

FINAL PROGRAM



Environmental and Public Health Effects, Analysis, Fate, and Remediation

Over 200 Presenters

9 Workshops

45 Exhibitors

Socials

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The Association for Environmental Health and Sciences (AEHS) Foundation is proud to announce

The 25th Annual International Conference on

Soil, Water, Energy, and Air

March 23-26, 2015

Mission Valley Marriott, San Diego, California

Conference Directors:

Paul Kostecki, Ph.D. and Edward J. Calabrese, Ph.D., *University of Massachusetts, Amherst, MA*



CONFERENCE at a GLANCE

Conference map is located on back of program

MONDAY, MARCH 23

Registration: 10:00am – 3:00pm, *Foyer*
Afternoon Break: 3:00pm – 3:30pm, *Foyer*

WORKSHOPS

- Workshop 1** 1:00pm – 5:00pm, Vapor Intrusion (VI) Exposures, Part I, *Pavilion*
Workshop 2 1:00pm – 5:00pm, In Situ Thermal Remediation Workshop, *Santa Fe 3*
Workshop 3 1:00pm – 5:00pm, Geochemical Evaluations of Metals in Environmental Media, *Salon G*
Workshop 4 1:00pm – 5:00pm, Classic and Emerging Environmental Forensics Techniques and Applications, *Sierra 5*
Workshop 5 1:00pm – 4:00pm, Environmental Forensics - Utilization of Established and Evolving Techniques, *Salon H*
Workshop 6 1:00pm – 5:00pm, California Water Summit, *Cabrillo II*

TUESDAY, MARCH 24

Registration: 7:30am – 7:00pm, *Foyer*
Exhibit Hall Hours: 9:00am – 7:00pm, *Exhibit Hall, Salons A-F*
Breaks: 10:00am and 3:00pm (30 min), *Exhibit Hall, Salons A-F*
Luncheon: 12:00pm – 1:30pm, *Cabrillo*

Lunch Speaker: "Achieving the Vision for a Low-Carbon Grid"
Frank Lindh, *Partner, Crowell & Moring, LLP, San Francisco, CA*

MORNING PLATFORM SESSIONS, 8:30/9:00am – 12:00pm

- Session 1:** Combining Remediation Technologies for Optimal Results, *Sierra 5*
Session 2: Energy, *Salon G*
Session 3: Naphthalene, *Santa Fe 3*

AFTERNOON PLATFORM SESSIONS, 1:30pm – 4:30/5:00/5:30pm

- Session 1:** Bioremediation, *Sierra 5*
Session 2: Hydraulic Fracturing, *Salon G*
Session 3: Constituents of Emerging Concern, *Santa Fe 3*
Session 4: Technology Advancements in Remediation Science, *Pavilion*

Poster Presentations & Social, 3:00pm – 6:00pm, *Foyers and Sunroom*

Welcome Reception/Wine and Cheese Social, 5:00pm - 7:00pm, *Exhibit Hall, Salons A-F*
(Free to all registered conference attendees)

WORKSHOPS

- Workshop 1** 8:30am – 12:00pm, Vapor Intrusion (VI) Exposures, Part II, *Pavilion*
Workshop 7 6:30pm – 9:30pm, Assessment and Evaluation of Vapor Intrusion at Petroleum Release Sites, *Sierra 5*
Workshop 8 6:30pm – 9:30pm, Nationwide Trends and Developments in Cleanup Levels for Petroleum Hydrocarbons in Soil, *Salon G*
Workshop 9 6:30pm – 9:30pm, Natural Resource Damage Assessment: Measuring Injury to Natural Resources for NRDA, *Santa Fe 3*

WEDNESDAY, MARCH 25

Registration: 7:30am – 7:00pm, *Foyer*
Exhibit Hall Hours: 9:00am – 7:00pm, *Exhibit Hall, Salons A-F*
Breaks: 10:00am and 3:00pm (30 min), *Exhibit Hall, Salons A-F*
Luncheon: 12:00pm – 1:30pm, *Cabrillo*

Lunch Speaker: "Pollution Prevention through Safer Consumer Products: Using Green Chemistry to Protect Air, Water, and Soil"
Meredith Williams, *Deputy Director, Department of Toxic Substances Control, Sacramento, CA*

MORNING PLATFORM SESSIONS, 8:30/9:00am – 12:00pm

- Session 1:** Regulatory Perspectives on Site Closure Criteria, *Salon G*
Session 2: Environmental Impact of Nanotechnology, *Sierra 5*
Session 3: Contaminants of Emerging Concern, *Santa Fe 3*
Session 4: Petroleum Hydrocarbon Vapor Intrusion I, *Pavilion*

AFTERNOON PLATFORM SESSIONS, 1:30pm – 4:30/5:00/5:30pm

- Session 1:** Regulatory Programs & Policies, *Salon G*
Session 2: Environmental Forensics, *Sierra 5*
Session 3: Remediation, *Santa Fe 3*
Session 4: Petroleum Hydrocarbon Vapor Intrusion II, *Pavilion*
Session 5: California Brownfields Reuse and Transactions (3:30pm–5:30pm), *Cabrillo*

Poster Presentations & Social, 3:00pm – 6:00pm, *Foyers and Sunroom*

Evening Social, 5:00pm - 7:00pm, *Exhibit Hall, Salons A-F*
(Free to all registered conference attendees)

THURSDAY, MARCH 26

Registration: 7:30am – 12:00pm, *Foyer*
Exhibit Hall Hours: 9:00am – 12:00pm, *Exhibit Hall, Salons A-F*
Break: 10:00am (30 min), *Exhibit Hall, Salons A-F*

MORNING PLATFORM SESSIONS, 8:30/9:00am – 12:00/12:30pm

- Session 1:** Environmental Fate and Modeling, *Sierra 5*
Session 2: Risk Assessment/Site Assessment, *Salon G*
Session 3: Innovative Remedial Technologies, *Santa Fe 3*
Session 4: Vapor Intrusion, *Pavilion*



DRAWING

Enter to win a free registration to one of our next two conferences!

Entry and drawing will take place during each of the four Thursday morning sessions.

WINNERS IN EVERY SESSION!

Must be present to win. Several second place winners will receive free 2015 AEHS Foundation Membership! Drawings will take place at the conclusion of each session.

GENERAL INFORMATION

Exhibit Hours (Ballroom Salons A-F and Foyer)

Tuesday, March 24..... 9:00 am – 7:00 pm
Wednesday, March 25..... 9:00 am – 7:00 pm
Thursday, March 26..... 9:00 am – 12:00 pm

Poster Presentations (Sunroom and Foyer)

Tuesday, March 24..... 3:00 pm – 6:00 pm
Wednesday, March 25..... 3:00 pm – 6:00 pm

Socials

Tuesday, March 24..... 3:30 pm – 6:00 pm
Accompanies Poster Session (Sunroom/Patio)
Tuesday, March 24..... 5:00 pm – 7:00 pm
Wine/Welcome Reception (Ballroom Salons A-F)
Wednesday, March 25..... 3:30 pm – 6:00 pm
Accompanies Poster Session (Sunroom/Patio)
Wednesday, March 25..... 5:00 pm – 7:00 pm
Evening Social (Ballroom Salons A-F)

Exhibitors (See floor plan handout for booth locations or download our App)

Accutest Laboratories	EOS Remediation	National Exploration Wells & Pumps
ACZ Laboratories	EthicalChem	OnMaterials
ALS Environmental	Eurofins Air Toxics	Performance Analytical Laboratories
AMS, Inc.	GEI Consultants	PerkinElmer
Antea Group	Global Remediation Solutions	PeroxyChem
Aquablok	H&P Mobile Geochemistry	ProHydro, Inc./Snap Sampler
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Bays Environmental Remediation Management	Innovative Construction Solutions	QED Environmental Systems
Blaine Tech Services	In-Situ	Regenesis (Supporter)
Brown & Caldwell (Sponsor)	Intrinsic Environmental Sciences US, Inc. (Sponsor)	Truesdail Laboratories
Cascade Drilling	JRW Bioremediation	US Army Medical Recruiting Center
Clean Vapor LLC	Mar Systems	Wayne Perry
Confluence Environmental	McCampbell Analytical	Willowstick Technologies
Cox-Colvin & Associates	Microbial Insights	Yellow Jacket Drilling
DEXSIL Corporation	Microseeps, A Division of Pace Analytical Services	
Directed Technologies Drilling		

Workshop 1 1:00pm – 5:00pm, *Pavilion*
Vapor Intrusion (VI) Exposures – Long-Term Evidence-Based Protection & Sustainability, Part I

Workshop 2 1:00pm – 5:00pm, *Santa Fe 3*
In Situ Thermal Remediation Workshop

John LaChance, ARCADIS U.S., Inc., Chelmsford, MA
 Grant Geckeler, GEO, Inc., Corona, CA
 Lowell G. Kessel, M.S., P.G., GEO, Inc., Corona, CA

