AECOM Delivering a better world

2020-2021 Environment Webinar Series

SUSTAINABLE DEVELOPMENT & STRENGTHENING RESILIENCE

IMPROVING SOCIAL OUTCOMES

ACHIEVING NET-ZERO CARBON EMISSIONS

ENHANCING GOVERNANCE

Sustainable Development and Strengthening Resilience

PFAS Tools and Technologies

We hope you find this three-part webinar series on Per- and Polyfluoroalkyl Substances (PFAS) informative. Our leaders in the field have managed hundreds of PFAS-related projects for clients around the world and at more than 200 PFAS sites in North America.

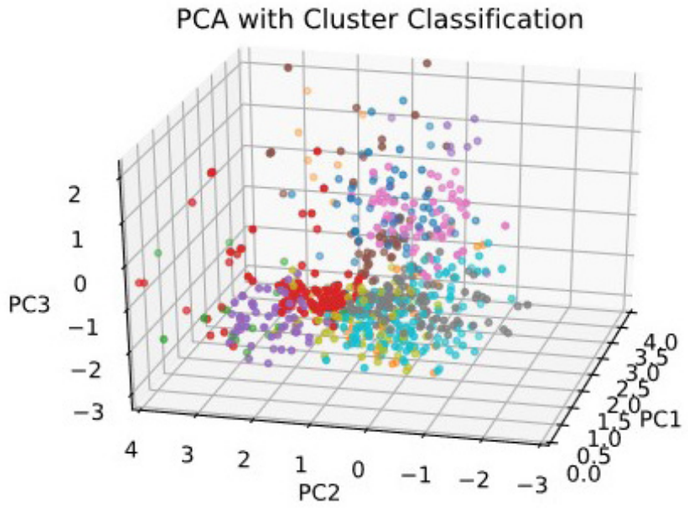
PFAS
IDENTIFY. RESOLVE.

PFAS Chemometrics as a Forensic Tool

Zachary Neigh, MS
Chemist
zachary.neigh@aecom.com

View Recording

Mr. Neigh presents robust methods of exploratory data analysis and classification applied to PFAS chemical analytical results from environmental media for forensic evaluation. Chemometric pattern recognition can be used successfully as a forensic tool to identify PFAS source signatures and provide insight into environmental fate and transport behavior.



Fate & Transport in Groundwater

Mahsa Shayan, Ph.D, P.Eng.
Environmental Engineer
mahsa.shayan@aecom.com

Dr. Shayan discusses the challenges in developing fate and transport models for PFAS contaminated sites because of the complexity and range of behaviors across the class of contaminants. Improved fate and transport knowledge will aid in apportioning mass removal processes that control PFAS distribution based on site-specific conditions.

View Recording

DE-FLUORO™ PFAS Destruction Technology

Shangtao Liang, Ph.D.,
Environmental Engineer,
shangtao.liang@aecom.com

Rebecca Mora, Senior
Environmental Engineer
rebecca.mora@aecom.com

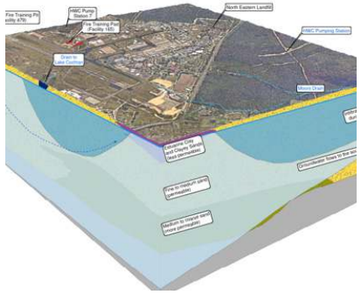
Members of our DE-FLUORO™ Technical Development Team present information on this proprietary PFAS destruction technology. They will focus on the DE-FLUORO™ technology evolution, results of bench and pilot testing, progress on field demonstration, and the application scenarios of the technology.

DE-FLUORO™

PFAS - Large Scale Remediation Progress

Paul McCabe
Technical Director
Geosciences & Remediation
paul.mccabe@aecom.com

Mr. McCabe's presentation summarizes progress in one of Australia's largest and most complex PFAS remediation projects with multiple management and remediation elements. We also present evidence of significant reduction of a groundwater PFAS plume following a combination of soil removal and pump & treat remediation at a key source area.



Human Health and Ecological Risks

Sagar Thakali, Ph.D
Principal Risk Assessor
sagar.thakali@aecom.com

Dr. Thakali shares the current trends and a look to the future in assessing the human health and ecological risks of PFAS. This will include current regulatory drivers, the significance of conceptual site models, exposure pathways, and trends in health and ecological risk assessments.

View Recording

PFAS Considerations and Technologies for Water Utilities

This continuation of our PFAS webinar series focuses on considerations related to how water utilities can develop effective strategies and help manage PFAS implications within their facilities.

PFAS IDENTIFY. RESOLVE.

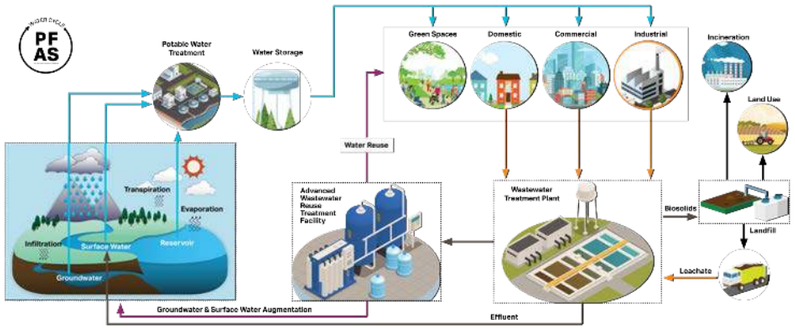
Drinking Water Strategies and Life-cycle Management Considerations

Chris Curran, P.E.
Associate Vice President
Water PFAS Lead
chris.curran@aecom.com

William Clunie, P.E., BCEE
Technical Leader, Water
william.clunie@aecom.com

View Recording

Mr. Curran and Mr. Clunie share case studies that provide insight on how to optimize treatment approaches and use emerging technologies to evaluate source water quality, PFAS characteristics, waste management and overall water system dynamics help to position water purveyors with the most sustainable approach. We also review utility management challenges including implementation and funding strategies.



Fate of PFAS through Wastewater Facilities and Planning for Regulatory Impacts

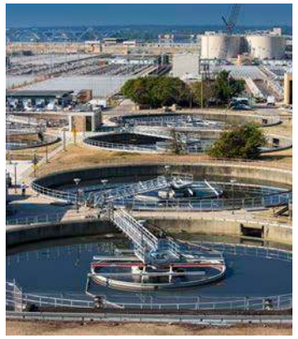
Dorin Bogdan, Ph.D.,
Michigan PFAS Lead
dorin.bogdan@aecom.com

Terry Goss, P.E.
Biosolids Practice Leader, Water
terry.goss@aecom.com

Vijay Sundaram, Ph.D., P.E.
National Water Reuse Technical Practice Leader
vijay.sundaram@aecom.com

View Recording

Dr. Bogdan shares the current state of knowledge on PFAS impacts and the fate within wastewater treatment plants through the review of the largest statewide PFAS study. Mr. Goss reviews the current state of the practice regarding biosolids management and processes and discusses potential treatment options being promoted for PFAS laden biosolids. Dr. Sundaram shares information on removal of PFAS compounds during tertiary filtration, wastewater disinfection, and other advanced treatment processes. This includes considerations for wastewater reuse applications.



Industrial Source Control, Wastewater Pretreatment

Lucy Pugh, P.E., BCEE
Industrial Wastewater Technical Practice Director
lucy.pugh@aecom.com

Ms. Pugh explores the challenges of managing PFAS in an industrial setting, including source identification and wastewater management strategies.

View Recording

Process Modeling of PFAS

Mehran Andalib, Ph.D., P.E. P.Eng., BCEE, Wastewater Technical Practice Lead
mehran.andalib@aecom.com

Dr. Andalib presents a mathematical model as an extended matrix to Barker-Dold Activated Sludge model (BioWin), to simulate the fate of PFAS and PFAS precursors in a wastewater treatment process. In this model, five new state variables and six reactions are defined to incorporate adsorption, degradation and conversions of different PFAS components in a wastewater process.

Keeping Up With Coal Ash

As a means to connect and engage with you on the many developments in the dynamic CCR marketplace, AECOM hosted a microburst of presentations through a 9-Part "Keeping Up With Coal Ash" Webinar Series. We assembled a group of great speakers on various topics of current interest to the CCR community from AECOM and others.

