

Battelle's 12th International Conference on Remediation of Chlorinated and Recalcitrant Compounds

2022 Featured Platform Presentations

Monday, May 23, 2022

Session – A1. Emerging Remediation Technologies

- 1:00 PM** Simultaneous Treatment of Heavy Metals and Chlorinated Solvents in Groundwater
Primrose A *Seech, D. Leigh, F. Lakhwala and J. Molin*
Fayaz Lakhwala (Evonik/USA)

Tuesday, May 24, 2022

Session – A2. Abiotic and In Situ Biogeochemical Processes: Applications and Lessons Learned

- 10:05 AM** In Situ Geochemical Stabilization (ISGS[®]) of DNAPL: Bench-Scale and Pilot-Scale
Primrose A Demonstration Results
D. Gray, T. Vannest, S. Lucas, J. Mueller, G. Booth, C. Walecka-Hutchinson, T. Tambling, and J. Sprague
Doug Gray (AECOM/USA)
- 10:55 AM** Biogeochemically Enhanced Treatment of Chlorinated Organics and Metals
Primrose A *D. Leigh, A. Seech, and J. Molin*
Daniel Leigh (Evonik/USA)

Session – A3. ZVI: 25 Years of Groundwater Remediation Applications

- 1:00 PM** Long-Term Performance Update on the 17-Year Anniversary of the First Full-Scale
Primrose A EHC[®] Injection PRB
J. Molin, A. Seech, J. Valkenburg, R. Oesterreich, and J. Son
Josephine Molin (Evonik/USA)

Wednesday, May 25, 2022

Session – A4. Combined Remedies and Treatment Trains

- 1:25 PM** Excavation, Groundwater Extraction, In Situ Bioremediation, and In Situ Chemical
Primrose A Oxidation to Treat Large Commingled cVOC Plumes
R.E. Mayer, J. Koelsch, K. Chambers, and M. Gunderson
Robert Mayer (APTIM Federal Services/USA)
- 3:30 PM** Optimized Reagent Blends for a Combined ISCO-ISS Remedy
Primrose A *B.A. Smith and B. Desjardins*
Brant Smith (Evonik/USA)

Session – B4. In Situ Chemical Oxidation: Optimized

8:00 AM Optimizing Activated Persulfate Application to Address Density Effects and Geological Inhomogeneities at the Kaergaard Plantation Megasite
Primrose B
L.F. Bennedsen, M. Christophersen, T.H. Jørgensen, L. Nissen, L. MacKinnon, F. Solano, N.D. Durant, J.F. Christensen, I.H. Olesen, and L. Lévy.
Lars Bennedsen (Ramboll/Denmark)

8:25 AM Achievement of Regulatory Closure at a VOC-Impacted Site Using Soil Mixing with Sodium Persulfate
Primrose B
M. Perlmutter and E. Filc
Emil Flic (Jacobs/USA)

8:50 AM Lessons Learned from Multiple Technology Evaluation to Treat Residual Contamination at a Former MGP Site
Primrose B
J. Bergman, H. Nord, P. Elander, S. Moeini, J. Molin, and B. Smith
Jonny Bergman (RGS Nordic/Sweden)

10:05 AM In Situ Chemical Oxidation Bench-Scale Column Testing Using Base-Activated Potassium Persulfate
Primrose B
S. Dworatzek, J. Roberts, and K. Ashworth. Sandra Dworatzek
Sandra Dworatzek (SiREM/Canada)

10:30 AM ISCO Using Sequential Activation Methods for Sodium Persulfate for Treatment of PCP and DRO
Primrose B
A.A. Rees, D.C. Phelps, P.M. Dombrowski, P. Karla, and M. Temple
Assaf Rees (AECOM/USA)

Session – D5. DNAPL Source Zone Remediation: Lessons Learned

10:30 AM Sequenced S-ISCO, ISCO and Bioremediation for Treatment of a Pharmaceutical Waste Mixture: Full-Scale Application
Primrose D
T.H. Jørgensen, L. Nissen, L. MacKinnon, F. Solano, N.D. Durant, L.R. Bennedsen, M. Christophersen, J.F. Christensen, and I. Holm Olesen
Torben Højbjerg Jørgensen (COWI AS/Denmark)

Session – D9. Chromium Remediation

3:05 PM In Situ Groundwater Treatment to Address Electroplating Facility Waste Discharging to the Surface
Primrose D
D. Beck, L. Kozel, A. Cuellar, and P. McCall
David Beck (Tetra Tech/USA)

Session – G5. In Situ Remediation of Petroleum Hydrocarbons

8:00 AM Long-Term Anaerobic Bioremediation of MGP Contaminants by Iron- and Sulfate-Reducing Bacteria following Combined ISCO/ISS Treatment
Pasadena
D.P. Cassidy and V.J. Srivastava
Daniel Cassidy (Western Michigan University/USA)