Workshop 3 1:00pm – 5:00pm, *Salon G*
Geochemical Evaluations of Metals in Environmental Media: How to Distinguish Naturally Elevated Concentrations from Site-Related Contamination

Jonathan Myers, Ph.D., CB&I Federal Services, Albuquerque, NM
 Karen Thorbjornsen, P.G., CB&I Federal Services, Knoxville, TN

Workshop 4 1:00pm – 5:00pm, *Sierra 5*
Classic and Emerging Environmental Forensics Techniques and Applications

Ioana G. Petrisor, Ph.D., Great Ecology, San Diego, CA
 Helder Costa, Haley & Aldrich, Inc., Boston, MA
 Michael J. Wade, Wade Research, Inc., Marshfield, MA
 Jean Christophe Balouet, Environmental International, Le Perreux-sur-Marne, France
 Jeffrey L. Caufield, Caufield & James LLP, San Diego, CA

Workshop 5 1:00pm – 4:00pm, *Salon H*
Environmental Forensics - Utilization of Established and Evolving Techniques

Paul Philp, University of Oklahoma, Norman, OK

Workshop 6 1:00pm – 5:00pm, *Cabrillo II*
California Water Summit

Moderators: Ravi Arulanantham, Ph.D., Geosyntec Consultants, Oakland, CA
 Yue Rong, CA RWQCB, Los Angeles, CA

Panelists:

George Alexeeff, Director, CalEPA/OEHHA, Sacramento, CA
 Tam Doduc, Board Member, California State Water Resources Control Board, Sacramento, CA
 Stewart Black, California EPA, Department of Toxic Substances Control, Sacramento, CA
 Bill Funderburk, Partner at Castellón & Funderburk LLP and Vice Chairman of the Board of Commissioners of Los Angeles Department of Water and Power
 Ted Johnson, Water Replenishment District of Southern California, Lakewood, CA
 TBA – Environmental Advocacy Representative

Announcing the 6th Annual AEHS Foundation Achievement Awards

The Annual International Conference on Soil, Water, Energy, and Air is pleased to announce the recipients of the AEHS Foundation Achievement Award. This award is presented to individuals or organizations that have shown significant contributions to the field as well as outstanding environmental stewardship. This year's winners are Kevin Graves, California State Water Resources Control Board, Sacramento, CA and Henry Schuver, US EPA, Washington, DC.

Currently the Chief of the UST and Site Cleanup Section at the California State Water Resources Control Board, **Kevin Graves** has over 20 years of experience with groundwater investigation and remediation. He received a Bachelors degree from UC Santa Barbara in mechanical engineering and a Masters degree from California State University Sacramento in civil engineering and is a registered Professional Engineer in both civil and mechanical engineering. Mr. Graves received a superior accomplishment award from the State Water Resources Control Board in 2013 for his work in the preparation of the "Low-Threat UST Case Closure Policy" that was adopted in 2012. In addition to his work in the UST program, he is currently focusing on sources of chlorinated solvent contamination in public water supply wells.



Henry Schuver holds a Doctor of Public Health (DrPH) in Environmental Epidemiology from Johns Hopkins School of Public Health and a Master of Science in Geology from Arizona State University. He has been an Environmental Scientist with the USEPA's Office of Resource Conservation and Recovery (ORCR), Cleanup Programs Branch since 1997. In 1999, to help meet the Government Performance and Results Act (GPRA) of 1993, he authored the national RCRA Corrective Action Environmental Indicator (EI) guidance for both Groundwater Migration and for Human Exposures. The Human Exposures EI guidance-forms required a review of all plausible exposure pathways from subsurface contamination including impacts to indoor air. He subsequently led the development of the 2001 Supplemental Guidance for Vapor Intrusion (VI) for RCRA EI Determinations (at all High-Priority RCRA sites) which raised the awareness of VI exposures nationally and led to the development of the 2002 OSWER draft VI guidance. Since 1999 he has been leading annual national workshops with national and international experts in VI to improve the scientific understanding of vapor intrusion and VI risk-management decision making. He is currently leading the development of a technical document on 'Radon Lessons' based on the scientific observations from decades of Radon intrusion studies. His life goal is to find cost-effective responses to VI risks/potential that benefit all stakeholders including public health and welfare, such as 'Soil-Gas Safe Communities.' Prior to coming to USEPA headquarters in Washington, he worked in the USEPA Regional office in NY (1995-1997), as an environmental consultant in PA (1989-1995), and in the State of NJ (DEP) (1985-1989).

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TUESDAY MORNING WORKSHOP & PLATFORM SESSIONS

Session 1: 8:30am – 12:00pm, *Sierra 5*

Combining Remediation Technologies for Optimal Results

Session Chair: Rick Gillespie, Regenesis, San Clemente, CA



This session will focus on the use of combined or sequentially applied groundwater and soil remediation technologies in order to improve overall efficiency when compared to the use of a single technology alone. Combining remediation technologies allows the remediation practitioner to leverage the unique strengths of multiple technologies to treat a wide range of site conditions and contaminant concentrations.

8:30 Combined Remedy Synergies – Conceptual Road Map and Examples

Rick Gillespie, Regenesis, San Clemente, CA; Jeremy Birnstingl, Regenesis, Bath, UK

9:00 Combined Remedies New and Old – the Science Advances, but the Keys to Success Remain the Same

Kent Sorenson, CDM Smith, Denver, CO; Tamzen Macbeth, CDM Smith, Helena, MT

9:30 Multi-component Remedy for a Co-mingled Chlorinated Solvent and 1,4-Dioxane Source Area and Plume

Ryan Wymore, Geosyntec Consultants, Lafayette, CO; Theodore Kuehster, Garry Stanley, Jeff Kurtz, and David Folkes, Geosyntec Consultants, Greenwood Village, CO

10:00 BREAK

10:30 Title TBD

Catherine Regan, ERM, Boston, MA; Belinda Butler-Veytia, ERM, Greenwood Village, CO

11:00 Combined Technologies to Capitalize on Synergies, Reduce Overall Costs, and Expedite Remediation

Christopher Gale and Brian Hitchens, Geosyntec Consultants, San Diego, CA; Doug Riddle, RELLC, Mountain Center, CA

11:30 Microbes Adapt, So Why Shouldn't We?

Clint Bickmore, B Street Technology, Longmont, CO

Session 3: 9:00am – 12:00pm, *Santa Fe 3*

Naphthalene - The Emerging State of Its Science and Risk Assessment

Session Chair: Patrick Beatty, American Petroleum Institute, Washington, DC

9:00 There's Naphthalene In Our Fuels! Evaluations of Its Presence & Prevalence

John Hinz, USAFSAM/OEC - Retired, Schertz, TX

9:30 Air-Force Wide Occurrence of Naphthalene in Groundwater, Soil, and Other Media

Samuel Brock and Philip Hunter, Air Force Civil Engineer Center, JBSA Lackland AFB, TX

10:00 BREAK

10:30 Naphthalene: Possible Human Carcinogen? Results of a Multi-Year Research Effort

True-Jenn Sun, Chevron, San Ramon, CA; Fred Reitman, Shell Oil Company, Houston, TX; Patrick Beatty, American Petroleum Institute, Washington, DC; Anne Lehuray, Naphthalene Council, Inc., Alexandria, VA

11:00 Risk Assessment for Inhalation Exposure to Naphthalene

Fred Reitman, Shell Oil Company, Houston, TX

11:30 Panel Discussion

Session 2: 9:00am – 11:30am, *Salon G*

Energy

Session Chair: Meriah Arias-Thode, Naval SPAWAR Systems Center, Pacific, San Diego, CA

9:00 Renewable Energy Portfolios - What are They?

Paul MacGregor, Green Harbor Energy, Kennesaw, GA

9:30 Renewable Energy Production from DoD Installation Solid Waste by Anaerobic Digestion

Tyler Miller, CDM Smith, Denver, CO; Dave Parry and Patrick Evans, CDM Smith, Bellevue, WA

10:00 BREAK

10:30 Water Conservation Effects on Navy Energy Use, Drinking Water, and Wastewater Systems

Alexander Kohnen and Len Sinfield, U.S. Navy, Naval Facilities Engineering Command, San Diego, CA

11:00 Wind Turbines - Do They Pose a Threat to Human Health

Christopher Olson, Loren Knopper, Lindsay McCallum, Melissa Whitfield Aslund, and Robert Berger, Intrinsik Environmental Sciences, Mississauga, ON, Canada; Mary Mcdaniel and Kathleen Souweine, Intrinsik Environmental Sciences, Venice, CA

LUNCHEON SPEAKER

Tuesday, March 24, 2015 12:00pm – 1:30pm, *Cabrillo*

Achieving the Vision for a Low-Carbon Grid



Frank Lindh, Partner, Crowell & Moring, LLP, San Francisco, CA

In California, the discussion of grid transformation has been underway for a number of years, but things really began to gel during 2014. Beginning in 2015, the initiatives the State put in motion will be significantly influential in the electricity sector in California and throughout the West for years to come. The California Independent System Operator implemented the first west-wide market in November 2014 with its energy imbalance market that allows efficient use of the transmission system and renewable generation across 6 western states; California's policy on storage procurement has begun to produce significant quantities of storage under contract on distribution systems, with more to come in 2015; California has made significant progress in replacing capacity in the LA basin following the permanent closure of the San Onofre Nuclear Generating Station; and California continues to make strides in promoting renewable energy resources, both large scale and small scale. These recent developments will create opportunities and force changes in business models across the electric industry. This talk will address the implications as well as the impact on consumers and ratepayers.