Stop the Insanity! Changes in the CCR Regulatory Framework and What it Means for You


John Priebe
john.priebe@aecom.com

Mark Rokoff

View Recording

Seeing is Believing! Using Environmental Visualization Systems (EVS) to Maximize Value on CbR/Beneficial Use Closures

Jay Mokotoff
jay.mokotoff@aecom.com

View Recording

Good Enough to Drink!?! – Creative Remedial Approaches That Can Benefit You!

Lewis Davies
joe.davies@aecom.com

View Recording

Now You See it…Now You Don't! Creative Marketplace Approaches from Ponded Ash to Beneficial Use

Gabe Lang
gabe.lang@aecom.com

View Recording

Open up the Aperture and see THE project – Integrated Facility Closure

Rick Brannon
rick.brannon@aecom.com

View Recording

The Best Defense is a Strong Offense! What's New in the CCR Legal World?... and Why I Need to Know What's Coming!

Josh More, Schiff Hardin LLP
jmore@schiffhardin.com

NOT AVAILABLE

Straight talk with Steven Cook: Answers on CCR Rules from the U.S. EPA

Steven Cook, U.S. EPA

View Recording

Getting the Dirt Out of Creative Closure Solutions: A Closure Turf Case Study

David Irwin
david.irwin@aecom.com

View Recording

Keeping Up With Coal Ash

As a means to connect and engage with you on the many developments in the dynamic CCR marketplace, AECOM hosted a microburst of presentations through a 9-Part "Keeping Up With Coal Ash" Webinar Series. We assembled a group of great speakers on various topics of current interest to the CCR community from AECOM and others.

No Longer in the Dark - Using Business Intelligence to Inform and Shape Strategy in a Dynamic World


John Priebe
john.priebe@aecom.com

Mark Rokoff

View Recording

Do I Really Get Captain America's Shield? Explaining a Permit Shield and What It REALLY Means for You

Tony Hopp
Steptoe & Johnson LLP
ahopp@steptoe.com

View Recording

Freeing Yourself from those Pesky Pond Closure Nightmares – Engineering Best Practices for Safety (Design through Post-Closure)

Kula Kulasingam
kula.kulasingam@aecom.com

View Recording

Worth the Wait: Presenting the ELG and CCR Rules in a Way that Makes Sense

Jack Waggener, PE
jack.waggener@aecom.com

View Recording

Pivot to Groundwater: Positioning for GW Remediation From Site Conceptual Models to Corrective Actions


Doug Gray, CGWP
doug.gray@aecom.com

Dennis Connair, CPG, PG
dennis.connair@aecom.com

View Recording

The End of Social Distancing - Tricks of the Trade for Effective Stakeholder Engagement

John Konkus
john.konkus@aecom.com

View Recording

More Straight Talk from the U.S. EPA

Steven Cook and
Richard Huggins, US EPA

View Recording

Polishing Your Crystal Ball: Energy and Environmental Policy Outlook in an Ever-Shifting Political Landscape

John Ward, John Ward Inc.
wardo@wardo.com

View Recording

Remedial Process Optimization - Higher Efficiency and Lower Cost

Joseph Luty, PE
joseph.luty@aecom.com

Venus Sadeghi, PhD
venus.sadeghi@aecom.com

View Recording

REMEDIAL PROCESS OPTIMIZATION: AN OVERVIEW OF APPROACHES AND RESULTS

Remedial Process Optimization is the systematic evaluation and enhancement of site remediation processes to ensure that human health and the environment are being protected over the long term at minimum risk and cost. During this presentation, Mr. Luty will present an overview of approaches to RPO and summarize several examples of results where cost, risk and/or project schedule were minimized.

REMEDIATION SYSTEM OPTIMIZATION AT AIR FORCE PLANT 44 IN TUCSON, ARIZONA

Since 2012, Dr. Sadeghi has been involved with RPO activities at Air Force Plant 44 (AFP44), part of the Tucson International Airport Area Superfund Site. The groundwater at AFP44 is contaminated with a mix of chlorinated VOCs, as well as the emerging contaminant, 1,4-dioxane. A groundwater treatment system using advanced oxidation process has been operating at the site since 2009, and AECOM took over site environmental and RPO activities in 2012. RPO measures implemented include *in situ* bioremediation at source areas and optimization of the groundwater treatment system, including the injection and extraction well network and system infrastructure. These RPO measures have expedited achievement of the remedial action objectives for the site.

One Year Later – An Assessment of the Canada Impact Assessment Act

View Recording

PANELISTS

Marc Rose
marc.rose@aecom.com

Shawna Kjartanson
shawna.kjartanson@aecom.com

Sarah Palmer
sarah.palmer@aecom.com

Robin Reese
robin.reese@aecom.com

Lawrence Baxter
Marten Falls First Nation / Première Nation de Marten Falls
lawrencebax@gmail.com

Jennifer Bruin
Bruin Associates
jennifer@jbruinassociates.com

Rodney Northey
Gowling WLG
rodney.northey@gowlingwlg.com

The Liberal Government introduced the Impact Assessment Act in the summer of 2019 with the promise of improving the approvals process for major infrastructure projects. For project proponents, the Act was intended to create greater regulatory certainty and legislated approval timelines. For Indigenous communities and the public, the Act proposed increased opportunities for engagement and involvement, and consideration of key public policy issues such as climate change. One year later, a handful of major infrastructure projects have begun the approvals process under the new Act. Using these projects as a benchmark, this webinar seeks to answer whether the Act has lived up to the Government's expectations.

1,4-Dioxane *In Situ* Remediation: Conventional and Innovative Solutions

View Recording

Rebecca Mora
rebecca.mora@aecom.com

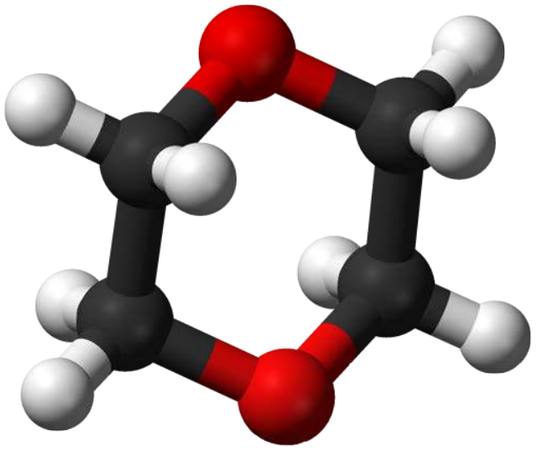
Dustin Bytautas, PE
dustin.bytautas@aecom.com

Enhanced *In Situ* Biodegradation of 1,4-Dioxane

1,4-Dioxane is a probable human carcinogen and an emerging contaminant in groundwater at many military and industrial sites. Numerous studies provide evidence that 1,4-dioxane can be biodegraded aerobically and several cases have documented both metabolic and cometabolic 1,4-dioxane biodegradation since the early 1990s. However, enhanced *in situ* biodegradation efforts have been limited by inconsistent microbial performance in the field. Pseudonocardia dioxanivorans CB1190 (CB1190) is a monooxygenase-expressing microorganism that has been shown to metabolically degrade 1,4-dioxane as a source of carbon and energy in bench-scale and pilot-scale *ex situ* reactors. This technology field demonstration project evaluated bioaugmentation with CB1190 as a means to enhance *in situ* biodegradation of 1,4-dioxane at Air Force Plant 3, in Tulsa, Oklahoma. The field demonstration was performed using an emerging technology referred to as an *in situ* bioreactor. Detailed results from the 6-month ISBR demonstration will be shared during the webinar.

1,4-Dioxane Treatment Using ISCO

1,4-Dioxane has emerged as a contaminant of concern for numerous sites. It is most commonly found at sites co-mingled with chlorinated solvents and their daughter products. *In situ* chemical oxidation (ISCO) using activated potassium persulfate can generate both oxidative and reductive-free radical species that can expedite the destruction of 1,4-dioxane and chlorinated solvents. ISCO was evaluated for use at a site contaminated with 1,4-dioxane and chlorinated solvents in groundwater migrating from an industrial area into adjacent wetlands. Due to the sensitivity associated with working in a wetland, the remedial design focused on using permeable reactive barriers to minimize the footprint of injection activities. The remedial strategy was conducted in a stepwise process that included laboratory scale assessment, a field pilot test, and full-scale application. This webinar will provide a discussion of the results from treatability study through full-scale implementation.



