEWORK (795499).....	1168
<i>M. Chakraborty, A. Boskabadi, F. Naz, U. Domadia, N. Raven, A. Behseresht, M. Sattler, A. Bhatt, K. Hyun, A. Anjomani, C. Krejci, V. Chen</i>	
FOSSIL FUEL GENERATORS IN THE BAY AREA REGION: CUMULATIVE AIR QUALITY IMPACTS AND SOLUTIONS (808012)	1181
<i>A. Dao, K. Schkolnick</i>	
GHG LIFE-CYCLE COMPARISON: WASTE-TO-ENERGY VS. LANDFILLING, WASTE-TO-ENERGY VS. RECYCLING (812763)	1188
<i>C. Campbell, C. Frei</i>	
GREENHOUSE GASES AND CRITERIA AIR CONTAMINANT EMISSIONS FROM ALTERNATIVE FUEL COMBUSTION IN CEMENT MANUFACTURING (809372)	1202
<i>V. Pitre, H. La, J. Bergerson</i>	
CUMULATIVE HEALTH RISK ASSESSMENT METHODS AND THE COMMUNITY AIR PROTECTION PROGRAM (AB 617) (809877).....	1210
<i>B. Schuster, S. Patterson, C. Easter</i>	
HIGH-RESOLUTION MODELING OF AIR QUALITY IMPACTS OF MAJOR POINT SOURCES IN THE SAN FRANCISCO BAY AREA (809601)	1218
<i>B. Koo, Y. Jia, S. Reid, Y. Fang, J. Matsuoka</i>	
HOW DOES IT WORK? – CLIMATE RISK AND ADAPTATION (803531).....	1229
<i>R. Beardsley</i>	
CLIMATE ADAPTATION MANAGEMENT IN LOCAL GOVERNMENT.....	1240
<i>E. Rubenstein</i>	
HOW DOES IT WORK? – CLIMATE RISK AND ADAPTATION (803531).....	1246
<i>N. Bengtsson</i>	
HYBRID AIR QUALITY MODELING IN WEST OAKLAND TO SUPPORT THE DEVELOPMENT OF AN EMISSIONS REDUCTION PROGRAM	1253
<i>S. Reid, B. Koo, Y. Jia, J. Cordova, V. Lau, A. Seagram, Y. Du, M. Nguyen, D. Holstius, P. Martien</i>	
HYDRO-DECHLORINATION OF 2,4,4' TRICHLOROBIPHENYLS.....	1263
<i>J. Xu, M. Lu, K. Zhou, A. Mata</i>	
IMPROVED PM2.5 EMISSIONS FACTORS FOR NATURAL GAS-FIRED RICH-BURN RECIPROCATING ENGINES	1271
<i>G. England, R. Baures, P. Menten, K. Winborn-Miller, J. Urisk</i>	
STANDARDIZE CODE TABLES FOR A COMBINED AIR EMISSION REPORTING SYSTEM (807374)	1281
<i>C. Wu, J. Gamas, J. Wang, B. Way, K. Poole</i>	