Workshop 1, continued 8:30am – 12:00pm, *Pavilion*

Vapor Intrusion (VI) Exposures – Long-Term Evidence-Based Protection & Sustainability, Part II

Since 2004, the USEPA has sponsored annual Vapor Intrusion (VI) Workshops at the AEHS Foundation's Annual International West Coast Conference in San Diego, CA. This year's technical workshop, which will be held over two successive half-day sessions, is focused on the latest scientific observations and evidence regarding the efficacy of various management approaches for providing long-term (sustainable) evidence-based protection. Commonly VI risks are presented by contaminated groundwater sources, and the long-term evidence-based approaches and degree of certainty expected for groundwater ingestion exposures (e.g., NRC 2012*) will be compared with those currently typical for the VI pathway's inhalation exposures. The evidence and scenarios considered will range from the simplest pre-construction and existing residential settings, to more complicated residential scenarios and the typically even-more variable non-residential scenarios. Residential scenarios will include the latest data from two of the world's most thoroughly studied VI-research houses (and consideration of their representativeness) along with studies that illustrate the building-specific complexities that are often only observable after applying physical intrusion controls/diagnostics to a given building. Finally, because "there are two choices for dealing with a possible vapor intrusion pathway at a given site: (1) invest in sampling and analyses to confirm whether or not the potential exposure is of concern, or (2) install a vapor mitigation system,"* this workshop will continue the discussion from our 2014 workshop by presenting the latest scientific and economic evidence for informing such a decision, likely made more efficient by an earlier awareness of the long-term stewardship obligations that can become more obvious with time. Also note that in response to numerous 'too much information in too little time to discuss' comments from our previous workshops, this split-day format will allow an optional informal evening discussion session that is being planned for all technical topics, including impacted-community stakeholder groups' comments and perspectives.

*Alternatives for Managing the Nation's Complex Contaminated Groundwater Sites, NRC 2012. <http://www.nap.edu/catalog/14668/alternatives-for-managing-the-nations-complex-contaminated-groundwater-sites>



Session 1: 1:30pm – 5:30pm, *Sierra 5*

Bioremediation

Session Chair: **Stephen Mezyk**, California State University at Long Beach, Long Beach, CA

1:30 Improved ISCR Reagent for Safer, More Efficient Remedial Actions

Jim Mueller, Provectus Environmental Products, Freeport, IL; Mike Scalzi and Wade Meese, IET, Pipersville, PA; Sidney Aluani and Eduardo Pujol, SGW Services, Sao Paulo, Brazil

2:00 Biogeochemical Transformation of Chlorinated Solvents

Patrick Evans, CDM Smith, Bellevue, WA

2:30 Effect of Biosurfactants on Motility of Bacteria Under Heavy Metal Stress

Zhiwen Zhu, Baiyu Zhang, Bing Chen, Weiyun Lin, and Xing Song, Memorial University of Newfoundland, St. John's, Newfoundland and Labrador, Canada

3:00 BREAK

3:30 Comparison of Natural Source Zone Depletion (NSZD) Characterization Methods

Steven Gaito, ARCADIS U.S., Inc., Braintree, MA; Andy Pennington, ARCADIS, Chicago, IL; Jonathon Smith, ARCADIS, Novi, MI; Brad Koons, ARCADIS, Minneapolis, MN; Harley Hopkins and Mark Malander, ExxonMobil Environmental Services Company, Fairfax, VA

4:00 Environmental Molecular Diagnostic Tools for Green Remediation

Yi Wang, Pace CSIA Center of Excellence, Pittsburgh, PA

4:30 Managing Geochemistry and Hydrogeology While Performing Anaerobic Bioremediation

Nick Amiri, Santa Ana Regional Water Quality Control Board, Riverside, CA; Mark Dockum, GHD, San Francisco, CA; Gary Birk, Tersus Environmental, Wake Forest, NC; John Sankey, True Blue Technologies, Long Beach, CA

5:00 Evaluation of the Potential Impacts of Trichloroethene In-Situ Bioremediation on Vapor Intrusion at a Northern California Site

Anja Verce and Mary Stallard, Weiss Associates, Emeryville, CA

Session 3: 1:30pm – 4:30pm, *Santa Fe 3*

Constituents of Emerging Concern

Session Chair: **Helen Yu**, San Diego Regional Water Quality Control Board, San Diego, CA

1:30 Reactivity of Chlorine Radicals and Chloramines with Wastewater Constituent Species

Kylie Couch and Stephen Mezyk, California State University Long Beach, Long Beach, CA

2:00 Removing Carcinogenic Nitrosamines from Contaminated Waters

Brittany Daws and Stephen Mezyk, California State University Long Beach, Long Beach, CA

2:30 Sampling and Analytical Considerations for Management of Data Quality for poly- and perfluorinated alkyl substances (PFASs) in Groundwater

Ann Bernhardt, AMEC Foster Wheeler, Portland, OR; Marie Bevier and Sean Gormley, AMEC Environment & Infrastructure, Portland, OR; Melissa Helton, AMEC Environment & Infrastructure, Knoxville, TN; Shalene Thomas, AMEC Environment & Infrastructure, Minneapolis, MN; Robert Singer, AMEC Environment & Infrastructure, Portland, ME; Bethany Flynn, AMEC Environmental & Infrastructure, Petaluma, CA

3:00 BREAK

3:30 In Situ Thermal Remediation of 1,4-Dioxane and Advances in Heat Enhanced Bioremediation

John Sankey, True Blue Clean, Inc., Richmond, BC, Canada; Dan Oberle, TRS Group, Inc., Longview, WA

4:00 Synthetic Media Remediation System Achieves Consistent Compliance with Evolving Massachusetts 1,4-Dioxane Permit Limits

Steve Woodard, ECT, Portland, ME; Louis Burkhardt, Raytheon Company, Billerica, MA

Session 2: 1:30pm – 5:00pm, *Salon G*

Hydraulic Fracturing – Regulatory and Technical Update

Session Chair: **Sam Williams**, Geosyntec Consultants, San Diego, CA

1:30 Laws and Regulations Governing Hydraulic Fracturing

John Borkovich, State Water Resources Control Board, Sacramento, CA

2:00 Legal Perspective and Recent Litigation Related to Hydraulic Fracturing

Charles Correll, King & Spalding, San Francisco, CA

2:30 Human Health and Environmental Issues Surrounding Hydraulic Fracturing: A Canadian Perspective

Donald Davies and Thia Sterling, Intrinsic Environmental Sciences, Calgary, Alberta, Canada

3:00 BREAK

3:30 Evaluating Key Sources of Groundwater Quality Variability in Residential Water Wells for Pre-Drill Sampling

Stephen Richardson and Ann P. Smith, GSI Environmental, Inc., Austin, TX; Lisa J. Molofsky and John A. Connor, GSI Environmental, Inc., Houston, TX

4:00 Hydraulic Fracturing for Oil and Gas Production in California - Water Use and Water Quality Issues

Eric Nichols, Substrata, Newfields, NH; Thomas Johnson, Thomas Johnson Associates, Sausalito, CA; Scott Seyfried, ARCADIS U.S., Inc., Roseville, CA; Fred Stanin, ARCADIS U.S., Inc., Emeryville, CA

4:30 North American Shale Development – From a Business & Regulatory Perspective

Charles Whisman, CH2M Hill, Philadelphia, PA

Session 4: 1:30pm – 5:30pm, *Pavilion*

Technology Advancements in Remediation Science

Session Chair: **Stephen Koenigsberg**, Brown and Caldwell, Irvine, CA

Brown
AND
Caldwell

1:30 Lessons Learned from Two Decades of Using Molecular Biological Tools for Site Investigations and Treatment

Dora Ogles, Anita Biernacki, and Brett R. Baldwin, Microbial Insights, Inc., Knoxville, TN

2:00 Advances in In-Situ Injection and Monitoring Technologies

Gary Cronk, JAG Consulting Group, Santa Ana, CA

2:30 Remediation of PCBs and 1,4-Dioxane with an Aerobic Bacteria and its Cell-Free Extract

Stephen Koenigsberg, Brown and Caldwell, Irvine, CA; Raymond Sambrotto, Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY; Kevin O'Driscoll, Robert M. DiFilippo, and Paul Piccillo, Thermocyclomics LLC, New York, NY; Joseph Guarnaccia, BASF, Toms River, NJ

3:00 BREAK

3:30 Characterizing Preferential Flow Paths in Fractured Bedrock and Complex Hydrogeology

Leif Law, Willowstick, Draper, UT

4:00 Passive Electrochemical Remote Sensing

Scott Burge, Burge and Associates, Tempe, AZ; Russell, G. Burge, Freeslate, Inc., Sunnyvale, CA

4:30 Reducing Environmental Liabilities and Preserving Sustainable Water Supplies through Automation

Mark Kram and Clifford Frescura, Groundswell Technologies, Inc., Goleta, CA; Hugo Loaiciga, University of California at Santa Barbara, Santa Barbara, CA; Michael Lamar, Abbaroo.com, Felton, CA

5:00 Reduction, Adsorption, and Precipitation of Heavy Metals by Elemental Iron, Iron Sulfides, and Related Reactive Minerals

Alan Seech, PeroxyChem Environmental Solutions, Corona Del Mar, CA; Paul G. Tratnyek, OHSU Institute of Environmental Health, Portland, OR

Posters may be viewed on their assigned day on Tuesday, March 24th or Wednesday, March 25th (see schedule below). Posters may be viewed independently throughout the day and authors will be available for individual discussion at their posters from 3:00pm – 6:00pm on their assigned day. Please refer to the schedule below. Refreshments and light hors d' oeuvres will be available during the poster sessions.