Selection of a Dredge Material Dewatering Strategy

View Recording

Brian J. Mastin, PhD
brian.mastin@aecom.com

Selection of an efficacious dewatering strategy for dredge material (sediment and/or other residuals) can be a daunting task. Dewatering can be conducted by various conventional techniques, mechanical methods (e.g., filter press, centrifuge), gravity methods (e.g., CDFs, geotextile tubes), and/or addition of solidification/stabilization reagents as well as innovative approaches (e.g., pasting, dewatering boxes, Genesis WaterTM RDS and other hybrid systems). In this presentation, we will discuss dewatering strategy selection and use of cost/benefit analysis to compare the various techniques. Dewatering strategy selection is initially driven by the requirements (physical and chemical) for final disposition of the material as well as the availability of time and space for dewatering to occur.

Full-scale dewatering objectives for a dredge project typically include:

1. Cost-effective removal of water with the goal of meeting DOT requirements for shipping material off-site
2. Understanding dewatering efficacy such that the selected process matches the land available for siting the processing facilities;
3. Comparing the costs of off-site disposal for the resulting filter cake(s)
4. Expanding incorporation of sustainable or ESG practices

Secondary selection criteria may include but is not limited to:

1. Operational parameters (e.g., chemical conditioning, production rate, utilities, O&M)
2. Filter cake properties for assessing post-dewatering conditioning needs
3. Filtrate quality and quantity for assessing treatment and discharge needs

eMAP – Future-Forward Data Collection, Reporting & Analysis

Matthew Nanney, GISP, RPA
matthew.nanney@aecom.com

Tareq Adham
tareq.adham@aecom.com

View Recording

eMAP (Environmental Mobile Applications for Projects) is not just a suite of well-programmed software(s); it's a scalable solution of process controls and best practices. Field users have access to large sets of GIS and other datasets for GPS data collection. This allows them to make informed decisions as well as generate digital forms with photos in the field without relying on internet connectivity. Those datasets are synchronized and shared via web applications, dashboards for compliance tracking, and through automated reporting that match regulatory report templates.

AECOM's current build of eMAP is a future-forward system for ArcGIS Online, but deployed and managed separately than our internal company resources by AGOL. This is to ensure quality and efficiency for field deployments and inspection activities. eMAP can be configured to allow for seamless transfer of data into the client approved integrated geodatabase schema.

AECOM Innovations in Routing and Siting Analysis

View Recording

Melinda Jensen
melinda.jensen@aecom.com

Kristi Teykl
kristi.teykl@aecom.com

Doug Baldwin
doug.baldwin@aecom.com

AECOM has successfully applied innovative GIS solutions to routing and siting projects for greater efficiency in the selection of sound, defensible, and constructible T&D sites and routes. AECOM developed OptiSite and RouteAnalyst, a specialized framework of GIS tools and methodologies that apply a comprehensive, multi-tiered decision support model to assess existing constraints and aid planners and developers in efficiently identifying and analyzing optimum candidate sites and routes. This approach integrates a user-defined spatial assessment to identify environmental, cultural, infrastructure, and engineering considerations, identify minimum impact areas, and identify sites and routes best-suited for a specific type of energy development. The results are key elements that aid our clients in making informed decisions about complex siting considerations. Most critically, these tools offer the flexibility to be used as standalone processes or to augment existing siting methodologies.

This webinar will introduce attendees to AECOM's latest innovations in routing and siting analysis, which offer a number of advantages in comparison to more traditional siting and routing methods, including:

- Lower cost due to systematic, logical and efficient approach
- More rapid and flexible analysis via extensive use of GIS methods
- Ease of scenario evaluation and iteration with computer-based tools
- Open process conducive to client input and public participation
- Use of decision analysis tools at every step to optimize performance

Implementing Remediation Projects in Uncertain Times: Alternative Delivery and Contracting Strategies

Rick Brannon
rick.brannon@aecom.com

View Recording

In these uncertain times, owners of remediation projects are looking for ways to deliver and contract their work quicker using less owner resources and at a lower cost and risk profile. When delivery and contracting options are better understood, they can be leveraged together to accomplish the owner's goals, even in the face of significant technical, regulatory, stakeholder, resource and funding challenges. We'll discuss and define options, provide pros/cons, and offer case studies illustrating real-world applications.

CEQ NEPA Implementing Regulation Revisions

View Recording

Brian Boose, CEP
brian.boose@aecom.com

Brian Kennedy, AICP
brian.kennedy@aecom.com

Erin Lee
erin.lee@aecom.com

Bob Dover, PG
robert.dover@aecom.com

On July 15, 2020, the President's Council on Environmental Quality (CEQ) published in the Federal Register its final rule modernizing its National Environmental Policy Act (NEPA) implementing regulations (40 CFR 1500-1508 et. seq), which took effect on September 14, 2020 (**https://ceq.doe.gov/laws-regulations/regulations.html**). For the first time in 42 years, the CEQ fundamentally renovated and modernized these regulations. For those involved in NEPA, this is a big thing - a really big thing. Goaled on streamlining what some consider a complex process in the last 50 years, the regulations themselves shrunk from 30 to 20 pages. Many agree that the regulations are now better organized, more concise, and provide better clarity overall.

During this webinar, AECOM NEPA experts will review the key changes in the revised regulation and what they mean to Federal agencies, stakeholders, and NEPA practitioners. The pending change in U.S. administration and ongoing litigation concerning the revisions, we likely will see further discussion in the days ahead. Ultimately, the spirit and intent of NEPA – to include environmental considerations into each Federal agency's decision-making process, engage the public in that process, and strive to implement projects that minimize environmental damage – remain.

eDNA Solutions: Non-Invasive Wildlife Sampling to Expedite Permitting

Matthew Bettelheim
matthew.bettelheim@aecom.com

Jonathan Ward
jonathan.ward@aecom.com

View Recording

Applying innovative tools during the planning, permitting, and implementation phases of projects can provide a competitive edge. With the employment of non-invasive environmental DNA (eDNA) sampling, AECOM is pioneering new pathways to augment or replace traditional cost-and time-intensive protocol-level surveys with cutting-edge science. How? Animals may shed DNA in the form of hair, fur, skin, waste, or eggs. This DNA can be collected from the natural environment in situ through soil and water samples and analyzed in a laboratory setting to determine its originator by comparing the samples to known "barcodes" (primers) through an eDNA assay. The characterization of eDNA allows biologists to infer the presence or absence of species at a specific site without the need to trap, handle, and identify individuals.

eDNA and Acoustic Telemetry: The New Eyes and Ears of Sediment Site Assessments

View Recording

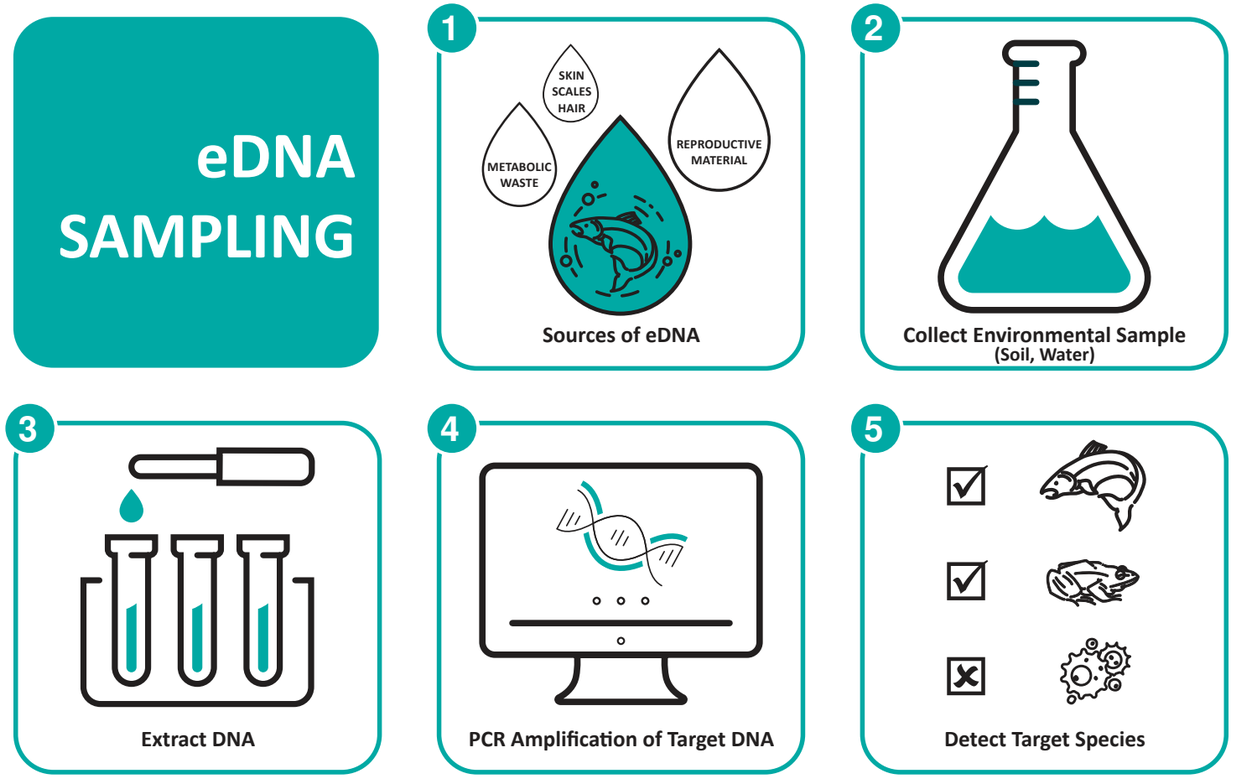
Matthew Bettelheim
matthew.bettelheim@aecom.com