IMPROVEMENTS TO EPA'S SPECIATE DATABASE: SPECIATE 5.0 (794642).....	1290
<i>C. Bray, M. Strum, M. Menetrez, V. Rao, S. Bendomdhane, H. Simon, B. Murphy, G. Pouliot, H. Pye, I. George, L. Nessley, J. Geidosch, M. Hays, Y. Hsu, F. Divita</i>	
IMPROVING ENVIRONMENTAL COMPLIANCE AND MINIMIZING BUSINESS RISK THROUGH CORPORATE-DRIVEN STANDARDS (809551)	1300
<i>J. Moore</i>	
IMPROVING ESTIMATION OF AIR EMISSIONS FOR DEEP-DRAFT COMMERCIAL MARINE VESSELS (CMVS) BASED ON USE OF COMPREHENSIVE HULL GEOMETRY SPECIFICATIONS FOR RESISTANCE, POWERING, & EMISSIONS BY VESSEL TYPE (811345)	1306
<i>C. Baker, N. Delgado, P. Roussos, I. Mathis, J. Chung, J. Dorn</i>	
IN THE THICK OF THE REGIONAL HAZE RULE'S SECOND DECADAL REVIEW (795161).....	1320
<i>B. Paine</i>	
INCREASING METHANE OXIDATION IN CLAY LANDFILL COVER USING ALTERNATE ELECTRON ACCEPTORS (795618).....	1332
<i>N. Parsaeifard, M. Sattler, B. Nasirian, V. Chen</i>	
INNOVATIVE TECHNIQUES WITH AERMOD.....	1345
<i>T. Schroeder, P. Staniaszek, R. Petersen, J. Biswas, L. Warren</i>	
INTEGRATING MOBILE MAPPING INTO AIR QUALITY ASSESSMENT AND ACTION (794127)	1347
<i>K. Hoag</i>	
INTRODUCTION AND BENEFITS OF THE PROJECT MANAGEMENT OVERSIGHT (PPMO) CONCEPT FOR CCR CLOSURE PROJECTS (845798)	1348
<i>P. Belmonte, P. Brosnan</i>	
INVESTIGATION OF CO ₂ CAPTURE BY BY-PRODUCTS OF STEEL PLANT (781265).....	1356
<i>H.-Y. Lin</i>	
LANDFILL ENVIRONMENTAL PERMITTING AND COMPLIANCE TO SUPPORT RENEWABLE NATURAL GAS PRODUCTION (809672)	1368
<i>C. Casteix, A. Siefers</i>	

VOLUME 3

LARGER PORE SIZE AND HIGHER INTRAWALL PORE VOLUME OF THE SUPPORT ENHANCE THE CO ₂ ADSORPTION PERFORMANCE OF AMINE-TETHERED SBA-15 SILICA (795009)	1376
<i>M. Lashaki, A. Sayari</i>	
LEGAL DRIVERS FOR CLIMATE CHANGE ADAPTATION, MITIGATION, AND RESILIENCY (782020)	1393
<i>M. Dobbins</i>	
CLIMATE CHANGE ASSESSMENT IN DUE DILIGENCE.....	1406
<i>S. Kembball-Cook</i>	
LESSONS LEARNED FROM DEPLOYING HIGH DENSITY LOW-COST SENSOR NETWORKS IN CITIES	1418
<i>D. Lu</i>	

LOCAL AIR MONITORING ISSUES	1429
<i>O. Samani, R. Osa</i>	
MAKING THE INVISIBLE VISIBLE: DEVELOPING AND DEPLOYING A HYPERLOCAL AIR POLLUTION MONITORING SYSTEM TO DRIVE CLEAN AIR ACTION IN YOUR CITY (794197)	1431
<i>H. Rickenbacker</i>	
DEVELOPING COMPANY STANDARDS FOR GLOBAL OPERATIONS.....	1437
<i>M. Hult</i>	
3M EHS ACQUISITION-INTEGRATION AND DIVESTITURE PROGRAM.....	1444
<i>M. Acker</i>	
DEVELOPING COMPLIANCE PROGRAMS TO REDUCE ENVIRONMENTAL COMPLIANCE RISK.....	1453
<i>M. Manninen</i>	
MANAGING PROJECT RISK - SUBCONTRACTOR PRE-QUALIFICATION (795856)	1460
<i>V. Young, P. Brush</i>	
MANAGING VAPOR INTRUSION PROJECTS IN THE CERCLA PROCESS (808537).....	1465
<i>C. Lutes, M. Bedan, J. Lowe, L. Lund</i>	
MARITIME & AVIATION EMISSIONS AND NOISE	1477
<i>D. Scarano, R. Wayson, M. Haber, R. Mentzer Jr.</i>	
MEASURES FOR PM CONCENTRATION REDUCTION IN KOREA - FROM INTERNATIONAL COOPERATION TO PUBLIC EDUCATION - (793702)	1479
<i>Y. Sunwoo, H. Choi, Y. Chung, E. Lee, J. Huh, S.-H. Shin, K. Bhang</i>	
METEOROLOGICAL AND AIR QUALITY ANALYSIS OF THE CAMP FIRE, NOVEMBER 2018 (809470)	1489
<i>A. Klausmann, S. Ramaswamy</i>	
METEOROLOGICAL DETRENDING EVALUATION OF OZONE AND PRECURSOR CONCENTRATIONS MONITORED IN THE HOUSTON SHIP CHANNEL REGION (794785)	1500
<i>R. Komalapati, V. Botlaguduru, H. Du</i>	
METHANE EMISSIONS INVENTORY OF MAJOR SOURCES IN THE SAN FRANCISCO BAY AREA OF CALIFORNIA USING A TIERED MEASUREMENT SYSTEM (807470)	1512
<i>S. Newman, A. Guha, T. Ding, D. Fariley, L. Cackette, P. Martien, D. Cusworth, K. Foster, A. Thorpe, R. Duren, M. Fischer, S. Jeong, N. Yesiller, J. Hanson</i>	
METHANE REDUCTION STRATEGIES IN UNCONVENTIONAL NATURAL GAS (794584)	1523
<i>L. Blinn</i>	
MODEL PERFORMANCE EVALUATIONS: HOW MANY RECEPTORS SHOULD BE USED FOR SHORT TERM STANDARD EVALUATIONS FOR GAUSSIAN MODELS (809406).....	1532
<i>D. Long</i>	
MODELING AIR QUALITY AND HEALTH IMPACTS OF THE 2017 CALIFORNIA WILDFIRES (809808)	1548
<i>Y. Jia, S. Reid, B. Koo, S. O'Neill, S. Raffuse, M. Diao</i>	