The following posters will be presented on Tuesday only – Foyers & Sunroom

Green House Gases (GHGs) Management in Kuwait Oil Company (KOC)

Ibrahim AlSayed, Rasha Al-Wazan, and R.Y. Parisudda Rao, Kuwait Oil Company, Ahmadi, Kuwait

Model Development for Predicting Temporal Characteristics of Leachate from LNAPL Contaminated Soil

Mohammad Al-Suwaiyan, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

Effect of Hydrogel Amendment on Growth and Survival of Plants in Two Types of Soils

Isam Bashour, Jessica El Asmar, Hadi Jaafar, and Mohammad Farran, American University of Beirut, Beirut, Lebanon

Remediation of Chlorinated Solvents in Groundwater and Soil Gases using Site-wide Pseudo-convective Transport Processes

Edward Council and Christopher Council, Advanced Geologic Sciences, Xenia, OH

Photovoltaic Solar Cooling in Regions With High Solar Irradiation: A Case Study

Muhammed Emin Tolu and Mehmet Numan Kaya, Karamanoglu Mehmetbey University, Karaman, Turkey

Investigation & Evaluation of Subsurface Anthropogenic Preferential Pathways

Aaron Friedrich, Environmental Resources Management, Inc., Carmel, IN

Sustainable Reuse of Treated Soil after Ex Situ Gas Thermal Remediation: Implications for TPH Impacted Sludge or Soils

Grant Geckeler, Lowell Kessel, and Carol Winell, GEO, Corona, CA

Ozone Sparging for Large Scale Remedial Design

Kevin Gomes, H2O Engineering, San Luis Obispo, CA

Site-Specific Radon Risk Assessment at a Temporary Housing Development in Kansas

Megan Hamilton and Jeffrey Carnahan, EnviroForensics, Indianapolis, IN

Case Study – Passive TO-17 Indoor Air Sample Results Compared to TO-15 Indoor Air Summa Canister Sample Results over a 6 Month Time Period

Megan Hamilton and Grace Randall, EnviroForensics, Indianapolis, IN; Travis Garrett, EnvisionAir, Indianapolis, IN

Turning a Brownfield into a Health Center

Kathleen Kerigan, Jessica Yeager, and Russell Parkman, GZA GeoEnvironmental, Inc., Norwood, MA; Frank Vetere, GZA GeoEnvironmental, Newburyport, MA

High-Res Site Characterization - LNAPL Case Study

Kathleen Kerigan, Jessica Yeager, Albert Ricciardelli, and Patrick Sheehan, GZA GeoEnvironmental, Inc., Norwood, MA

Hot Soil Vapor Sampling and Analysis - Post-ISTT

Kathleen Kerigan, Jessica Yeager, Maryann Sapanara, Albert Ricciardelli, and Patrick Sheehan, GZA GeoEnvironmental, Inc., Norwood, MA

Differential Gene Expression of Metallothioneins in Mesquite Plants (*Prosopis glandulosa*) Treated with Cadmium and Copper

Claudia Michel-López and Daniel Gonzalez-Mendoza, Universidad Autónoma de Baja California, Mexicali, Mexico; Jorge Rubio-Piña and Omar Zapata-Perez, Centro de Investigación y de Estudios Avanzados del IPN, Yucatán, México

Using Solar-Powered Mixing Devices to Enhance the Raw Water Quality of a Lake

April Nabors, Birmingham Water Works Board, Birmingham, AL

Assessment of Water Quality by Determining the Diversity and Abundance of Benthic Macro-Invertebrates in the Nima Creek in Ghana

Linda Akosua Nuamah and Jingyu Huang, Hohai University, Nanjing, China; Hederick Rosevelt Dankwa, CSIR-Water Research Institute, Accra, Ghana

Renewable Energy Powered Rural Irrigation: Feasibility Comparison of Solar and Wind Based Water Pumping Systems In Turkey

Mehmet Numan Kaya, Karamanoglu Mehmetbey University, Karaman, Turkey; Faruk Köse, Selcuk University, Konya, Turkey

International Sites: Applying LNAPL Transmissivity Standard

Nidhi Patel, AECOM, Oakland, CA

Comparison of Various Regulatory Approaches for Human Health Risk Assessment of Total Petroleum Hydrocarbons in Soil

Kanan Patel-Coleman, URS Corporation, Los Angeles, CA

Microbial Profiling: Essential for Technology Selection, Remediation Evaluation/Troubleshooting

Jack Sheldon, Antea Group, West Des Moines, IA

Comparison of Abiotic and Biotic Degradation of TCP in Microcosm Studies

Michael Sieczkowski and Donovan Smith, JRW Bioremediation, LLC, Lenexa, KS

Health Impact Assessment: An Emerging Trend for Oil and Gas Projects in the US?

Kathleen Souweine and Mary Mcdaniel, Intrinsik Environmental Sciences, Venice, CA; Lindsay McCallum, Chris Ollson, and Bart Koppe, Intrinsik Environmental Sciences, Mississauga, ON, Canada

An Innovative Bioremediation Strategy for Treating Chlorinated VOCs in Low-Permeability Saturated Soils Using Specialized Jetting Techniques

Bill Walsh, Mei-Chin Yei, and Ed Alperin, EOS Remediation, Raleigh, NC; Susumu Uesawa, Chemical Grouting CO, Tokyo, Japan

WELCOME RECEPTION

Wine and Cheese Social 5:00 pm – 7:00 pm
Exhibit Hall, Salons A-F

(Free to all registered conference attendees)



Workshop 7 6:30pm – 9:30pm, *Sierra 5*

Assessment and Evaluation of Vapor Intrusion at Petroleum Release Sites

Robin Davis, Utah Department of Environmental Quality, Salt Lake City, UT
 Blayne Hartman, Hartman Geosciences, Solana Beach, CA
 Todd Ririe, BP, La Palma, CA
 George DeVaul, Shell Global Solutions, Houston, TX

This workshop will focus on presenting information and updates on the assessment and evaluation of vapor intrusion from subsurface sources into buildings from petroleum release sites. Topics to be covered include: 1) Conceptual site model for petroleum vapor intrusion (PVI) and the differences between petroleum and chlorinated solvent vapor intrusion; 2) Types and characteristics of sites where PVI may be an issue; 3) The API Biovapor model, and other models, as tools to evaluate PVI; 4) Use of exclusion criteria for screening potential PVI; 5) Sampling and analytical methods for PVI including lessons learned, and 6) Updates on guidance documents, including EPA OUST, ITRC, other states, and their impact on future PVI investigations.

Workshop 8 6:30pm – 9:30pm, *Salon G*

Nationwide Trends and Developments in Cleanup Levels for Petroleum Hydrocarbons in Soil

Bridgette DeShields, Integral Consulting Inc., Petaluma, CA
 Dawn A. Zemo, P.G., C.E.G., Zemo & Associates, Incline Village, NV
 Thomas Booze, Ph.D., California EPA, DTSC, Sacramento, CA

State agencies and U.S. EPA began regulating petroleum hydrocarbons in soil and groundwater more than 20 years ago. These initial regulatory frameworks relied on analyses of total petroleum hydrocarbons (TPH). From that simple beginning have come refinements that are based on identifying individual components of TPH, including benzene, toluene, ethylbenzene, and xylenes; polycyclic aromatic hydrocarbons; additives (e.g., lead, methyl tert-butyl ether, ethylene dibromide, ethylene dichloride); and eventually different hydrocarbon fractions. Screening and cleanup levels have also diversified to include a larger range of land uses and exposure pathways. The current trend is toward using fractionation data that cover the full spectrum of petroleum components. Not all states currently use fractionation approaches, and the ones that do have developed different approaches and ways of implementing them. Using data on state cleanup levels collected by the Association of Environmental Health and Sciences Foundation since 1990, combined with a survey of targeted states in 2014, this workshop will address the evolution of petroleum regulations at the state level and will compare current approaches across the country. Differences between approaches in use by U.S. EPA and various states will be discussed. Differences in the implementation of fractionation approaches and in the analytical methods in common use will be addressed, focusing on their impacts on remedial decision-making. One or more case studies for sites in California, Oregon, and Washington will be presented that illustrate how different approaches to regulating petroleum hydrocarbons will result in more or less stringent cleanup levels. This workshop will conclude with a discussion of trends observed across the country, and the likely future for the continued evolution of TPH cleanup levels. The current approach for assessing TPH in California developed by DTSC will be presented as well.