Jonathan Ward
jonathan.ward@aecom.com

Betsy Ruffle
betsy.ruffle@aecom.com

The application of innovative tools can give projects a competitive edge during the planning, permitting, and implementation phases. AECOM is pioneering new pathways to augment or replace traditional costly and time-intensive surveys with cutting-edge science. Animals may shed DNA as hair, fur, skin, waste, or eggs. Such DNA can be collected from the natural environment in situ through soil and water samples and analyzed in a laboratory setting to determine its originator by comparing the samples to known “barcodes” (primers) through an eDNA assay. The characterization of eDNA allows biologists to infer the presence or absence of species at a specific site without the need to trap, handle, and identify individuals. Acoustic telemetry represents another tool for understanding both the presence/absence and detailed movement patterns of aquatic animals. By tracking acoustically tagged fish, their presence and movement in relation to areas of interest, such as contaminated sediments, can be characterized over time. The improved understanding of the spatial ecology of the fish species can inform conceptual site model development and reduce uncertainty in site remedial decision-making.

The key objectives of this webinar are to provide an overview of the science behind eDNA sampling and acoustic telemetry, explore the advantages and limitations of the science, and examine case studies to demonstrate how these technologies can be applied to improve project planning and implementation.



Evolving Environmental Impact Analysis and Permitting through Innovation

View Recording

Casey Talento, CPESC
casey.talento@aecom.com

Matthew Nanney, GISP, RPA
matthew.nanney@aecom.com

Brian Boose, CEP
brian.boose@aecom.com

Sara Durgan, PhD
sara.durgan@aecom.com

Jennifer Warf
jennifer.warf@aecom.com

Matthew Bettelheim
matthew.bettelheim@aecom.com

Join AECOM for a discussion of forward-looking, innovative tools that can be implemented on projects with varying scopes of work and project complexities. We will present useful tools, including: our eMAP system that streamlines large field data collection and manages data; use of drones and the depth of their capabilities; and virtual open house platforms for public engagement, as well as virtual digital EIS documents for public review and comments, as required through the NEPA process.

PFAS: Global Trends and Perspectives

Rachael Casson
rachael.casson@aecom.com

View Recording

This presentation will provide perspective on the current state of play and trends related to the regulation, collaboration and governance, assessment, analytical, research, treatment/remediation and waste management of PFA-related matters across global provinces. We will explore the range of levers influencing the cadence and prioritisation of actions and postures adopted to address PFAS issues across North America, Australia and Europe. What can we learn from jurisdictional commonalities and differences in approach to this global contamination issue?

Effective Stormwater BMP Operation and Maintenance for Permit Compliance

View Recording

Sujit Ekka, PE, PH
sujit.ekka@aecom.com

NPDES Permits often require Stormwater Control Measures (or BMPs) for treating post-construction stormwater runoff from urban development sites. Permittees include both public and private entities. BMP construction often requires a significant capital investment on the part of the owner. If not inspected and maintained properly, these devices can cease functioning, resulting in significant rehabilitation and restoration costs to bring devices back into compliance. With growing emphasis on urban stormwater management, regulatory agencies are requiring permittees to properly inspect and maintain their stormwater treatment devices as well as comprehensively document the associated activities and process. The AECOM team has assisted private industry, Federal Government, State Departments of Transportation, and municipalities with effective program development, inspection, operation, and maintenance of these critical stormwater assets.

PRISM® (**PR**edictive **I**ntegrated **S**tratigraphic **M**odeling)

Junaid Sadeque, PhD
junaid.sadeque@aecom.com

Ryan Samuels
ryan.samuels@aecom.com

View Recording

Predictive Integrated Stratigraphic Modeling (PRISM®) is an innovative, state-of-the-art methodology that provides a detailed understanding of the subsurface geology to better predict the fate and transport of contaminants at complex sites. Unlike traditional methods of subsurface investigation, which often fail to properly address the subsurface heterogeneity, PRISM® leverages Environmental Sequence Stratigraphy (ESS) and other best practices in geology and geophysics to create detailed cross sections of sediment layering that are consistent with known depositional patterns. These cross sections are then combined with hydrology and chemistry data to build fully integrated, comprehensive CSMs that can be used to develop more effective investigative and remedial strategies.

PRISM®

PRedictive **I**ntegrated **S**tratigraphic **M**odeling

Adaptive Management at Sediment Remediation Sites

Josh Collins
joshua.collins@aecom.com

Peter Brussock, PhD, PWS, CP
The ELM Group, Inc.

View Recording

Corrective actions at complex sediment sites are often mired in decades long characterization, design, and regulatory review processes that are inefficient, frustrating and delay the implementation of the selected remedy. Establishing an adaptive management remedial framework at a site can often expedite remedy implementation, allow for optimization of the remedial approach, and reduce overall program cost. This webinar will provide a high-level overview of what an adaptive management framework looks like at a sediment site, touch on the regulatory community's interest in adaptive management/early action and present two case studies where it is currently being successfully implemented.

Improving Social Outcomes

Best Practices of Remediation and Reclamation in Indigenous Communities

Glinis Buffalo
Planning Lead
Impact Assessment and Permitting Team in Western Canada and member of Samson Cree Nation, Maskwacis

Sherina Crier
Socioeconomic Advisor and a member of Samson Cree Nation in Maskwacis
sherina.crier@aecom.com

View Recording

This presentation provides an overview of best practices of remediation and reclamation in indigenous communities. We explore the importance of building and maintaining collaborative relationships with Indigenous Communities from the implementation of an indigenous contractor and procurement strategy and capacity building to maintaining a close connection to field project activities. A remediation and reclamation program must include meaningful dialogue and inclusion of the larger indigenous community; we take the time to share why it is essential to maintain connections through community engagement with Elders and knowledge keepers on the sharing of traditional knowledge. We share the importance of continual support for inclusion of an indigenous lens throughout the program.

Better, Faster Stakeholder Engagement in the Modern Age – Going Virtual

Andy Thomas
Regional Director and head of Visualisation & VR, EMEA
andy.thomas@aecom.com

Brian Boose
VP, National US Federal NEPA/Environmental Planning Leader
brian.boose@aecom.com

View Recording

In response to the COVID-19 pandemic and social distancing requirements, AECOM developed and is widely implementing a Virtual Consultation Meeting tool for many of our clients using proprietary, purpose-built software. The software creates a virtual meeting room, identical to a traditional stakeholder meeting space, where information is displayed and shared. The software accommodates both general public meetings as well as stakeholder-specific meetings in a website-based space. The platform is simple, easy to use, highly navigable, capable of comment acceptance and webinar (or land line) stakeholder involvement, has a chat function, and can include posters, videos, documents, fact sheets, fillable comment cards, recordation of the public meeting, tracking website visits, and other functionalities relevant to the public review. The platform is infinitely scalable, mutable, and adaptable to project-specific requirements, and is housed on a controlled website to manage accessibility. This presentation will demonstrate this technology, including examples of practical, real-world applications across an array of market sectors. To date, AECOM has seen significant positive stakeholder and client response to this new technology.

Wind Energy Siting Considerations and Tribal Partnerships

Barker Fariss
Office of Native Sovereign and Tribal Relations
barker.fariss@aecom.com

Despite existing and perceived economic and regulatory barriers, we believe there are more benefits than drawbacks to tribal partnership. But it is complicated; just as any two projects are not the same, any two tribal communities are not the same. To that end, identifying which communities may have concerns, which people are appropriate to talk to about those concerns, and addressing potential issues within constituent communities takes time. Meaningful relationships are imperative for the success of a project in today's social and political climate. While there are several, seemingly well-established best management practices for building meaningful relationships with tribes, the wind energy industry must remain flexible to accommodate new and innovative ways to encourage successful partnerships with tribal communities.

