

**Projects Supported by the Water Research Foundation During 2020
Relevant to the Metropolitan Water Reclamation District of Greater Chicago**

- 1 Project 5105 Advancing Benefits and Co-Benefits Quantification and Monetization for Green Stormwater Infrastructure: An Interactive Guidebook for Utilities and Municipalities - \$75,000
- 2 Project 5101 Real Time Carbon Management of Water Resource Recovery Facilities using In-Situ Bio-Electrochemical Sensors - \$175,000
- 3 Project 5100 Rapid Detection and Quantitation of Active Microorganisms - \$170,000
- 4 Project 5099 Mainstream Deammonification with Biological Phosphorus Removal - D - \$105,000
- 5 Project 5098 Mainstream Deammonification with Biological Phosphorus Removal - C - \$249,670
- 6 Project 5097 Mainstream Deammonification with Biological Phosphorus Removal - B - \$250,000
- 7 Project 5096 Mainstream Deammonification with Biological Phosphorus Removal - A - \$250,000
- 8 Project 5095 Mainstream Deammonification with Biological Phosphorus Removal - \$0
- 9 Project 5094 SARS-CoV-2 Wastewater Surveillance NSF RCN - \$15,000
- 10 Project 5093 Understanding the Factors That Affect the Detection and Variability of SARS-CoV-2 in Wastewater - \$300,000
- 11 Project 5091 Developing a Framework for Quantifying Energy Optimization Reporting - \$100,000
- 12 Project 5089 Interlaboratory and Methods Assessment of the SARS-CoV-2 Genetic Signal in Wastewater - \$200,000
- 13 Project 5088 Defining Exposures of Microplastics/Fibers (MPs) in Treated Waters and Wastewaters: Occurrence, Monitoring, and Management Strategies - \$225,000
- 14 Project 5087 Driving Implementation of Innovative and Efficient Biological Nutrient Removal Processes through Improvement of Control Systems and Relevant On-line Analytical Measurement Reliability Accuracy - \$100,000
- 15 Project 5086 Case Studies on Management of Cross-sector Dependencies - \$200,000
- 16 Project 5084 Holistic and Innovative Approaches for Flood Mitigation Planning and Modeling under Extreme Wet Weather Events and Climate Impacts - \$100,000
- 17 Project 5083 Advancing Low Energy Biological Nitrogen and Phosphorus Removal - \$200,000
- 18 Project 5082 Investigation of Alternative Management Strategies to Prevent PFAS From Entering Drinking Water Supplies and Wastewater - \$350,000
- 19 Project 5078 Linking Nutrient Reductions to Receiving Water Responses - \$150,000
- 20 Project 5075 Urban Stormwater BMP Database Update for 2020-2021 - \$75,000
- 21 Project 5074 Evaluating Utility staff training to Improve Knowledge Retention - \$100,000
- 22 Project 5072 Mitigation Strategy Plan for Direct Greenhouse Gas Emissions from BNR Processes in New York City - \$100,000
- 23 Project 5071 Demonstration of Progressive Carbon Efficient Nitrogen with Biological Phosphorous Removal in a Conventional BNR Facility - \$200,000
- 24 Project 5062 A Distributed Renewable Energy Opportunities and Workshop - \$25,000
- 25 Project 5060 QAQC Lab Pathogen Project - \$37,000
- 26 Project 5058 Summary of Opportunities for the Water Sector to Advance Integrated and Climate Resilient Infrastructure Management - \$5,000
- 27 Project 5056 Test and Enhance Water Utility Business Risk and Opportunity Framework and Guidebook - \$59,610
- 28 Project 5055 Biosolids Research Roadmap Workshop - \$50,000
- 29 Project 5052 Standardizing Methods with QA/QC Standards for Investigating the Occurrence and Removal of Antibiotic Resistant Bacteria/Antibiotic Resistance Genes (ARB/ARGs) in Surface Water, Wastewater, and Recycled Water - \$200,000
- 30 Project 5047 Guidelines for the Demonstration of Pathogen Log Removal Credits in Wastewater Treatment - \$80,000
- 31 Project 5045 Biogas Harvester Pilot Test - \$66,516
- 32 Project 5044 Modernizing the Biological Nutrient Removal Monitoring Tool Kit - \$44,074
- 33 Project 5042 Assessing Poly- and Perfluoroalkyl Substance Release from Finished Biosolids - \$104,000