Workshop 9 6:30pm – 9:30pm, *Santa Fe 3*

Natural Resource Damage Assessment: Measuring Injury to Natural Resources for NRDA



Chairs:

Brenda Sanders, Principal, Integral Consulting, Petaluma, CA
 Ted Tomasi, Partner, ERM, Malvern, PA

Natural Resource Economics Panel:

Ted Tomasi (moderator), Partner, ERM, Malvern, PA
 Jeffrey Wakefield, Senior Consultant, Cardno, Newark, DE
 Adam Domanski, NOAA –Assessment and Restoration Division, Silver Springs, MD

Ecological Panel:

Gregory Reub (moderator), Principal, ENVIRON, Olympia, WA
 Mary Baker, NOAA- Assessment and Restoration Division, Seattle, WA
 Tony Palagyi, Senior Consultant, Cardno, Seattle, WA

Law Panel:

Andrew Davis (moderator), Shipman & Goodwin, Hartford, CT
 Gerald George, Partner, Davis Wright Tremaine LLP, San Francisco, CA
 Chris Plaisted, Attorney-Advisor, NOAA, Long Beach, CA

Natural Resource Damage Assessment (NRDA) under CERCLA and OPA evaluate the nature and extent of observable or measurable adverse change or impairment in a natural resource due to a release of oil or hazardous substances. The extent of these is quantified based on the cost of restoring the injured services to baseline conditions which existed prior to the release (primary restoration) or compensating the public for the loss of resources from the time of release to the time in which they recover to baseline conditions (compensatory restoration). Compensation may be scaled and monetized based on restoration projects which are generally consistent with those impacted by the release.

Federal regulations and common practice has focused on the ecological services provided by the habitats and resources affected by the release. These services may include specific ecological habitat (e.g., acres of estuarine wetlands) or specific species or groups of species (e.g., migratory bird species or marine mammals) that may have been impacted by the release. Recently it has been suggested that an ecosystems services (ESS) approach should be adopted which may include services that a functioning ecosystem provides to humans (e.g., the importance of wetlands in protecting against flooding).

This workshop will examine the relationship between the current NRDA practice, and the more recent ecosystem services approach. The central topics covered in this workshop will be: (1) the relationship between the current NRDA practice and ESS valuation; (2) the conditions under which methods that do not use monetized values (e.g., HEA/REA) provide the same restoration outcomes as full economic valuation; and (3) the information needs, tools and likely sources of errors of the various potential approaches. Topics will be addressed through panel presentations and discussions from an ecological, economic and legal perspectives. Each of the panels is comprised of practitioners from both the Responsible Party and Trustee perspective allowing for broad representation and lively discussion.

FREE This workshop is free of charge to all attendees. Registration is required. Please see registration desk to sign up. **FREE**

Session 1: 9:00am – 12:00pm, *Salon G* **Regulatory Perspectives on Site Closure Criteria**

Session Chair: Nick Amini, Santa Ana Regional Water Quality Control Board, Riverside, CA

Please note: This session follows a slightly different schedule. Speakers are scheduled every 20 minutes.

9:00 Michigan's Risk-Based Approach for Contamination Site Closure

Bob Wagner, Michigan Department of Environmental Quality, Kalamazoo, MI

9:20 Strategies for Site Resolution in Kansas

Chris Carey, Kansas DEH, Topeka, KS

9:40 Risk Based Investigations for Petroleum Leaksites in MN

Andrew Eddy and Mark Koplitz, Minnesota PCA, St. Paul, MN

10:00 BREAK

10:30 California UST Site Closure Criteria

Yue Rong, California RWQCB, Los Angeles, CA

10:50 Balancing Risk, Uncertainty, and Resource Realities

Kenny Dixon, US EPA Region 9, San Francisco, CA

11:10 Completion of Groundwater Restoration for Superfund Sites, Guidance, and Tools

Herb Levine, US EPA Region 9, San Francisco, CA

11:30 Panel Discussion

Session 3: 8:30am – 12:00pm, *Santa Fe 3* **Contaminants of Emerging Concern – Challenges, Perspectives and Risk Considerations**

Session Chair: Mike Ruby, Integral Consulting, Louisville, CO



Chemicals are being discovered in environmental media that previously had not been detected or are being detected at levels that may be significantly different than expected. These are often referred to as "contaminants of emerging concern" because the risk to human health and the environment associated with their presence, frequency of occurrence, or source may not be known. These knowledge-gaps present significant challenges for entities responsible for protecting human health and the environment. This session will discuss the current challenges, perspectives, and approaches to addressing concerns of emerging contaminants.

8:30 Contaminants of Emerging Concern: An Introduction to Technical, Programmatic, and Business Challenges to Environmental Management

Bridgette DeShields, Integral Consulting Inc., Petaluma, CA

9:00 EPA's Unregulated Contaminant Monitoring Rule Results (UCMR-3)

Richard Zimmer, Eurofins Eaton Analytical, Monrovia, CA

9:30 What Do the UCMR-3 Results Tell Us About Emerging Contaminants in Drinking Water

Bruce Macler, U.S. EPA Region 9, San Francisco, CA

10:00 BREAK

10:30 Overview of Poly- and Perfluoroalkyl Substances Chemical Class and a Review of State and Federal Regulatory Guidance

Shalene Thomas, AMEC Foster Wheeler, Minneapolis, MN

11:00 Explaining the Widespread Occurrence of 1,4-Dioxane in Municipal Water Supplies

Thomas Mohr, Santa Clara Valley Water District, San Jose, CA

11:30 Emerging Contaminants in Consumer Products

Meredith Williams, California EPA, DTSC Safer Products and Workplaces Program, Sacramento, CA

SPECIAL SESSION

Session 2: 9:00am – 12:00pm, *Sierra 5*

Environmental Impact of Nanotechnology

Session Chair: Stephen Wall, Cal Dept of Public Health Laboratory, Richmond, CA

Comprehensive overview of risk management, environmental implications, exposure toxicology, and nano-regulatory policy, including a lively panel discussion following the presentations by subject matter experts from Stanford University, UC Santa Barbara, UC Irvine, and Environmental Law Firm RMKB.

9:00 Risk Management of Emerging Technologies

Lawrence Gibbs, Stanford University, Stanford, CA

9:30 Emerging Trends in the Environmental Implications of Nanotechnology

Arturo Keller, University of California, Santa Barbara, CA

10:00 BREAK

10:30 Reducing Nanoparticle Exposure and Health Effects from Machining of Carbon Composite Materials

Michael Kleinman, Samantha Renusch, and David Herman, University of California, Irvine, CA; Jeffrey Miller and Ramulu Mamidala, University of Washington, Seattle, WA

11:00 Emerging Nanotechnology Regulatory, Enforcement and Potential Liabilities

Tim Agajanian, Ropers, Majeski, Kohn & Bentley, Los Angeles, CA

11:30 Panel Discussion

Session 4: 8:30am – 12:00pm, *Pavilion*

Petroleum Hydrocarbon Vapor Intrusion I

Session Chair: Todd Ririe, BP, La Palma, CA

8:30 Back to the 1980's for Products Liability and Environmental Litigation

Kevin Mayer, Crowell & Moring LLP, Los Angeles, CA

9:00 Speciation of C5 to C12 Aliphatic Hydrocarbons and C6 to C12 Aromatic Hydrocarbons using EPA method 8260 for Vapor Intrusion Risk Assessment Evaluations

Steve Jones, Jones Environmental, Santa Fe Springs, CA

9:30 Comparative Study of Indoor Air Databases and the Veracity of "Background"

Robin DeHate, GEI Consultants, Inc., Valrico, FL; Brian Skelly, GEI Consultants, Inc., Glastonbury, CT

10:00 BREAK

10:30 Vapor Intrusion Evaluation at LUFT Sites with the Lead Scavenger Ethylene Dichloride (EDC) in Groundwater

Thomas Rejzek and Paul Mccaw, Santa Barbara County Public Health Department, Santa Maria, CA

11:00 Updating Site Conceptual Models for Potential Sewer Gas and Vapor Intrusion into Indoor Air from Breached Sewer Conveyance Systems

James Jacobs, Clearwater Group, Point Richmond, CA

11:30 Soil Vapor Reproducibility in Duplicate and Purge Volume Test Samples

Suzie Nawikas, H&P Mobil Geochemistry, Carlsbad, CA

LUNCHEON SPEAKER

Wednesday, March 25, 2015 12:00pm – 1:30pm, *Cabrillo*

Pollution Prevention through Safer Consumer Products: Using Green Chemistry to Protect Air, Water, and Soil

Meredith Williams, Deputy Director, Department of Toxics Substances Control, Sacramento, CA

California's Safer Consumer Products regulations were adopted to reduce toxic chemicals in the products consumers buy and use. It identifies specific products containing potentially harmful chemicals and asks manufacturers to answer two questions: 1) Is this chemical necessary? 2) Is there a safer alternative? The program represents a paradigm shift in toxics regulation. It calls for manufacturers to undertake precautionary approaches rather than relying on after-the-fact regulatory actions and moves protections upstream to product design. The Safer Consumer Products program's foundation in green chemistry encourages hazard reduction rather than risk management; aims toward broad protection against impacts to air, water, and soil rather than focusing exclusively on human health impacts; and fosters proactive pollution prevention approaches rather than reactive pollution remediation actions. Dr. Williams will present an overview of the regulations will recount what's been accomplished. She will discuss lessons learned during the first year of implementation of these landmark regulations and what to expect in the coming three years.