MODELING SOIL BACKGROUND CONCENTRATIONS OF POLYNUCLEAR AROMATIC HYDROCARBONS FROM WILDFIRES (795298).....	1554
<i>K. Patel-Coleman, M. Nelson</i>	
MOVING BEYOND THE EARLY ADOPTERS: CHARGING INFRASTRUCTURE FOR THE FUTURE (781522).....	1566
<i>M. Tang</i>	
MULTIDISCIPLINARY STRATEGIES FOR GREENHOUSE GAS REDUCTIONS.....	1571
<i>J. Koehler, H. Rao, A. Young, H. DeLong, L. McGuire, J. Bede</i>	
NANOTECHNOLOGY - APPLICATIONS, RESEARCH ADVANCES AND SAFETY ISSUES (810390)	1574
<i>Y. Nazarenko</i>	
INHALATION EXPOSURES TO NANOPARTICLES DUE TO THE USE OF NANO-ENABLED CONSUMER PRODUCTS.....	1576
<i>G. Mainelis</i>	
NANOPARTICLE SOURCES AND THE MEASUREMENT METHODS AND REGULATIONS TO ADDRESS THEM	1592
<i>R. Anderson</i>	
FIBER SAMPLING TECHNIQUES FOR CARBON NANOTUBES	1608
<i>C. Tsai</i>	
NANOTECHNOLOGY - UPSIDES, CONCERNS AND A PROACTIVE EHS APPROACH	1622
<i>B. Looney</i>	
OVERVIEW OF NSR REGULATORY REFORM.....	1641
<i>S. Broome</i>	
NSR LEGAL AND REGULATORY DEVELOPMENTS	1649
<i>E. Hiser</i>	
NSR UPDATE	1657
<i>D. Jordan</i>	
NSR PROGRAM UPDATES.....	1667
<i>R. Rao</i>	
NEXT GENERATION TUNABLE DIODE LASER (TDL) ANALYZER UTILIZING NEAR-IR AND INTERBAND CASCADE MID-IR WAVELENGTHS FOR SOURCE LEVEL EMISSION MONITORING (794495).....	1676
<i>T. Kuiken</i>	
NONPARAMETRIC TRAJECTORY ANALYSIS TO LOCATE SOURCES AFFECTING FENCE-LINE MONITORING (794965).....	1696
<i>R. Wallace, K. Hunt, R. Henry</i>	
NOVEL, REAL-TIME MEASUREMENTS OF ETHYLENE OXIDE USING A CAVITY RING-DOWN SPECTROMETER (CRDS) (809073).....	1702
<i>G. Lucic, C. Rella, J. Hoffnagle, K. Skog, L. McHale</i>	
OLD SMOKEY POWER – TRANSFORMING AGING POWER PLANTS (845794).....	1710
<i>P. Belmonte, P. Brosnan</i>	