34 Project 5041 Enteric Virus Log Removal in Wastewater Treatment for Potable Reuse - \$75,000

35 Project 5039 Definition of a Smart Utility - How to Be a Digital Utility and the Framework for an Intelligent Water System - \$75,000

36 Project 5038 2019 Roadmap Workshop on Prioritizing Permitting and Linkages Research in Water Quality - \$75,000

37 Project 5037 Evaluation of Existing Source Separated Organic Feedstock Pre-Treatment and Management Practices - \$150,000

38 Project 5036 Technical Brief: Compounds of Current and Future Interest and Implications for One Water - \$75,000

39 Project 5034 Assessing the Microbial Risks and Potential Impacts from Stormwater Collection and Uses to Establish Appropriate Best Management Practices - \$75,000

40 Project 5031 Occurrence of PFAS Compounds in US Wastewater Treatment Plant - \$250,000

41 Project 5030 New Approaches for Improved Nutrient Management-Workshop - \$50,000

42 Project 5029 Environmental Persistence and Disinfection of Lassa Virus and SARS-CoV-2 to protect Worker and Public Safety - \$85,987

43 Project 5028 Fate of Antibiotic Resistance Genes ARGs and Antibiotic Resistant Pathogens in Full-Scale Activated Sludge Processes and the Optimization of Activated Sludge Processes for Reducing ARGs - \$144,102

44 Project 5027 Partial Denitrification Anammox as Alternative Pathway to Achieve Mainstream Short-Cut Nitrogen Removal - \$147,161

45 Project 5017 Florida Power and Light: Peer Review Proposal - \$46,100

46 Project 5012 Enhancing the International Stormwater BMP Database to Serve as a Highway Specific BMP Database - \$80,000

47 Project 5011 ESTCP PFASs Groundwater - \$99,0451

48 Project 5004 Demonstrating the CalPrex System - \$75,000

49 Project 4998 Risk Benefit Assessment of Chlorite as a Co-Disinfectant for Nitrification Control in Chloraminated Drinking Water Systems - \$150,000

50 Project 4996 Co-Digestion of Organic Waste-Addressing Operational Side-effects - \$25,3022

51 Project 4994 Follow-Up Efforts on Urban Planning and Water Management - \$3,000

52 Project 4992 Low Molecular Weight Unknown Compounds - \$32,000

53 Project 4989 Measure Pathogens in Wastewater - \$174,900

54 Project 4988 Pathogen Prescreening Method Optimization Study - \$24,500

55 Project 4984 Impact of Intermittent Operation on Biofilter Performance - \$196,980

56 Project 4982 Strategic Workforce Plan and Employee Value Proposition - \$41,271

57 Project 4980 Toolkit to Communicate Technical Findings to a Non-Expert Audience - \$80,000

58 Project 4978 Application of Big Data for Energy Management at Water Utilities - \$50,000

59 Project 4976 New Approaches for Reduced Aeration Energy Plus Nutrient Removal - \$30,000

60 Project 4975 Practices to Enhance Internal Fermentation - \$125,000

61 Project 4974 New Regulatory Approaches for Improved Nutrient Removal - \$150,000

62 Project 4973 Guidelines for Optimizing Nutrient Removal Plant Performance - \$130,000

63 Project 4972 Expanding the Use of Wastewater Epidemiology Tools to Identify Population within Service Area under Stress and Explore Potential to Affect Change - \$200,000

64 Project 4971 Leveraging the Role of Pretreatment Programs in One Water Initiatives: Synthesis of Best Practices and Path Forward - \$100,000

65 Project 4968 Annual Update of International Stormwater BMP Database and Expanding Communication on the Database - \$85,000