Meredith Williams joined the Department of Toxic Substances Control in December 2013. Her career has spanned R&D and product management for Fortune 500 technology, consumer product, and chemical companies including Applied Materials and 3M. Subsequent to a career in semiconductors, she joined the San Francisco Estuary Institute, a nationally-recognized center for science in support of aquatic resource management. Dr. Williams strives for collaborative solutions to complex problems in the application of science to policy and decision making. She holds a B.S. from Yale University and a Ph.D. in physics from North Carolina State University.

Session 1: 1:30pm – 5:00pm, *Salon G*

Regulatory Programs & Policies

Session Chair: Bruce Macler, USEPA, San Francisco, CA

1:30 Corrective Actions for the Port Angeles Landfill Potential Failure into the Strait of Juan de Fuca

Tom Bourque, Geotek, Inc., Hayden, ID

2:00 Integrated Water Resources Management of the Iullemeden-Taoudeni/Tanezrouft Aquifer Systems Along with the Niger River

Daniel Pierre, Antea Group, France, Olivet, France; Christian Eberschweiler, Antea Group, France, Arcueil, France

2:30 EPA's Failed Efforts to Regulate Nutrient Discharges – The Florida Experience

Kenneth Oertel, Oertel, Fernandez, Bryant & Atkinson, P.A., Tallahassee, FL

3:00 BREAK

3:30 Current Status of Water Quality Criteria Updates, Including a Comparison of Key Assumptions and Trends

Michael Ruby, Integral Consulting Inc., Louisville, CO; Ellen Ebert, Integral Consulting Inc., Portland, ME; Priscilla Tomlinson, Integral Consulting Inc., Seattle, WA

4:00 Closer Consideration of Assumptions Used to Derive Water Quality Criteria

Jennifer Sampson and Priscilla Tomlinson, Integral Consulting Inc., Seattle, WA; Mala Pattanayek, Integral Consulting Inc., Larkspur, CA; Joanna Shoenfelt, Integral Consulting Inc., Annapolis, MD

4:30 Evaluation of Perfluorochemicals (PFCs): Regulations, Analytical Methods and Risk Assessment

Usha Vedagiri and Dan Kim, AECOM, Oakland, CA; Cybele Heddle, EHS Support Ltd., Melbourne, Australia; Victoria Lazenby, Senversa, Southbank, Australia; Sandra Smith, AECOM, Austin, TX; Simon Cole, AECOM, Cardiff, United Kingdom

Session 3: 1:30pm – 4:30pm, *Santa Fe 3*

Remediation

Session Chair: Richard Vogl, Waterstone Environmental, Inc., Anaheim, CA

1:30 Hexavalent Chromium Contamination: Emergency Measures

John Donatucci, Michael Counte, and Paolo Dizon, Kleinfelder, Irvine, CA; Bill Golightly, Kleinfelder, San Diego, CA

2:00 Study on the Effectiveness of Spent Waste Sugarcane Bagasse for Adsorption of Different Petroleum Hydrocarbons Water Pollutants: Kinetic and Equilibrium Isotherm

Nour El-Gendy and Hussein N. Nassar, Egyptian Petroleum Research Institute, Cairo, Egypt

2:30 Rapid Remediation by In Situ Gas Thermal Remediation at Dry Cleaner Contaminated Sites

Grant Geckeler, Lowell Kessel, and Carol Winell, GEO, Corona, CA

3:00 BREAK

3:30 Progress in the Remediation of Petroleum Hydrocarbons and Oxygenates in California Groundwater

Thomas McHugh, Sharon Rauch, Shawn Paquette, and John Connor, GSI Environmental, Houston, TX; Anthony Daus, GSI Environmental, Newport, CA

4:00 Reacting to Changing Site Conditions: Reevaluating Remedial Alternatives, From Soil Vapor Extraction to In-Situ Chemical Oxidation

Melissa Spitzmiller, ARCADIS U.S., Inc., Long Beach, CA; Dwayne Campeau, ARCADIS U.S., Inc., Irvine, CA

Session 2: 1:30pm – 4:30pm, *Sierra 5*

Environmental Forensics

Session Chair: Ioana Petrisor, Great Ecology, San Diego, CA

1:30 Evaluation of Observed VI Attenuation Factors and Exposure for 50 Commercial Facilities in the Midwest

Megan Hamilton and Grace Randall, EnviroForensics, Indianapolis, IN; Travis Garrett, EnvisionAir, Indianapolis, IN

2:00 Assessing Limited Water Resources - Water Resources Forensics

Adam Love, Roux Associates, Oakland, CA; Andy Zdon, Andy Zdon and Associates, Walnut Creek, CA

2:30 Forensics Assessment Using $\delta^{13}C$ and $\delta^{37}Cl$ at a Site Impacted with Tetrachloroethene and Trichloroethene

Robert Pirkle and Patrick McLoughlin, Pace Analytical Energy Services, Pittsburgh, PA

3:00 BREAK

3:30 Evaluation of Manufactured Gas Plant PAH Contamination using Statistical Visualization: Finding Keys to Process Descriptions and Contaminant Sources

Michael Wade, Wade Research, Inc., Marshfield, MA

4:00 Identification of Microplastics in Fish as a Toxic Chemical Exposure Pathway Using Microspectroscopy and Electron Microscopy

Stephen Wall, Jeff Wagner, Sutapa Ghosal, and Zhong-Min Wang, California Department of Public Health, Richmond, CA

Session 4: 1:30pm – 5:30pm, *Pavilion*

Petroleum Hydrocarbon Vapor Intrusion II

Session Chair: Todd Ririe, BP, La Palma, CA

1:30 Beyond the Guidance – A Summary of the ITRC PVI Guidance Document and How it was Developed

Catherine Regan, ERM, Boston, MA; Matthew A. Lahvis, Shell Global Solutions (US), Inc., Houston, TX

2:00 Approach to Determining Enough Data to Assess VI

Jackie Wright, Environmental Risk Sciences Pty Ltd., Carlingford, NSW, Australia

2:30 A 'Conservative' Biodegradation Model of Petroleum Vapour and Oxygen Under Buildings

Greg Davis, CSIRO, Wembley, Western Australia; John H. Knight, University of Sydney, New South Wales, Australia

3:00 BREAK

3:30 The Effect of Pressure-Driven Flow on Petroleum Vapor Intrusion

George DeVaul, Shell Global Solutions, Houston, TX

4:00 Comparison of Biovapor and Johnson and Ettinger (J&E) Model Predictions to Field Data for Multiple Sites

Ian Hers, Golder Associates, Burnaby, BC, Canada

4:30 Evaluating Methods of Purging and Sampling to Determine Representativeness of Soil Vapor Data

Robin Davis, Utah Dept. of Environmental Quality, Salt Lake City, UT

5:00 Use of Vapor and Temperature Measurements from Monitoring Wells to Identify Depth and Rate of Biodegradation in Vadose Zone Soil

Robert Sweeney, Petroleum and Environmental Geochemistry, Etna, CA

Session 5: 3:30pm – 5:30pm, *Cabrillo*

California Brownfields Reuse and Transactions

Session Chair: Avram Frankel, Integral Consulting, San Francisco, CA



Introduction and Overview

Avram Frankel, Integral Consulting, San Francisco, CA

Private Sector Perspectives in a Post-Redevelopment Agency World

Markus Niebanck, EnviroFinance Group, Emeryville, CA

Legal Considerations Related to Redevelopment of Contaminated Property in California

Richard Opper, Opper & Varco LLP, San Diego, CA

The Role Local Government Can Play in Facilitating the Reuse and Redevelopment of Brownfield Properties

Eric Crockett, City of Chula Vista, Chula Vista, CA

Polanco 2.0 – a Regulatory Perspective

John Anderson, San Diego Regional Water Quality Control Board, San Diego, CA

Insurance Tools to Support Redevelopment

Greg Schilz, AON Risk Services, San Francisco, CA

WEDNESDAY AFTERNOON POSTER PRESENTATIONS

Posters may be viewed on their assigned day on Tuesday, March 24th or Wednesday, March 25th (see schedule below). Posters may be viewed independently throughout the day and authors will be available for individual discussion at their posters from 3:00pm – 6:00pm on their assigned day. Please refer to the schedule below. Refreshments and light hors d' oeuvres will be available during the poster sessions.