ONE HEALTH COLLABORATIONS: KEY TO ADVANCING ENVIRONMENTAL HEALTH APPLICATIONS (809085)	1721
<i>H. Chapman</i>	
OPERATIONAL TWO-WAY COUPLED AIR QUALITY MODELING SYSTEM FOR COASTAL ENVIRONMENTS: WRF-CHEM BENCHMARKING (795781).....	1733
<i>M. Jones, M. Newman</i>	
OPTIONS FOR INDUSTRIAL BUSINESSES TOWARD ACHIEVING CARBON REDUCTION TARGETS (830034)	1741
<i>L. McGuire, H. Jin, B. Neary</i>	
ORGANOPHOSPHATE EXPOSURE ASSESSMENT (AIR AND SURFACE) ON COMMERCIAL AIRCRAFT FLIGHT DECKS. (784625).....	1764
<i>J. Kominsky</i>	
OVERCOMING THE LABYRINTH OF MIXED SIGNALS FOR BIOGAS UTILIZATION IN CALIFORNIA (802756)	1771
<i>V. Evans</i>	
OXIDATION ENHANCEMENT OF HG0 BY USING WO3/CEO2/TIO2 CATALYSTS (780969)	1776
<i>C.-S. Yuan, X.-W. Huang, S.-W. Wang, J.-Z. Yang, H. Shen</i>	
PARAMETERIZATION OF NEAR ROADWAY DISPERSION FOR INCORPORATION INTO AERMOD AND CALINE4 MODELS (791116).....	1784
<i>Y.-T. Yu, K. Noll</i>	
PARTICULATE DEPLETION MODELLED BY CALPUFF IN PLUMES FROM MINES SURROUNDED BY DENSE VEGETATION (794254).....	1796
<i>P. Staniaszek, R. Rudolph</i>	
PARTICULATE DOES MATTER, A STUDY OF AIR QUALITY IN CALI, COLOMBIA (792456)	1811
<i>K. Ortegon, J. Carvajal, C. Agudelo, A. Bravo, D. Marin</i>	
PARTICULATE MATTER POLLUTION IN HOOKAH LOUNGES IN PALESTINE (799393)	1825
<i>R. Martin, A. Khader</i>	
PARTNERSHIP PRACTICES IN SUSTAINABILITY AND CIRCULAR ECONOMY (809066).....	1830
<i>C. Chao, S. Vigil, S.-C. Yeh, Y. Fukushima, S. Pai, J. Kao</i>	
PER- AND POLYFLUOROALKYL SUBSTANCES IN LANDFILL LEACHATES PRODUCED FROM DIFFERENT WASTE TYPES (807642).....	1887
<i>J. Lang</i>	
PERCEPTION ANALYTICS: NEW TECHNOLOGY TO SUPPORT EHS INSPECTIONS (840007)	1895
<i>G. Mathew, G. Rieser</i>	
PERFORMANCE COMPARISONS OF COOPERATIVE AND ADAPTIVE CRUISE CONTROL TESTING (781164).....	1903
<i>A. Eilbert, A-M. Chouinard, T. Tiernan, S. Smith</i>	
PFAS - EMISSIONS, TESTING & EXPOSURE I.....	1922
<i>K. Eldridge, S. Zemba, T. McKnight, A. Driscoll, T. Russell, J. Lang, I. Cooper, A. McGrath</i>	