View Recording

Workforce of the Future – How Changing Demographics Should Affect Your Safety Program

Michelle Coutu MSPH, CIH, CSP
michelle.coutu@aecom.com

View Recording

As the twenty first century continues to unfurl, we know one thing is for certain, change is inevitable. The workforce that we strive to empower and protect looks very different from the work force of even 20 years ago. Understanding the past and present will help us anticipate future trends, allowing us to proactively prepare for the next challenge. In addition to age, we will discuss how cultural barriers impact the implementation of our safety programs. We will review best practices for building people-centered safety programs focused on protecting a diverse workforce.

Incorporating Diversity, Equity and Inclusion into Environmental Programs: Emerging Issues, Practices and Strategies

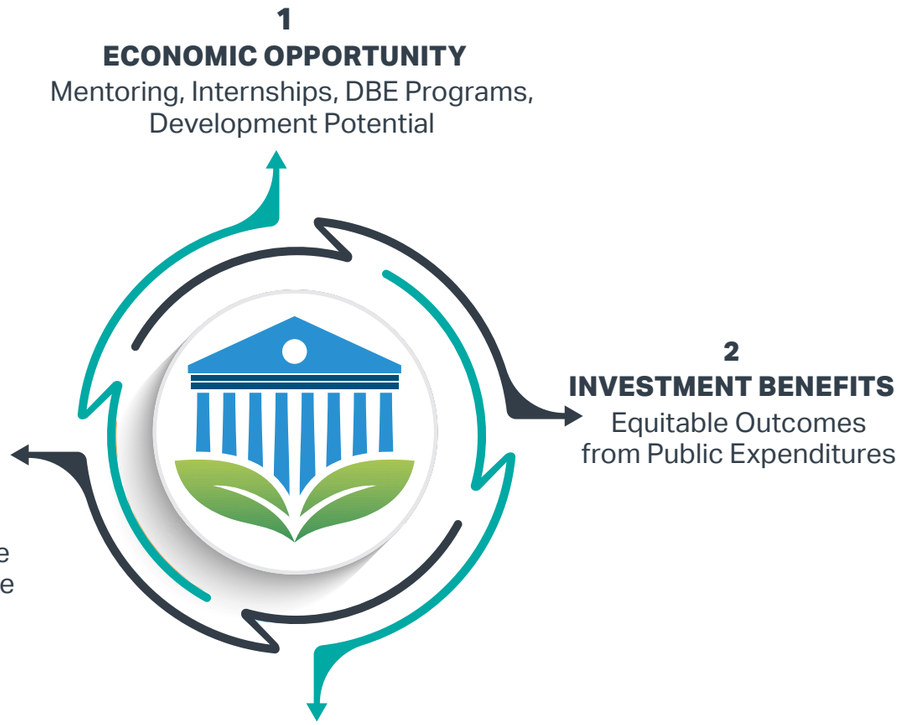
Brian Kennedy
brian.kennedy@aecom.com

Kory Wilmot
kory.wilmot@aecom.com

Ashley Bush
ashley.bush@aecom.com

Kelli Bernard
kelli.bernard@aecom.com

Four Key Areas of DEI



Public involvement and environmental justice are required aspects of state and federal approval processes such as NEPA and have been critical components of public decision-making for decades. As a result of COVID-19, increased racial tensions and other factors, the terms diversity, equity and inclusion (DEI), and their underlying issues, have brought change and new approaches to the deliberative decision-making process. This webinar highlights changing requirements, expectations and methods for dealing with DEI and ways of optimizing tasks and outcomes through the implementation of Best Management Practices.

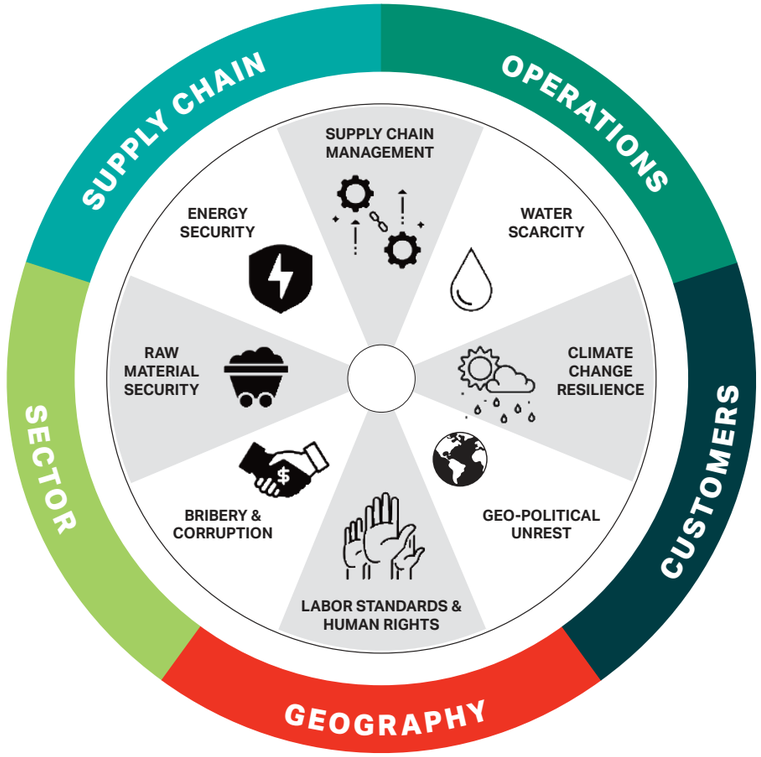
View Recording

Emerging Trends in ESG: Drivers, Guidance and Practices

View Recording

Sally Vivian
sally.vivian@aecom.com

This presentation discusses the environmental, social, and governance (ESG) trends that have emerged and/or started to become more established in 2020. The webinar includes discourse about changing drivers, evolving guidance and developments in practices.



ENVIRONMENTAL, SOCIAL & GOVERNANCE

HIGH RISK GEOGRAPHIES
- Water scarcity
- Geopolitical issues
- Labor standards
- Extreme weather events, etc.

HIGH RISK SECTORS
- Energy/water intensive
- Raw materials
- Resource extraction
- Health & safety issues
- Product stewardship

Social Strategies for Enhanced ESG Outcomes

View Recording

Across Canada and the U.S., many large infrastructure project teams rightly consider public and Indigenous concerns, but if not done well, it can sometimes lengthen the overall project timeline. AECOM's Social Strategy process is designed to help stakeholders and clients understand the balance between social, environmental and economic considerations, thereby clarifying choices and leading to enhanced social consent.

The growing push for businesses to demonstrate their commitment to environment, social, and governance (ESG) principles increases the importance of achieving social consent. Our experts discuss how a successful ESG process increases the certainty of project implementation, improves relationships with regulators and affected communities, and leads to reduced cost and risk.

Avril Fisken
avril.fisken@aecom.com

Brady Romanson
brady.romanson@aecom.com

Gene Cabral
Executive Vice-President for Ports Toronto and Billy Bishop Toronto City Airport

Hans Bleiker
President
Bleiker Consent Training

Project Planning Tools for Streamlined Environmental and Social (Equity) Impact Analysis & Engagement

Matthew Harris
matthew.d.harris@aecom.com

Avinash Srivastava
avinash.srivastava@aecom.com

Andy Thomas
andy.thomas@aecom.com

AECOM's Environmental Engagement (EE) platform provides fully customized and interactive digital environmental and social impact assessment and compliance reporting capabilities. The tool's adaptability makes it an innovative solution to streamline the environmental review process, saving time and money, while presenting data in a more user-friendly manner for all stakeholders. Designed for hosting project data, the platform synchronizes interactive maps with technical assessments and is more engaging than traditional static environmental reports. The platform works seamlessly with AECOM's virtual stakeholder engagement room where stakeholders can comment, ask questions, and engage in project development and decision-making. As a cloud-based platform centralizing GIS maps, technical data, and reporting, EE allows project delivery within a single platform where project teams and clients collaborate. Integration of AECOM's innovative digital equity impact analytical tools further strengthens the platform and enables projects to optimize their triple bottom line. This webinar presents an overview of these technologies.