The following posters will be presented on Wednesday only – Foyers & Sunroom

Impact of Phosphate Mining Activities on Airborne Particulate Concentrations in North Saudi Arabia

Abdulaziz Alharbi, Qassim University, Buraydah, Saudi Arabia

Removal of As (III) Present in Matrices Aqueous Models using Binary Composites of Montmorillonite-nZVI type: Effects of the Coating Degree

Nicolás Arancibia-Miranda, Pamela Sepúlveda, Jonathan Suazo, Karen Manquían, and María Angélica Rubio, Universidad de Santiago de Chile, Santiago, Chile; Daniela Muñoz, Universidad de Chile, Santiago, Chile

Highly Successful ERD Pilot Study in Residual DNAPL Utilizing a Simple Additive Delivery Approach

Kent Armstrong, BioStryke Remediation Products LLC, Andover, NH; I. Richard Schaffner, Pennoni Associates, Haddon Heights, NJ

Phytoremediation of Heavy Metals Contaminated-Soil by Chromolaena odorata (L) King and Robinson Treated with Vermicompost

Harrison Atagana, University of South Africa, Pretoria, South Africa

Horizontal Environmental Drilling 101 – An Introduction to the Means and Methods for Horizontal Environmental Well Installation

David Bardsley, Directed Technologies Drilling, Inc., Bellefonte, PA; Michael Lubrecht, Directed Technologies Drilling, Inc., Bremerton, WA

Knock Off Blind Wells – An Innovative Method to Complete Single Ended Horizontal Environmental Wells

David Bardsley and Dan Ombalski, Directed Technologies Drilling, Inc., Bellefonte, PA

Heavy Metals Transport in Depth and Chemical Forms Distribution in Volcanic Soils Treated with Sewage Sludge

Mauricio Escudey, Nicolas Arancibia, and Carmen Pizarro, Universidad de Santiago de Chile, Santiago, Chile

Efficiency of Zeolite-Nanomagnetite Composites in the Arsenate Remotion from Aqueous Solutions

Mauricio Escudey, Carmen Pizarro, Daniela Muñoz, and María Angélica Rubio, Universidad de Santiago de Chile, Santiago, Chile

In-situ Chemical Oxidation and Bioremediation of Groundwater in Challenging Lithologic and Groundwater Conditions

Jude Francis, AECOM, Los Angeles, CA

Natural Source Zone Depletion Evaluations at a Capped Site: Limitations in Current Quantification Methods

Steven Gaito, ARCADIS U.S., Inc., Braintree, MA; Brad Koons, ARCADIS, Minneapolis, MN; Grant Trigger, RACER Trust, Detroit, MI

Demonstrating Natural Source Zone Depletion of LNAPL as a Remedial Alternative

Steven Gaito, ARCADIS U.S., Inc., Braintree, MA; Erica Whiting, ARCADIS U.S., Seattle, WA; Elizabeth Cohen, ARCADIS U.S., Novi, MI

How Do You Get Out of the Product Recovery Loop? Naturally Sustainable LNAPL Source Control

Steven Gaito, ARCADIS U.S., Inc., Braintree, MA; James Gonzales, ARCADIS U.S., Irvine, CA; Erica Whiting, ARCADIS U.S., Seattle, WA

Lifecycle of the CDOT Materials Testing Laboratory Remediation Project: An Example of Adaptive Remedial Design and Optimization

Kim Heinze and Jesse Manley, ARCADIS U.S., Inc., Highlands Ranch, CO; Craig Divine, ARCADIS US, Irvine, CA; Scott Andrews, Essential Management Solutions, Evergreen, CO; Theresa Santangelo-Dreiling, Colorado Department of Transportation, Golden, CO

Assessing the Environmental Impacts of Agricultural Subsidy in the Mississippi Delta Region Using GIS

Edmund Merem, Peter Isokephi, Joan Wesley, Shayron Thomas, Yaw Twumasi, Siddig Fageir and Marshand Crisler, Jackson State University, Jackson, MS

Virus and Trace Organic Compound Treatment Using Ozone in Potable Water

Robert Moncrief, H2O Engineering, San Luis Obispo, CA

Contour Maps, Preparation, Interpretation, Forensic Perspective

Mehmet Pehlivan, Bays Environmental Remediation Management, Ladera Ranch, CA

Lipid Tracers for Organic Matter in Surface Soils from Riyadh City, Saudi Arabia

Ahmed Rushdi, Khalid Al-Mutlaq, Aarif El-Mubarak, Mohammed Al-Saleh, Mubarak El-Otaibi, King Saud University, Riyadh, Saudi Arabia; Bernd Simoneit, Oregon State University, Corvallis, OR

Continued Decline in Volatile Organic Compound Concentrations in Groundwater following Electrical Resistance Heating Remediation

John Sankey, True Blue Technologies Inc., Richmond, BC, Canada; Tom Powell, TRS Group, Inc., Longview, WA

Chemical Fixation of Priority Heavy Metals in Soil, Sediment, and Groundwater using MetaFix™ Reagents

Alan Seech, PeroxyChem Environmental Solutions, Corona Del Mar, CA; Daniel Leigh, PeroxyChem Environmental Solutions, Walnut Creek, CA

Surfactant Enhanced Remediation Technologies

Dan Socci, Jennifer Holcomb, and Geeta Dahal, EthicalChem, South Windsor, CT

Surfactant-Enhanced Product Recovery (SEPR™) for Creosote Remediation

Dan Socci, Geeta Dahal, and George Hoag, EthicalChem, South Windsor, CT

A Kaleidoscopic Investigation: How Seven Fluorescent Tracers Were Used to Determine Connectivity between Aquifers

Ben Stanphill, Craig Divine, and Robert Ruscitto, ARCADIS U.S., Irvine, CA; Jeff Mcdonough, ARCADIS U.S., San Francisco, CA

Building a Vapor Intrusion Case: Use of Multiple Lines of Evidence to Support a Site Conceptual Model for TCE Migration Under a Residential Neighborhood

Nadine Weinberg, ARCADIS U.S., Portland, ME; Katherine Eyre and Darren Scillieri, Newtown, PA

Treatment of Arsenic by Chemical Fixation/Stabilization

Alan Weston, GHD, Wellington, FL; Christa Bucior, Sophia Dore, and Donald Pope, GHD, Niagara Falls, NY

EVENING SOCIAL



5:00 pm – 7:00 pm
Exhibit Hall, Salons A-F

(Free to all registered conference attendees)



Session 1: 9:00am – 12:00pm, *Sierra 5*

Environmental Fate and Modeling

Session Chair: Gary Foote, Terra Pacific Group, San Francisco, CA

9:00 Selenium Hydrogeology, Swamp of the Frogs, Newport Bay Watershed, Orange County, California

John Dodge, Daniel B. Stephens & Associates, Inc., Newport Beach, CA; Greg Schnaar and Stephen Cullen, Daniel B. Stephens and Associates, Inc., Santa Barbara, CA; Jian Peng, OC Watersheds, Orange, CA

9:30 LNAPL Mobility Assessment in Risk Based Site Closure

Kathleen Kerigan, Patrick Sheehan, and Albert Ricciardelli, GZA GeoEnvironmental, Inc., Norwood, MA

10:00 BREAK

10:30 Measured vs Modeled Uptake of Metals in Plant Tissue

Diana Marquez and Sharon Shelton, Burns & McDonnell Engineering Company, Inc., Kansas City, MO

11:00 Potential Aquatic Toxicity of Petroleum Biodegradation Metabolites Using Groundwater Samples at Fuel Release Sites

Asheesh Tiwary, Chevron ETC, Houston, TX; Renae Magaw, Rachel Mohler, and Catalina Espino-Devine, Chevron ETC, San Ramon, CA; Dawn Zemo, Zemo & Associates, Inc., Incline Village, NV; Kirk O'Reilly, Exponent Inc., Bellevue, WA

11:30 Influence of Clays, Metal Oxides, and Organic Matter on the Adsorption of Newly Generated Biosurfactants onto Soil

Zhiwen Zhu, Pu Li, Baiyu Zhang, Bing Chen, and Qinghong Cai, Memorial University of Newfoundland, St. John's, Newfoundland and Labrador, Canada

Session 3: 9:00am – 12:00pm, *Santa Fe 3*

Innovative Remedial Technologies

Session Chair: Ryan Wymore, Geosyntec Consultants, Centennial, CO

9:00 Safe and Effective Use of Stabilized Hydrogen Peroxide for Cleanup of a Gasoline and Diesel Groundwater Plume, Silverdale, WA