PFAS - EMISSIONS, TESTING & EXPOSURE II	1925
<i>C. Lutes, S. Zemba, A. Black, K. Vijayaraghavan, B. Cosic, R. Beardsley, M. Traister, K. Cooper, J. Wilkinson, E. Wood</i>	
PFAS A NEW EMERGING CONTAMINATE- IMPACT ON INDOOR AIR QUALITY (783884).....	1927
<i>H. Behzadi</i>	
PFAS AND THE EMERGING AIR EMISSIONS NEXUS (794240).....	1936
<i>L. Kemp, A. Horneman, B. Chandramouli</i>	
PFAS AND TRI - WHAT'S ON THE HORIZON (808423)	1957
<i>A. Black</i>	
PHOTOCATALYTIC OXIDATION OF ANAESTHETIC GASES (806531)	1966
<i>S. Srinivasan, C. Moralejo, W. Anderson</i>	
PHOTOCHEMICAL GRID MODELING FOR SINGLE SOURCE PROJECTS AND A COMPARISON TO USEPA'S CO-BENEFITS RISK ASSESSMENT (COBRA) HEALTH IMPACTS SCREENING AND MAPPING TOOL (796269).....	1981
<i>T. Vencill, S. Libicki, R. Morris, E. Lu, M. Keinath, J. Horne, L. Pramod</i>	
PHOTOCHEMICAL GRID MODELING IN HEALTH IMPACT ASSESSMENTS FOR ENVIRONMENTAL REVIEWS (796138)	1988
<i>H. Rous, M. Stewart, J. Westbrook, F. Matamala</i>	
PHOTOCHEMICAL MODELING TO ADDRESS REGIONAL HAZE STATE IMPLEMENTATION PLANS FOR THE WESTERN STATES (790558).....	2001
<i>R. Morris, M. Rodriguez, T. Shah, T. Moore</i>	
PILOTING NEXT-GENERATION SENSOR TECHNOLOGY AT UPSTREAM OIL AND GAS FACILITIES (809428)	2010
<i>K. Craig, R. Moffet, J. Marrero, P. Roberts</i>	
PITFALLS AND UNCERTAINTIES IN MOBILE SOURCE MODEL EVALUATION (809449)	2020
<i>G. Schewe, T. Carlson</i>	
PM DISPERSION IN COYHAIQUE, ONE OF THE MOST POLLUTED CITIES IN THE AMERICAN CONTINENT (809126)	2030
<i>H. Romero, F. Gallardo, L. Diaz-Robles, F. Montecinos</i>	
POLYMERIC SORBENTS FOR AIR PURIFICATION (810381).....	2044
<i>Y. Nazarenko, H. Szeptycki, P. Ariya</i>	
POTENTIAL FOR SUBWAY ENERGY SAVINGS AND EMISSIONS REDUCTIONS BASED ON INTER-RUN VARIABILITY IN SPEED TRAJECTORIES: A CASE STUDY OF BALTIMORE SUBWAY (793214).....	2055
<i>W. Yuan, H. Frey</i>	

VOLUME 4

PROGRESS ON MODELING APPLICATIONS OF SOURCE CHARACTERIZATION TECHNIQUES (808905)	2073
<i>L. Warren, B. Paine</i>	

PROMOTING ELECTRIC VEHICLE CHARGING INFRASTRUCTURE FOR NEW DEVELOPMENTS: CASE STUDIES AND BEST PRACTICES FOR LOCAL JURISDICTIONS (794544)	2085
<i>S. Ulissi, L. Koolik, M. Sutter, M. Keinath</i>	
RE-BALANCING GLOBAL CLIMATE CHANGE STRATEGIES (812570)	2098
<i>E. Duckett</i>	
RECENT REGULATIONS FROM CALIFORNIA TO LONDON – WHAT IS THE IMPACT ON THE AIR QUALITY MONITORING LANDSCAPE? (794838)	2109
<i>S. Boehm</i>	
RECOGNIZING LOCAL DISPARITIES AND IMPROVING AIR QUALITY (811331).....	2115
<i>J. Finkle</i>	
REGIONAL AND GOVERNMENT RESPONSE MITIGATING CLIMATE CHANGE	2126
<i>M. Conrardy, F. Webb, T. McNevin, S. Newman, A. Guha, T. Dinh, D. Fairley, L. Cackette, M. Martien, D. Cusworth, K. Foster, A. Thorpe, R. Duren, M. Fischer, S. Jeong, N. Yesiller, J. Hanson</i>	
AN OVERVIEW OF CALIFORNIA AIR RESOURCES BOARD'S IN-USE OFF-ROAD DEISEL-FUELED FLEET AND HEAVY-DUTY AND EQUIPMENT FLEET REGULATIONS.....	2128
<i>J. King</i>	
REGULATORY MODELING WITH AERMOD	2141
<i>B. Paine, G. Schewe, S. Guerra, A. White, D. Long, J. DeGagne, M. Moreen, J. Connors, C. Warren</i>	
REMOVAL OF ARSENIC IN WATER BY MODIFIED MAGNETIC BIOCHAR (791404).....	2146
<i>J. Chen, C. Chang</i>	
REPRESENTATIVE SAMPLING FOR AIR QUALITY ASSESSMENT FROM A MOBILE SENSING PLATFORM (809935)	2157
<i>K. Hu, J. Jenkins, B. LaFranchi</i>	
EXPLORE EARTH.....	2169
<i>J. Haynes</i>	
DIAGNOSING SYNTHETIC DATA FOR DEMONSTRATING AIR-QUALITY APPLICATIONS OF THE NASA TEMPO MISSION	2177
<i>A. Naeger</i>	
GEOSTATIONARY MEASUREMENTS OF NO2 AND OTHER GASES FROM TEMPO	2187
<i>R. Cohen</i>	
EPIDEMIOLOGIC OPPORTUNITIES	2201
<i>A. Just, D. Carrion, I. Gutierrez-Avila</i>	
NASA'S MULTI-ANGLE IMAGER FOR AEROSOLS	2210
<i>A. Nastan</i>	
REVEALING TEMPO'S CAPABILITY FOR OBSERVING OZONE PRECURSORS	2219
<i>L. Judd</i>	
RISKS TO HEALTH FROM AMBIENT PARTICULATE MATTER (PM _{2.5} AND PM ₁₀) TO THE RESIDENTS OF AN INDIAN CITY: AN ANALYSIS (795731)	2229
<i>A. Dutta, W. Jinsart</i>	