8:50 AM Use of Surfactants and Surfactant-Enhanced In Situ Chemical Oxidation (S-ISCO) for NAPL Remediation at the Kaergaard Plantation Megasite
Pasadena
L. MacKinnon, F. Solano, N.D. Durant, L.R. Bennedsen, M. Christophersen T.H. Jørgensen, B. Germundsson, J. Muff, J.F. Christensen, and I. Holm Olesen
Filipe Solano (Geosyntec Consultants/Canada)

Group 1 Posters

Display: Sunday 6:00 PM – Tuesday 1:00 PM

Presentations: Monday 4:30 PM – 6:30 PM

Session – A1. Emerging Remediation Technologies

- Poster # 10** Integrating Multi-Technology Surfactant-Enhanced Bioremediation and Oxidation Approaches for Petroleum Hydrocarbon Remediation
D. Socci and G. Dahal.
Dan Socci (EthicalChem/USA)

Session – A2. Abiotic and In Situ Biogeochemical Processes: Applications and Lessons Learned

- Poster # 16** Limited Bedrock Injection Volume Nets Substantial Concentration Reductions
H. Kilts, D. Good, S. Grillo, and F. Lakhwala.
Heather Kilts (Groundwater & Environmental Services, Inc./USA)
- Poster #18** Full-Scale Application in Italy of a Combined ISCR and ERD Technology for the Treatment of an Aerobic Aquifer Impacted with Tetrachloromethane and Chloroform
Leombruni, M. Mueller, F. Lakhwala, and D. Leigh
Alberto Leombruni (Evonik/Italy)
- Poster # 21** Can Less Remediation Be More Effective? Combining Targeted Soil Excavation with Passively Dispersed Reductive Amendment in a Source Area over Fractured Bedrock
R.S. Powell
R. Scott Powell (EnviroForensics, LLC/USA)

Session – A3. ZVI: 25 Years of Groundwater Remediation Applications

- Poster # 32** Treating Chlorinated Pesticides and Organic Explosive Compounds in Soil with ZVI/Organic Carbon Reagents: 25 Years of Lessons Learned
A.G. Seech. J. Valkenburg
John Valkenburg (Evonik/USA)

Session – A4. Combined Remedies and Treatment Trains

- Poster # 34** Combined Remediation of VOCs, 1,4-Dioxane, and Cr(VI) Using ISCO followed by ERD
W. Bell, J. Neuhaus, C. Lenker, and V. Ramalingam
Walter Bell (Tetra Tech/USA)
- Poster # 35** Combined Remedies Evaluation to Treat Residual Contamination at a Former MGP Site
J. Bergman, H. Nord, P. Elander, S. Moeini, J. Molin, and B. Smith
Jonny Bergman (RGS Nordic/Sweden)

Poster # 40 In Situ Chemical Oxidation followed by Enhanced Reductive Dechlorination for Treatment of Chlorinated Solvents in Groundwater
S. Dore, D. Cusick, D. Pope, R. Thomas, and J. Wasielewski
Sophia Dore (GHD/USA)

Poster # 55 Evaluation and Implementation of ISS-ISCO at a Dry Cleaner Site
J.W. Parker and W. Lang
Doug Spencer (Hamp, Mathews and Associates/USA)

Session – B1. In Situ Technologies: Lessons Learned

Poster # 67 Lessons Learned: Using Geochemical Data to Better Assess Performance following Field Applications
J. Molin and B. Smith
Josephine Molin (Evonik/USA)

Poster # 68 Evaluating the Effect of Salinity on In Situ Biological Reduction of a 1,2-DCA Plume
I. Pelz, A. Chemburkar, A. Breckenridge, J. Kerl, and D. Leigh
Isaac Pelz (ERM/USA)

Session – B4. In Situ Chemical Oxidation: Optimized Design Approaches and Lessons Learned

Poster # 82 Lessons Learned from Injecting More than 100 Tons of Potassium Persulfate
A.M. Baird, D.E. Knight, and J. Lowe
Drew Baird (FRx, Inc./USA)

Poster # 83 Soil Blending of Chemical Oxidants Accelerates Site Closure
D. Cline, R. Lamphier, P. Hicks, and B. Smith
Donna Cline (Terracon Consultants Inc./USA)

Poster # 90 ISCO of Really-High-Concentrations of MTBE and TBA in Groundwater Using Activated Persulfate
A.A. Rees, M. Ben-Tzour, J.M. Duffey, and B. Bulkin
Assaf Rees (AECOM/USA)

Poster # 91 Large-Scale Plume, Nano-Scale Solution: Remediation of CVOC Using Sodium Persulfate and Oxone Nanobubbles
G.N. Garcia, A.R. Cervelin, F.A. Campello, G. Van den Daele, G.D.C. de Mello, S.S. Steiner, and M. Barbara
Matheus Roldan (Ramboll Brasil/Brazil)

Poster # 92 Maximizing Effectiveness and Longevity of Activated Persulfate Oxidation Soil Mixing for the Remediation of Petroleum Hydrocarbons
L. Zeng, M. Wenrick, A. Boodram, S. Abrams, M. Spievack, S. Sherman, and V. Yarina
Matthew Wenrick (Langan/USA)

Session – B5. Injectable Activated Carbon Amendments: Lessons Learned and Best Practices