Gary Cronk, JAG Consulting Group, Santa Ana, CA; Joe Rounds, Antea Group, Inc., Redmond, WA

9:30 Slow-Release Chemical Oxidants for In Situ Treatment of Dioxane and Chlorinated Solvents

Patrick Evans, CDM Smith, Bellevue, WA; Pamela Dugan, Carus Corporation, LaSalle, IL; Michelle Crimi, Clarkson University, Potsdam, NY

10:00 BREAK

10:30 Comparison of In Situ Chemical Reduction to Enhanced Reductive Dechlorination to Treat TCE

Daniel Leigh, PeroxyChem, Walnut Creek, CA

11:00 Accelerated Biodegradation of Petroleum and Chlorinated Contaminants by an In Situ Colloidal Biomatrix

Ben Mork, Kristen Thoreson, Stephanie Rittenhouse, and Joy Gravitt, Regenesis, San Clemente, CA

11:30 Vacuum Driven In-Well Air Stripping and Re-Circulation

Mehmet Pehlivan, Bays Environmental Remediation Management, Ladera Ranch, CA; Gordon Hinshalwood and Camila Israel, Antea Group, Valhalla, NY

Session 2a: 8:30am – 10:00am, *Salon G*

Risk Assessment

Session Chair: Chuck Lambert, Intrinsik, Venice, CA

8:30 A Sensitivity Analysis of Input Parameters for Estimating Health Risks from Total Petroleum Hydrocarbons in Soil

Jane Curren and Kanan Patel-Coleman, URS Corporation, Los Angeles, CA; Usha Vedagiri, URS Corporation, Oakland, CA

9:00 What is the Source of Human PCB Body Burdens?

James Okun, O'Reilly, Talbot & Okun Associates, Inc., Springfield, MA

9:30 How to Redevelop a Brownfield Site Using California State Water Resources Control Board Resolution 92-49

Daniel Weis, Advantage Environmental Consultants, LLC, San Marcos, CA; Mike Palmer, De Maximis, Inc., San Diego, CA; Barry Pulver, San Diego Regional Water Quality Control Board, San Diego, CA

10:00 BREAK

Session 2b: 10:30am – 12:30pm, *Salon G*

Site Assessment

Session Chair: Chuck Lambert, Intrinsik, Venice, CA

10:30 SERDP Study Explores Well Flow Dynamics for Active and Passive Sampling

Sanford (Sandy) Britt, ProHydro, Inc., Fairport, NY

11:00 Reemergence of MTBE: Drought Conditions Exacerbating a Problem that Many Thought was in the Past

Lisa Dernbach, CA RWQCB, Lahontan Regiona, South Lake Tahoe, CA

11:30 Field Comparison of LNAPL Transmissivity Measurement Methods

Brad Koons, ARCADIS U.S. Inc., Minneapolis, MN; Jonathon Smith, ARCADIS, Novi, MI; Allison Elder, ExxonMobil Environmental Services Company, Houston, TX; Mark Malander and Harley Hopkins, ExxonMobil Environmental Service Company, Fairfax, VA

12:00 Incremental Sampling Strategies for Improving the Cost and Effectiveness of Site Investigations in Hawaii

Jordan Nakayama, Hawaii Department of Health, Honolulu, HI; Roger Brewer, State of Hawaii, Honolulu, HI; Paul Chong and John Peard, State of Hawaii, Hilo, HI; Robert Chong, Environmental Science International, Kailua, HI

Session 4: 8:30am – 12:00pm, *Pavilion*

Vapor Intrusion

Session Chair: Elizabeth Miesner, ENVIRON, San Francisco, CA

8:30 Site-Specific Groundwater Standards for the Vapor Intrusion Pathway

Helen Dawson, Geosyntec Consultants, Falls Church, VA; Jeff Kurtz, Geosyntec Consultants, Lafayette, CO

9:00 New Tools Address Risk, Liability, and Uncertainties Related to Vapor Intrusion & Provide Fast Track to Site Closure

David Gillay, Barnes & Thornburg LLP, Indianapolis, IN; Kyle Hoylman, Protect Environmental, Louisville, KY

9:30 Results from Continuous Monitoring of Chlorinated Solvent Vapors: Ramifications on Soil Gas, Sub-Slab Soil Gas and Indoor Air Sampling

Blayne Hartman, Hartman Environmental Geoscience, Solana Beach, CA

10:00 BREAK

10:30 Application of Passive Sorbent Techniques to the Measurement of Naphthalene in Indoor Air

Heidi Hayes and Diane Benton, Eurofins Air Toxics, Inc., Folsom, CA

11:00 The Hybrid Option for On-going Protection from Short-Term Risks with Episodic Chemical Vapor Intrusion

Henry Schuver, USEPA - ORCR, Washington, DC

11:30 Sampling Media, Analytical Methods, and Instrumentation used to Screen, Investigate, and Close Vapor Intrusion Sites – What is reliable and accurate?

Robert Uppencamp and Brian Cosky, ARCADIS U.S., Inc., Indianapolis, IN; Brian Schumacher and John Zimmerman, US EPA/ORD/NERL, Las Vegas, NV; Christopher Lutes, CH2M Hill, Raleigh, NC; Robert Truesdale and Robert Norberg, RTI International, Research Triangle Park, NC

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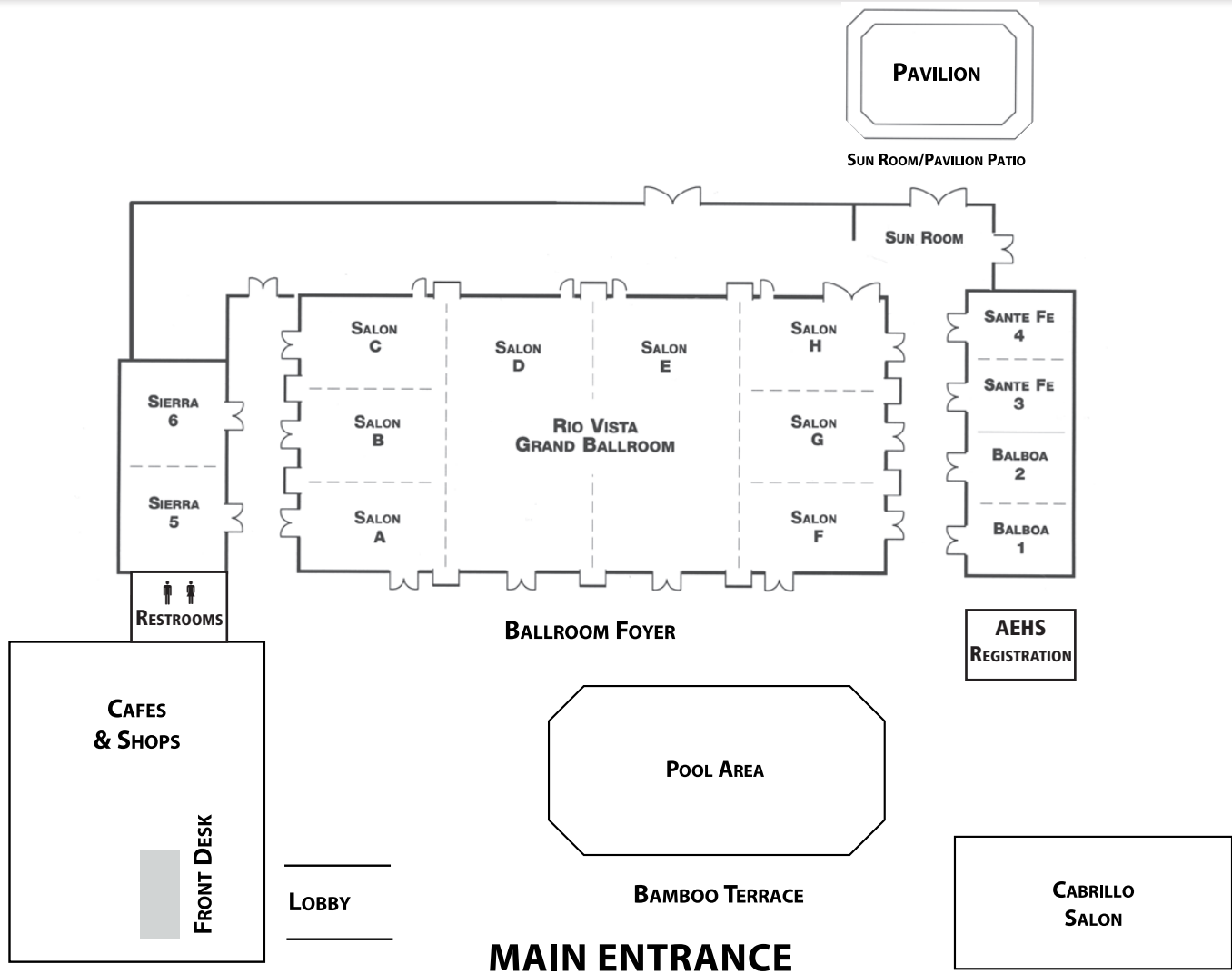
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