SAMPLING AND ANALYSIS FOR THE CHARACTERIZATION OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) IN STACK GAS (781393).....	2239
<i>T. McKnight, W. Anderson, P. Bales, C. Adkins</i>	
SAN FRANCISCO CITYWIDE HEALTH RISK ASSESSMENT, MODEL UPDATES, AND INTEGRATION WITH POLICY (796324).....	2250
<i>T. Vencill, M. Keinath, J. Range, J. Pollak</i>	
IDENTIFYING PRIORITY CLIMATE ADAPTATION NEEDS FOR SAN JOAQUIN COUNTY'S TRANSPORTATION SYSTEM	2257
<i>E. Berry</i>	
SAOO INNOVATIONPLUS: EMBRACING INNOVATIONS TO MAINTAIN SUPERIOR ENVIRONMENTAL PERFORMANCE (795446).....	2263
<i>E. El-Ayoubi</i>	
SCALE UP CHARACTERIZATION OF FATS, OILS, AND GREASE FOR REUSE AS BIOFUELS (809724)	2269
<i>A. Mata, K. Johnson, M. Lu, A. Helmstetter, A. Garg</i>	
SELECTION OF SURFACE CHARACTERISTICS FOR DISPERSION MODELING ANALYSES IN AERMOD: IMPACT OF METHODOLOGY AND CHANGES IN CLIMATE AND LAND USE (809884)	2279
<i>J. DeGagne, M. Moreen</i>	
SENSOR TECHNOLOGY	2290
<i>O. Samani, T. Dye, K. Craig, D. Lu, D. Riallant, G. Shpitzer</i>	
SITE INVESTIGATION, LEGAL, ANALYTICAL, TOXICOLOGICAL AND PRODUCT STEWARDSHIP CHALLENGES POSED BY PFAS (808826).....	2293
<i>M. Traister, J. Fenstermacher, J. Grachuk, M. Maier, D. Kmetzo, L. Dell, D. Kay</i>	
SMART COMBUSTION™ TO MINIMIZE AIR POLLUTION (807557)	2295
<i>C. Baukal, N. Russell, R. Forest, E. Gebhard, C. Carroll</i>	
SOURCE ATTRIBUTION EMISSION REDUCTION VS OZONE; MODELING STUDIES (784430)	2312
<i>S. Collet, T. Kidokoro, T. Yamada, T. Yamashita, P. Karamchandani, T. Shah</i>	
SPENT COFFEE GROUND BIOCHAR FOR SELECT HEAVY METAL REMOVAL (809587)	2327
<i>J. Liu, M. Lu, Y. Zhou, S. Srivastava, D. Xu, E. Williams, G. Schwein</i>	
STANDARDIZE CODE TABLES FOR A COMBINED AIR EMISSION REPORTING SYSTEM (807374)	2337
<i>C. Wu, J. Gamas, J. Wang, B. Way, K. Poole</i>	
STANDARDIZING IMPACT REPORTING FOR THE GREEN BOND MARKET: ENVIRONMENTAL PERFORMANCE INDICATORS (810193).....	2348
<i>J. Bede, J. Finsden</i>	
STARTUP AND SHUTDOWN AIR PERMIT LIMIT DEVELOPMENT FRAMEWORK FOR COMBUSTION SOURCES MONITORED BY CONTINUOUS EMISSION MONITORING SYSTEMS (794993)	2355
<i>A. Shivkumar, S. Gregory, E. Suess, D. Suess</i>	