View Recording

Achieving Net-Zero Carbon Emissions

Trichloroethylene in Indoor Air: New Tools to Rapidly Evaluate Potential Exposures

Bart Eklund

Marty Hale
marty.hale@aecom.com

View Recording

In vapor intrusion (VI) studies, trichloroethylene (TCE) often gets special attention because of concerns about its toxicity, resulting from even relatively short-term exposure. Therefore, there is interest in finding and addressing preferential pathways and indoor sources of TCE as quickly as possible. We will describe recent work that included performing real-time TCE measurements at multiple facilities using a field GC, a HAPSITE GC/MS, and a FROG portable GC. Data are presented and discussed related to the analytical sensitivity of the various analyzers, correlations found during side-by-side measurements, measurement frequency and turnaround time, and ease of use.

Fenceline Air Monitoring Programs for Remediation Sites

Melissa McLaughlin
Services Manager, Chelmsford Air Quality Measurements and Studies Group
melissa.mcLaughlin@aecom.com

View Recording

AECOM continues to perform extensive design, installation and operation of perimeter ambient air quality and meteorological programs during this time, including those involving: remediation of hazardous waste; former MGP sites; building demolition; and dredging and sediment processing areas. Topics include: key design elements and challenges within remediation projects; choices around performance indicators and delivering timely feedback to site decision makers; how to use air monitoring to address community concerns and to keep regulators informed; and the role of air monitoring and emission controls in keeping remediation projects on schedule. Examples of how projects might be designed will be included.

Innovative Modeling Approaches for Air Permit and Regulatory Applications

Bob Paine
bob.paine@aecom.com

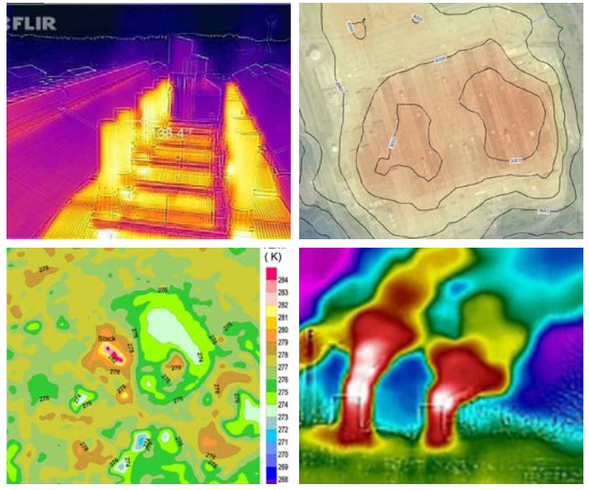
Laura Warren
laura.warren@aecom.com

Mary Kaplan
mary.kaplan@aecom.com

Chris Warren
chris.warren@aecom.com

Dispersion modeling is a key element in the characterization of air quality impacts of proposed or existing emission sources. In the United States and other countries, regulatory agencies prescribe methods for using approved dispersion models for this purpose. However, regulators, as well as affected stakeholders, continue to assess refinements to dispersion models to improve the accuracy of their performance. AECOM is at the cutting edge of this process and continues to be a leader in designing, testing, and applying dispersion modeling approaches, now for decades. We'll provide an overview of current, innovative approaches in several areas of interest relevant to current and future regulatory applications. We'll explore how AECOM's approaches to innovative dispersion modeling techniques can improve the success of current and future air quality regulatory applications.

View Recording



Carbon Neutrality and Net-Zero GHG Emissions: What Does it All Mean?

Michael Conrardy
michael.conrardy@aecom.com

As a response to climate science, the Paris Agreement sets an international goal "to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases". In response to this international goal, the growth in the use of terms such as carbon neutrality, climate neutrality and net-zero have emerged; and this led to confusion amongst stakeholders on how individual entities should respond. This webinar will summarize these issues and discuss paths forward for organizations meet the goals of carbon neutrality.

View Recording

AECOM Energy Data Analytics – Make Buildings Better

View Recording

Jerry Burin
jerry.burin@aecom.com

Syed Suhail
syed.suhail@aecom.com

Craig Sieben
craig.sieben@aecom.com

AECOM's energy data analytics platform is built to analyze data from diverse sources. Historically, large buildings have offered data streams from their HVAC equipment and embedded HVAC system sensors. Any sized facility across an enterprise can be the source of HVAC data for AECOM energy analytics, as well as data from any other source of enterprise operations. Analyzing such data makes buildings better and improves enterprise performance.

AECOM's energy data analytics suite of tools includes SkySpark, which not only acquires and analyzes data from any digital source, but also identifies and interprets meaningful patterns in HVAC performance data. AECOM offers its clients an HVAC performance platform that enables a level of system forensics revealing previously invisible information about why equipment isn't working as intended. AECOM can help its clients go beyond just identifying what happened to look for why it happened. Our goal is to help gain a better understanding of how equipment operates and where there are opportunities to improve performance.

AECOM's data analytics platform fits into any client's innovation model, leveraging IoT technology. It is currently in use in projects involving investment real estate, higher education, manufacturing, and a healthcare campus.

RACC PWR: Resilient Energy Networks & Utilities Solutions

View Recording

T. Luke Young
t.luke.young@aecom.com

Darcy Immerman
darcy.immerman@aecom.com

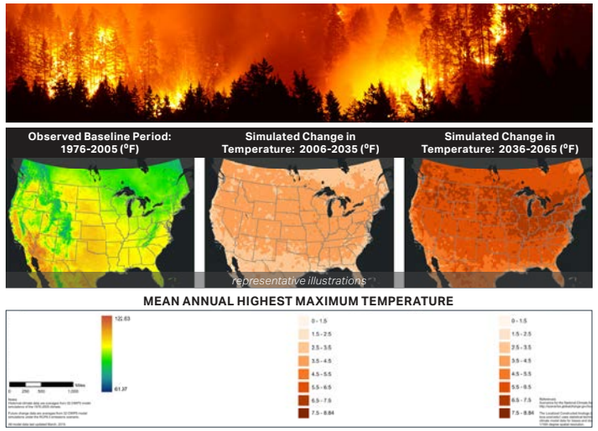
Ali Molthen
alexa.molthen@aecom.com

Adam Davis
adam.davis@aecom.com

Cindy Varnier
cindy.varnier@aecom.com

Andy Burkemper
andrew.burkemper@aecom.com

Harsh and extreme climate is increasingly destabilizing our communities and placing pressure on infrastructure, particularly power assets that are struggling to cope or already at capacity. The presentation will provide an overall view of the impacts of climate hazards on energy networks and utility operations and highlight the necessity to include future climate change scenario modelling in risk assessments and resilience planning. It will outline the economic and socio-economic value proposition of resilience assessments for clients and how they are leveraged to set up success. Case studies will demonstrate how companies use climate risk assessments to develop adaptation responses and management practices to ensure continued reliable service to customers and reduce economic impact of extreme climate events and climate trends leading to resource and infrastructure stresses.



Connected Communities

Bill Abolt
william.abolt@aecom.com

Paige Humecki
paige.humecki@aecom.com

Katrina Lewis
katrina.lewis@aecom.com

"Connected Communities" and "Smart Cities" integrate intelligent technologies with the natural and built environments, including infrastructure, to improve the social, economic, and environmental well-being of those who live, work, or travel within them. Hear from AECOM's energy experts about driving connected communities - from visioning, concept development and design integration, to delivery, maintenance and monitoring. Learn about practical and effective solutions for cities, utilities, and community residents that improve community livability while addressing economic, environmental, and social issues.

View Recording

Nuclear Power and the Green Economy

Kevin Taylor, CHP
kevin.taylor@aecom.com

View Recording

AECOM's IAP business line has been supporting nuclear power initiatives for more than 15 years. Our recent and current efforts include preparing environmental assessment documents for the second relicensing of existing nuclear power plants, extending the operating license to 80 years, as well as several works involving nuclear reactors that are designed to test new materials, advanced reactor technology, and new nuclear fuels. In this presentation, we'll discuss the scope of our current projects and our combined experience associated with the advancement of nuclear power and nuclear waste management in the U.S. and Canada.