66 Project 4965 Development of a Community-Based Lead Risk and Mitigation Model - \$2,042,031

67 Project 4961 The Use of Next Generation Sequencing (NGS) and Metagenomics Approaches to Evaluate Anti-Microbial Resistance, Plant Challenge, Biological Removal Processes - \$300,000

68 Project 4952 Pathogen Research - \$618,600

69 Project 4951 Quantitative Microbial Risk Assessment Implementation - \$200,000

70 Project 4941 Multi-Objective Evolutionary Algorithm Application Guidance for Utility Planning - \$180,000

71	Project 4940 Peer Review on Metagenomics for MWRDGC - \$50,000
72	Project 4936 Determining the Fate and Major Removal Mechanisms of Microplastics in Water and Resource Recovery Focus Area Facilities (Compounds of Emerging Concern/Trace Organics) - \$25,000
73	Project 4920 Decision Support Framework for Drinking Water Treatment Plants Experiencing Lake Recovery - \$215,000
74	Project 4915 Characterization and Contamination Testing of Source Separated Organic Feedstocks and Slurries for Co-Digestion at Resource Recovery Focus Area Facilities - \$390,000
75	Project 4907 Leading Water Utility Innovation - \$450,850
76	Project 4904 Full Scale Validation of Cryptosporidium and Giardia Log Reduction in Secondary Biological Treatment - \$49,810
77	Project 4902 Leveraging Big-Data and Deep Learning for Economical Condition Assessment of Wastewater Pipelines - \$150,000
78	Project 4901 Combining Nitrite Stunt Anammox Process with the Sidestream Enhanced Biological Phosphorous Removal (EBPR) Process for Simultaneous and Sustainable Nitrogen and Phosphorous Removal - \$136,099
79	Project 4900 Unlocking the Potential of Mixed-Microbial Fermentation for Enhancing Carbonaceous Resource Recovery from organic "Wastes" - \$138,447
80	Project 4892 Characterizing the Quality of Biogas Derived from Wastewater Solids Codigested Organic Wastes and Other Digestion Enhancements - \$100,000
81	Project 4884 Estimating the Comammox Contribution to Ammonia Oxidation in Nitrogen Removal Systems - \$122,764
82	Project 4882 Phase-3 Development of Wastewater Pipeline Deterioration Model - \$142,500
83	Project 4876 Next Generation Anaerobic Membrane Bioreactor for Low Temperature Domestic Wastewater Treatment: Pilot - \$163,294
84	Project 4871 Nationwide Meta-Omics Survey of Anaerobic Digestion and Fermentation Processes for Resource Recovery from Biosolids and Other Organics - \$151,576
85	Project 4870 Balancing Flocs and Granules for Activated Sludge Process Intensification in Plug Flow Configurations - \$118,926
86	Project 4868 Knowledge Gap Analysis for Plant Uptake Models - \$34,000
87	Project 4866 Biofilm-Enhanced Anaerobic Membrane Bioreactor for Low Temperature Domestic Wastewater Treatment - \$15,000
88	Project 4865 Advancing the Oxygenic Photogranule Process for Energy Positive Wastewater Treatment - \$15,000
89	Project 4864 Bioaugmentation of Activated Sludge with High Activity Nitrifying Granules/Flocs: Population Selection, Survival, Biokinetics - \$130,000
90	Project 4863 Hybrid Anaerobic Primary and Secondary Treatment with Energy Recovery - \$101,593
91	Project 4852 Framework and Tools for Quantifying Green Infrastructure Co-Benefits and Linking with Triple Bottom Line Analysis - \$149,785
92	Project 4849 Exploring Designated Uses to Support Water Quality Compliance - \$50,000
93	Project 4847 Follow-Up Effort on AgBMP Database - \$40,000
94	Project 4842 Enhancement of Resilience to Extreme Weather and Climate Events - \$50,000
95	Project 4841 Exploratory Effort of Pathways for Stormwater Harvesting - \$20,000
96	Project 4839 Annual Update of International Stormwater BMP Database (Urban Component) - \$89,984
97	Project 4837 Incorporating Forestry into Stormwater Management Programs: State of the Science and Business Model Evaluation for Nutrient Reduction and Volume Control - \$99,984
98	Project 4833 Impact of Wastewater Treatment Performance on Advanced Water Treatment Processes and Finished Water Quality - \$300,000
99	Project 4826 Towards Innovation-Stimulating Regulations-Nutrient Regulations: A Global Perspective with Implications for the United States - \$125,000
100	Project 4825 - \$
101	Project 4824 Plasmids and Rare Earth Elements from Wastewater - \$56,307
102	Project 4818 Testing a Biofloc Model to Understand Dewatering and Solve Dewaterability Issues Related to Resource Recovery - \$205,000
103	Project 4816 Nutrient Recovery Through Urine Separation - \$44,989