- Poster # 97** Application in Italy of EHC® Plus Technology: Rapid Contaminant Reduction and Accelerated Bioremediation Using an Injectable Reagent Containing Activated Carbon
A. Leombruni, M. Mueller, and F. Lakhwala
Alberto Leombruni (Evonik/Italy)

Session – B6. Innovations in ZVI Amendment Formulations and Applications

- Poster # 109** Using Rapid Investigation Tools to Select and Implement an In Situ Remediation Approach for Carbon Tetrachloride
R.B. Shah, J.D. Liebig, and F. Lakhwala
John Liebig (Consultech Environmental, LLC/USA)

- Poster # 110** Novel Composite Materials for the In Situ Remediation of Aged Chlorinated Contaminant Plumes
J. Bosch, S. Sühnhholz, A. Fischer, K. Kuntze, M. Mueller, A. Georgi, and K. Mackenzie
Julian Bosch (Intrapore GmbH/Germany)

Session – C1. Remedial Design Optimization

- Poster # 120** Enhanced Monitored Natural Attenuation to Reduce Contaminant Flux to a Tidal Estuary
J. Nemesh
Joseph Nemesh (Tetra Tech/USA)

Session – D3. Adaptive Site Management

- Poster # 188** Use of Pilot Data and Adaptive Project Management to Design and Implement a Large, Full-Scale EISB/ISCR Remedy
M.R. Harkness, P. Freyer, L. Reusser, D. Carnevale, P. Hare, and L. Scheuing
Mark Harkness (Ramboll/USA)

Session – D5. Adaptive Site Management

- Poster # 209** Decade-Long Monitoring of Enhanced Dechlorination of TCE Present in Groundwater and MGP Waste DNAPL
C. Savoie, E. Bakkom, P. Wiescher, and M. Murray
Courtney Savoie (Maul Foster & Alongi, Inc./USA)

Session – I3. 1,4-Dioxane Remediation Challenges

- Poster # 376** Selecting the Most Viable Oxidant to Treat 1,4-Dioxane in Groundwater
K. Ramanand, R. Ruhmke, K.D. Dyson, and J. Seracuse
Karnam Ramanand (Brown and Caldwell/USA)
- Poster # 377** Treating 1,4-Dioxane in Commingled Plumes with ISCO
B.A. Smith and B. Desjardins
Brant Smith (Evonik/USA)

Group 2 Posters

Display: Wednesday 7:00 AM – Thursday 1:00 PM

Presentations: Wednesday 4:30 PM – 6:30 PM

Session – A7: Horizontal Wells: Applications and Lessons Learned in Site Characterization and Remediation

- Poster # 26** Delivering the Goods: How Horizontal Wells Delivered ISCO Success under Challenging Conditions
M. Pena, C. Spooner, J. Wright, and M.W. Killingstad
Maria Pena (Arcadis/USA)

Session – B7. Innovative and Optimized Amendment Delivery and Monitoring Methods

- Poster # 45** Limitations and Lessons Learned in Adjusting ORP and Extreme pH for ISCR-Driven Groundwater Remediation of VOCs and Metals
T.J. Patterson and R. Srirangam
Thomas Patterson (Roux Associates, Inc./USA)

- Poster # 52** The Devil Is in the Details: Practical Considerations for Successful Horizontal Injection Well Design
J. Wright, M. Killingstad, C. Spooner, and M. Pena
Jesse Wright (Arcadis/USA)

Session – C9. GSR Best Practices and Nature-Based Remediation Case Studies

- Poster # 100** Adaptive Utilization of Natural Site Conditions to Facilitate Effective Remediation: Be Like Water
T.J. Patterson
Thomas Patterson (Roux Associates, Inc./USA)

Session – D7. Precipitation and Stabilization of Metals

- Poster # 125** Biogeochemical Stabilization of Divalent Metals: A Comprehensive Multi-Phase Treatability Study
R. Srirangam, A. Seech, L. Hellerich, N. Hastings, and Z. Smith
Ravikumar Srirangam (Evonik/USA)

Session – G5. In Situ Remediation of Petroleum Hydrocarbons

Poster # 225 Application of an All-in-One ISCO Technology for the Treatment of Hydrocarbons, BTEX and MTBE at a Former Retail Petrol Station in Italy

A. Leombruni, M. Mueller, and B. Smith

Alberto Leombruni (Evonik/Italy)

Session – G11. International Remedy Applications: Regulatory and Logistical Challenges of Remediation Abroad

Poster # 266 Sodium Persulfate with Integrated Activator Destroys >99% of Trichlorethylene in 5 Weeks at a Manufacturing Facility in Holland

M. Mueller and H. Opdam

Mike Mueller (Evonik/Austria)

Session – I9. Remediation Approaches in Fractured Rock and Karst Aquifers

Poster # 355 Optimizing Remediation in Bedrock: Lessons from Successful Remediation at Two Sites following Past Failures

P.M. Dombrowski, T. Musser, P. Kakarla, M. Temple, C. Weeden, M. Colon, and D. Bytautas

Paul M. Dombrowski (ISOTEC Remediation Technologies/USA)