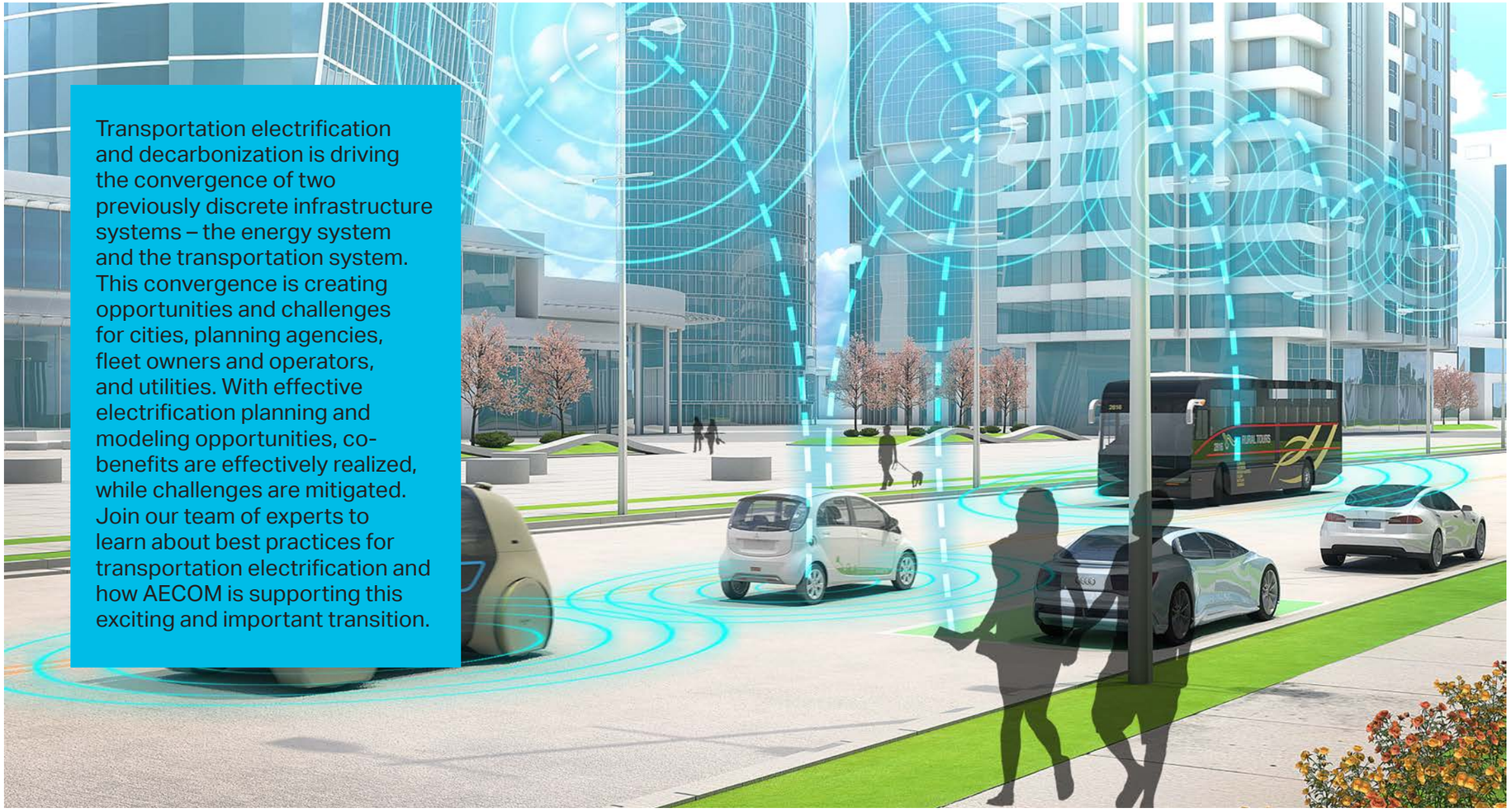
Planning and Modeling Tools for an Electrified Future

View Recording

Dr. Dana Al-Qadi
dana.alqadi@aecom.com

William Haas
william.haas@aecom.com

Steven Hall
steven.hall@aecom.com



Transportation electrification and decarbonization is driving the convergence of two previously discrete infrastructure systems – the energy system and the transportation system. This convergence is creating opportunities and challenges for cities, planning agencies, fleet owners and operators, and utilities. With effective electrification planning and modeling opportunities, co-benefits are effectively realized, while challenges are mitigated. Join our team of experts to learn about best practices for transportation electrification and how AECOM is supporting this exciting and important transition.

Enhancing Governance

Going Beyond the TRIR: Renew Focus on High-Consequence Risks

Although many companies only focus on lagging indicators such as OSHA recordable injuries, an emphasis on unsafe behavior/acts and using leading indicators is recognized by many safety professionals as a better way to improve safety in the workplace. Our webinar will help our clients renew their focus on high-consequence risks.

Peter Kroll, PE, CPEA, CPSP, CSP
peter.kroll@aecom.com

View Recording

Grounded! Conducting Virtual EHS Audits and Due Diligence Assessments - Tips and Lessons Learned

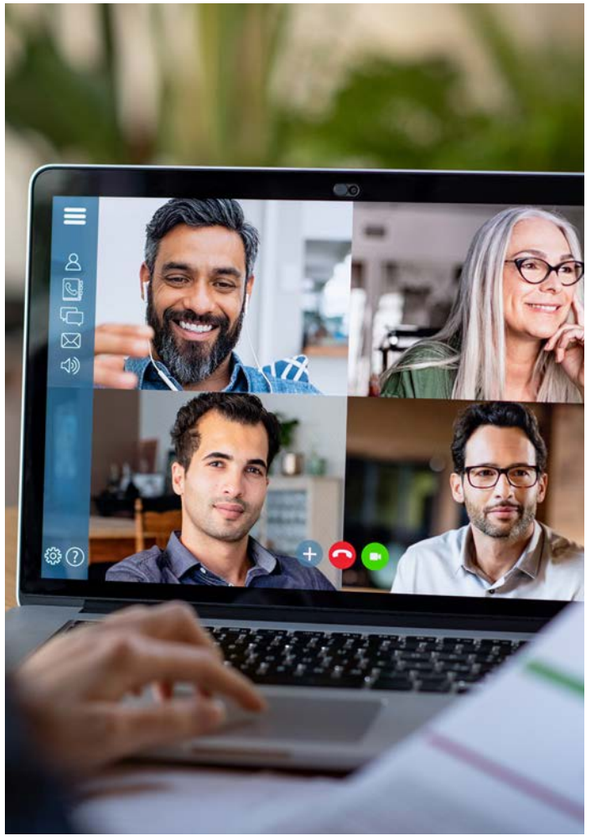
In this webinar, we educate our clients on how to conduct EHS audits in a virtual way, present current tools, and expand on EHS auditing and due diligence during Covid-19.

View Recording

Joseph Muggli, CPEA
Environmental Scientist
joseph.muggli@aecom.com

Bob Feldmann
IAPC Director, Technical Leader - EHS Auditing & Compliance
bob.feldmann@aecom.com

Mary Beaton
Project Manager, Technical Leader, Environmental Due Diligence
mary.beaton@aecom.com



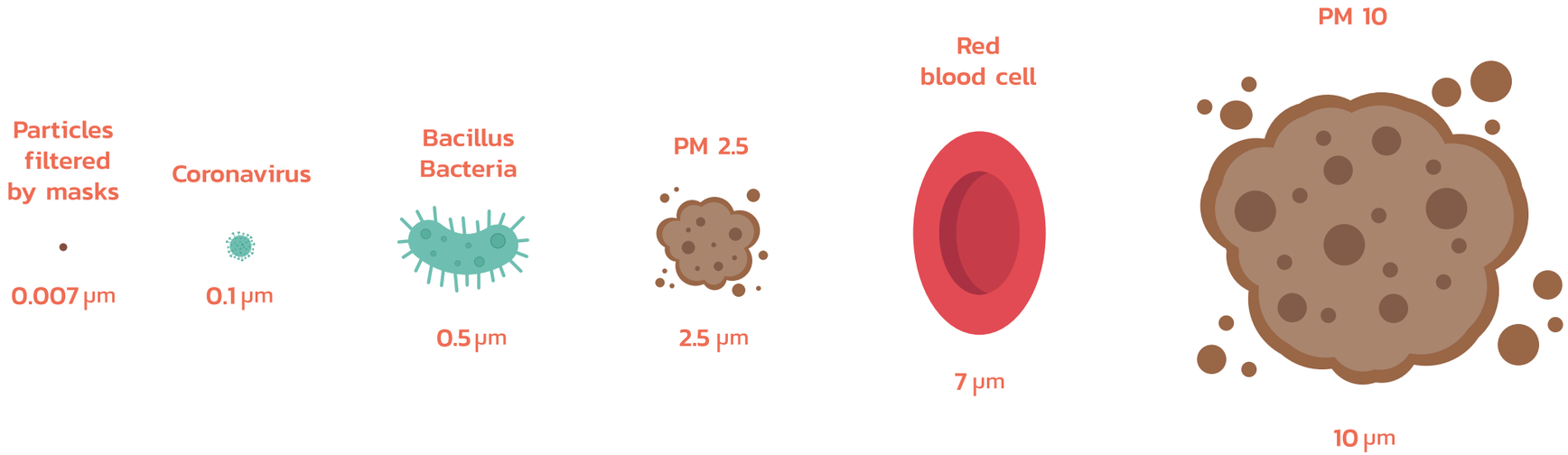
Controlling Aerosols - Including Those Associated with Disease Transmission