SULFUR DIOXIDE AND PARTICLES (PM10) AIR QUALITY IN A PORT LOCATED ON THE GULF OF MEXICO (795694)	2377
<i>R. Echeverria, A. Retama, P. Alvarez</i>	
TERPENES DETECTION AND SAMPLING IN AIR, BY COMBINING TRADITIONAL TECHNOLOGIES AND NEW REAL TIME MONITORING BY USING PTR-MS (783870).....	2392
<i>H. Behzadi</i>	
THE CHANGING LANDSCAPE OF AIR QUALITY MEASUREMENTS NEAR INDUSTRIAL SOURCES AND REPORTING IN REAL TIME (809831)	2402
<i>P. Roberts</i>	
IMPLEMENTING REFINERY AIR QUALITY FENCELINE MONITORING PROGRAMS.....	2403
<i>C. MacDonald</i>	
SCAQMD RULE 1180 FENCELINE AIR MONITORING.....	2413
<i>T. Rau</i>	
THE COMBINED AIR EMISSIONS REPORTING (CAER) SYSTEM (809338).....	2420
<i>J. Gamas, T. Manning, S. Knapp</i>	
THE HOT AND COLD OF REFRIGERANT MANAGEMENT REQUIREMENTS UNDER THE CLEAN AIR ACT (835127)	2430
<i>L. Corio</i>	
THE HUMAN EXPOSURE MODEL, VERSION 4 (HEM4) (788304)	2442
<i>T. Palma, M. Morris, D. Smith, S. Fudge, C. Stolte, D. Lindsey, J. Mozier</i>	
THE INDUSTRIAL-SCALE CULTIVATION OF CANNABIS AND ITS IMPACT ON REGIONAL OZONE (794928).....	2454
<i>W. Vizuet</i>	
THE PLACE OF “PORTABLE SENSORS” IN THE AIR QUALITY MONITORING VALUE CHAIN (793900).....	2465
<i>D. Riallant</i>	
THE REDUCE, REUSE AND REPAIR MICROGRANT PROGRAM IN NEW YORK CITY (829846)	2477
<i>M. Clarke</i>	
THE SPORECAM™ - AN AUTONOMOUS SPECTROMETER FOR AMBIENT AIR MONITORING (809053).....	2485
<i>P. Manautou, B. O'Neil, D. Pilsworth, G. Wanke</i>	
THE TRANSITIONING ELECTRIC POWER SECTOR (837311).....	2491
<i>J. Kinsman</i>	
TITLE V IMPLEMENTATION – ISSUES AND CHALLENGES (807460)	2505
<i>C. Campbell</i>	
TITLE V PETITION PROCESS	2508
<i>C. Ellis</i>	
LOCOMOTIVE FUEL USE AND EMISSION RATES	2519
<i>N. Rastogi, H. Frey</i>	