- 104 Project 4815 Modeling Guidance for Developing Site Specific Nutrient Goals - Demonstration, Screening-Level Application - \$150,000
- 105 Project 4814 Evaluation of Data Needs for Nutrient Target-Setting Using the Nutrient Modeling Toolbox - \$249,232
- 106 Project 4813 A Critical Review and Evaluation of Antibiotic Resistance in the Wastewater Environment - A Risk Assessment - \$140,000
- 107 Project 4803 LCASW6SG16 Community-Enabled Lifecycle Analysis of Storm Water Infrastructure Costs - \$9,501
- 108 Project 4802 LCASW5SG16 Community-Enabled Lifecycle Analysis of Storm Water Infrastructure Costs - \$150,000
- 109 Project 4801 LCASW4SG16 Community-Enabled Lifecycle Analysis of Storm Water Infrastructure Costs - \$225,000
- 110 Project 4800 LCASW3SG16 Community-Enabled Lifecycle Analysis of Storm Water Infrastructure Costs - \$294,968
- 111 Project 4799 LCASW2SG16 Community-Enabled Lifecycle Analysis of Storm Water Infrastructure Costs - \$500,498
- 112 Project 4798 LCASW1SG16 Community-Enabled Lifecycle Analysis of Storm Water Infrastructure Costs - \$454,643
- 113 Project 4797 Designing Sensor Networks and Locations on an Urban Sewershed Scale with Big Data Management and Analytics - \$200,000
- 114 Project 4792 Developing Business Cases for Food Waste Co-Digestion at Water Resources Recovery Focus Area Facilities - \$132,400
- 115 Project 4774 Molecular Methods for Measuring Pathogen Viability/Infectivity - \$349,794
- 116 Project 4771 Characterization and Treatability of TOC from DPR Processes Compared to Surface Water Supplies - \$400,000
- 117 Project 4770 Scorecard for Evaluating Opportunities in Industrial Reuse - \$200,000
- 118 Project 4760 Establishing Additional Log Reduction Credits for WWTPs - \$400,000
- 119 Project 4755 HYPOWERS: Hydrothermal Processing of Wastewater Solids - \$8,239,459
- 120 Project 4753 Development of Innovative Project Delivery Strategies - \$78,143
- 121 Project 4743 Optimizing Filter Backwashing Practices to Reduce Selection for Opportunistic Pathogens in Drinking Water - \$200,000
- 122 Project 4742 Probability Management for Water Finance and Resource Managers - \$220,000
- 123 Project 4734 Real-life Enterprise Resilience - \$160,000
- 124 Project 4729 Mapping Climate Exposure and Climate Information Needs to Utility Business Functions - \$110,000
- 125 Project 4718 Battery Storage System Guidance for Water and Wastewater Utilities - \$110,000
- 126 Project 4717 Innovative Technologies to Effectively Manage Deteriorating Infrastructure - \$150,000
- 127 Project 4668 Managing Water and Wastewater Utility Data to Reduce Energy Consumption and Cost - \$260,000
- 128 Project 4666 Case Study Compilation on Applying Risk Management Principles and Innovative Technologies to Effectively Manage Deteriorating Infrastructure - \$250,000