Martha Boss, CIH, CSP, PCQI, CPM
martha.boss@aecom.com

View Recording

Aerosols – Addressing Chemical and Biological Risks

Aerosolization is the process of putting solids (particulates, fumes), liquids (vapors, mists), or other gases into an air stream. This familiar process is exemplified by aerosol cans that use pressure differentials to cause their contents to be emitted into the air. The more subtle aerosolization occurs every day, hour, and minute; as our air streams mix. If the new entrained chemicals or biologicals do not trigger our sense of smell or otherwise irritate us; we may be oblivious to the changes in our air. We continue to breath in the air available to us; and may in the process of inhalation, dose our body with contaminants. A knowledge of how aerosolization occurs, and the potential control measures has become increasingly important as we deal with disease, climate, and facility design issues worldwide. We will also discuss the phenomena of agglomeration, which is the propensity of certain particulates to stick together or to align with a combination of liquid and solid particulate. While such phenomena may aid in filtration controls, the risk is that agglomerated particulate may be more respirable. Relative to total airborne particles, the particle size having 50% penetration for the thoracic and respirable fractions are 10 µm and 4.0 µm (aerodynamic diameter), respectively. Agglomeration of the chemical hazards or virus particulate within the available air stream to humans may be of concern. This webinar will provide real world examples of both the risk and the controls that can be employed to lessen those risks.

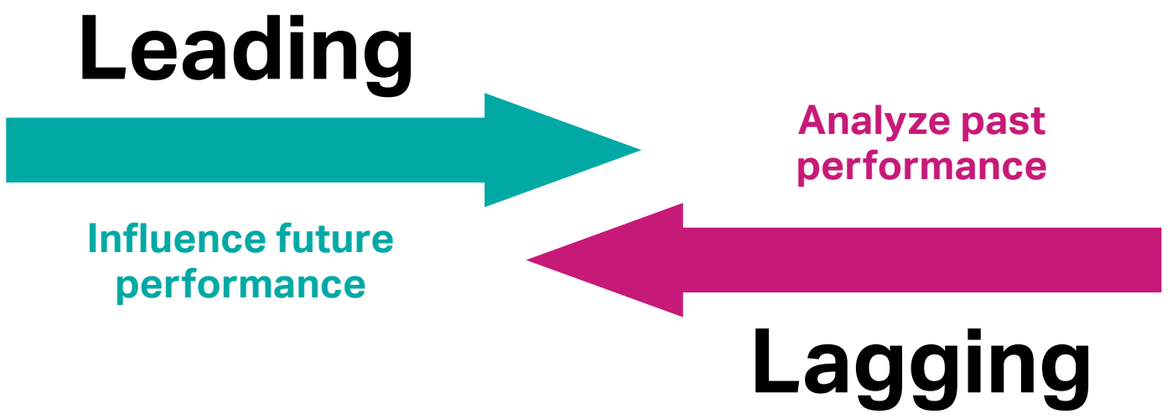


Lead, Don't Lag! Use Leading Indicators to Monitor and Improve EHS Performance

Tom Weeda
tom.weeda@aecom.com

Monitoring and reporting on lagging performance indicators, such as injury rates, emission exceedances, and regulatory exceptions, are necessary – but not sufficient. Using indicators that are indicative of future performance and require the inclusion of operational management is much more likely to provide several benefits: attainment of a more realistic and balanced view of your EHS programs; an ability to identify future performance and resource needs; and an opportunity to prioritize your EHS activities with an eye towards the future. We'll discuss: relevant indicators; how to measure, normalize, and socialize them; and how to keep them relevant.

View Recording



Ammonia Risk Management Planning

Gayle Nicoll, PhD, REP, ASP, CSP
gayle.nicoll@aecom.com

Anhydrous ammonia is frequently used in industrial and agricultural applications, both as a fertilizer as well as a chilling agent. In fact, ammonia accounts for the majority of facilities that register with the EPA for the Risk Management Program (RMP). Anhydrous ammonia systems have some inherent risks and challenges due to the chemical properties of ammonia, but many people are not aware of these risks. Often, the anhydrous ammonia system works in the background, and is assumed to be safe – until something bad happens. Proper precautions need to be taken, and the RMP must be safely and correctly implemented. In this webinar, Dr. Gayle Nicoll, PhD, REP, ASP, CSP, will discuss some of the challenges associated with anhydrous ammonia from a chemical standpoint, the common pitfalls that facilities fall into, and ways to avoid these mistakes.

View Recording

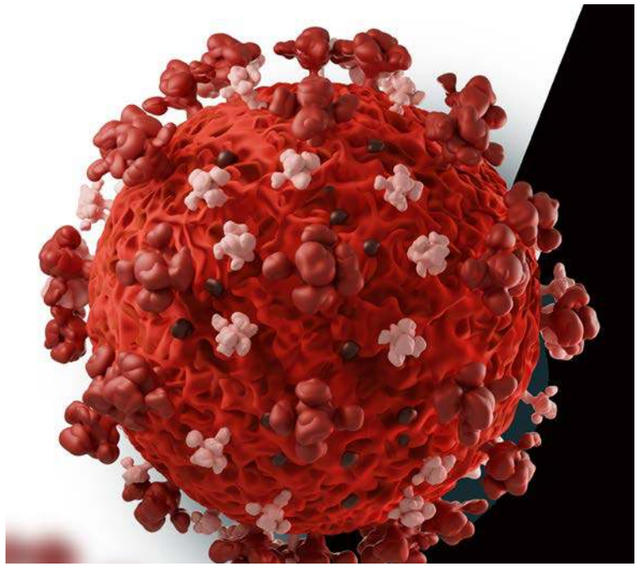
Wastewater Monitoring for Early Detection of COVID-19 Infected Populations

Michael "Mick" Edgar
michael.edgar@aecom.com

View Recording

The detection of COVID-19 infected individuals in populations is critical to manage the pandemic. Although vaccination reduces the health effects of the virus, it does not eliminate the infection completely. The emergence of genetic variants also increases the threat to public health and economic recovery. Infected individuals shed the virus in feces up to 10 days prior to exhibiting symptoms. Automated composite wastewater sampling and RT qPCR genetic laboratory testing detects the presence of virus on a "pooled" basis, examining an entire group of individuals, which is minimally invasive, very accurate and cost-effective. This webinar discusses various sampling strategies, test procedures and data visualization techniques employed in municipal wastewater plants, correctional institutions, office complexes and manufacturing plants across the US.

During this webinar, attendees will learn about various sampling and testing methods to detect the SARS CoV-2 virus in wastewater, including lessons learned. Data reporting including trend analysis and the use of GIS mapping of sewer sheds for data visualization will be discussed.



Process Safety Management (PSM): Implementing a Flexible Pre-Startup Safety Review

Gayle Nicoll, PhD, REP, ASP, CSP
gayle.nicoll@aecom.com

View Recording

Please join us for a presentation on a customized, flexible Excel-based Pre-Startup Safety Review developed by Gayle Nicoll, PhD, REP, ASP, CSP for one of our global chemical manufacturers. The Excel tool uses a series of user-friendly, easy-to-answer questions to identify what critical items need to be addressed as part of the safety review, instead of a long, cumbersome and obtuse checklist. The presentation outlines the over-arching approach taken, as well as the net result, which has been improved over the last year into a tool that has helped change the culture of safety and implement a robust Management of Change program.

About AECOM

AECOM is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle – from planning, design and engineering to program and construction management. On projects spanning transportation, buildings, water, new energy and the environment, our public- and private-sector clients trust us to solve their most complex challenges. Our teams are driven by a common purpose to deliver a better world through our unrivaled technical expertise and innovation, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities. AECOM is a Fortune 500 firm and its Professional Services business had revenue of $13.2 billion in fiscal year 2020.

See how we are delivering sustainable legacies for generations to come at aecom.com and @AECOM.

aecom.com