TRANSPORTATION: MODELING AND EMISSIONS.....	2539
<i>R. Wayson, G. Bou-Saab, T. Wei, H. Frey, W. Yuan, L. Salamen, D. Jawad, G. Schewe, T. Carlson, Y. Yu, S. Xiang, K. Noll</i>	
TREATMENT OF ODORS GENERATED IN A LANDFILL: A SCHEME TO CONCENTRATE H ₂ S EMISSIONS (795807).....	2541
<i>G. Cohen, A. Hassan, Dvorak, M. Al-Faliti</i>	
TURNING REFUSE DERIVED FUEL INTO A VIABLE ALTERNATIVE: THE CASE OF LEBANON (808930)	2551
<i>I. El Khoury, S. Ghanimeh</i>	
UNCERTAINTY EPA HAS CREATED WITH NEW NSPS XXX AND CF RULES (809664).....	2565
<i>G. Stephens, C. Drotman, P. Sullivan</i>	
UNDERSTANDING THE ATMOSPHERIC BOUNDARY LAYER IN COMPLEX TERRAIN WITH RADIOSONDE, SODAR, RASS, AND TOWER DATA (788284)	2574
<i>A. Sadar, J. Maranche</i>	
UPCOMING MACT RESIDUAL RISK AND TECHNOLOGY REVIEWS - WHAT TO EXPECT AND LESSONS LEARNED FROM THE REFINERY SECTOR RULE (RSR) (795906).....	2585
<i>T. Widboom, P. Fish, N. Kowalsky</i>	
UPDATES AND IMPROVEMENTS MADE TO US EPA'S WEBFIRE DATABASE (794756).....	2605
<i>C. Bray, M. Ciolek, M. Ali, D. Greene, H. Zhou, J. Renzaglia</i>	
USE OF PROGNOSTIC METEOROLOGICAL DATA IN THE SHENANDOAH VALLEY (808876)	2612
<i>S. Guerra, A. White</i>	
LOCALLY DEVELOPED LOW COST PARTICULATE MATTER SENSORS FOR MODELING PM _{2.5} IN UGANDA.....	2628
<i>E. Coker, J. Ssematimba</i>	
USING LOW-COST PERSONAL MONITORS TO DEVELOP A SPATIOTEMPORAL LAND USE REGRESSION MODEL FOR BLACK CARBON IN DENVER, CO (805013).....	2643
<i>S. Martenies, S. Magzamen, S. WeMott, W. Allshouse, J. Adgate, A. Starling, D. Dabelea</i>	
USING UNMANNED AERIAL SYSTEMS (UAS - DRONES) TO MEASURE NOX EMISSIONS FROM STATIONARY SOURCES (794847).....	2651
<i>P. Clark, J. Richardson</i>	
UTILIZING DATA VISUALIZATION SOFTWARE TO MEET GREENHOUSE GAS REDUCTION TARGETS (809852)	2661
<i>B. Sewell, B. Schuster, J. Caton, C. Easter</i>	
VALUATION OF GLOBAL DATA ASSIMILATION SYSTEM (GDAS) ATMOSPHERIC STABILITY FORECAST DATA USAGE ON SHORT TERM PM _{2.5} PREDICTIONS (795735).....	2669
<i>G. Ormanova, E. Zhumabayeva, F. Karaca</i>	
VAPOR INTRUSION AND REMEDIATION.....	2681
<i>C. Lutes, P. Ruehl, M. Plate, A. Lee, L. Abreu, B. Schumacher, J. Zimmerman, A. Williams, C. Lutes, L. Lund, M. Bedan, J. Lowe, P. Hatzinger, M. Lu, K. Zhou, J. Xu</i>	
VIABILITY OF ELECTRIC VEHICLES IN THE LOGISTICS/TRANSPORTATION INDUSTRY (808617)	2684
<i>A. Sako, E. Hsiung, T. Witwer</i>	

WEB SERVICES TO IMPROVE EMISSIONS INVENTORY DATA COLLECTION FOR STATIONARY SOURCES (809123)	2701
<i>M. Houyoux, J. Drukenbrod, K. Patel, E. Goehl, M. Ciolek, N. Spaeth, T. Wible</i>	
WHAT HAVE WE LEARNED FROM THE FIRST YEAR OF REFINERY FENCELINE AND COMMUNITY MONITORING IN CALIFORNIA? (810003).....	2713
<i>J. Marrero, P. Roberts, R. Moffet, C. MacDonald</i>	
WHERE SUSTAINABILITY AND COMPLIANCE INTERSECT - A HOLISTIC VIEW OF COMPLIANCE RISK PLANNING (807709)	2724
<i>F. Skiba</i>	
WHITE PAPER ISSUES FOR AERMOD – WHERE ARE WE IN 2020? (809964).....	2732
<i>B. Paine, J. Connors, C. Warren</i>	
WILDLAND FIRES PROJECTIONS IN THE CHANGING FUTURE REGIONAL CLIMATE (809334)	2746
<i>C.-E. Yang, J. Fu, X. Dong, Y. Liu, Y. Liu</i>	
WORKING WITH YOUTH FOR LONG-TERM GOVERNMENT SUSTAINABILITY (808372)	2751
<i>K. Chu, R. Trinidad</i>	
ZERO MUNICIPAL SOLID WASTE MANAGEMENT FRAMEWORK THAT INTEGRATES REUSABLE PACKAGING THROUGH CENTRALIZED RECOVERY (809993)	2756
<i>M. Morrow</i>	

Author Index