May 14, 2003

FY2003 EMSP PRINCIPAL INVESTIGATOR WORKSHOP
May 6-7, 2003

WR Wiley Environmental Molecular Sciences Laboratory
Pacific Northwest National Laboratory, Richland, WA

TUESDAY, MAY 6

7:15 Registration – ***EMSL Lobby***

INTRODUCTION (All Principle Investigators) **– *Battelle Auditorium***

8:00 Commence Workshop (John Morse, DOE-RL; John Zachara, PNNL)

8:15 EMSP Program (Teresa Fryberger, DOE-HQ)

8:45 Regulatory Perspective (Dennis Faulk, U.S. EPA; Dib Goswami, WA - DOE)

Status and S&T Needs

9:00 High-Level Waste (Ken Gasper, CH2M Hill)

9:30 Tank Farm Vadose Zone Characterization and Corrective Actions (Tony Knepp and Frank Anderson, CH2M Hill)

10:00 Groundwater Protection Program (Tom Fogwell, Fluor Hanford)

10:30 *BREAK*

I. SUBSURFACE SCIENCE
(John Zachara to chair)
EMSL Auditorium

Environmental Chemistry/Geochemistry
(Andy Felmy to preside)

10:40 Project 86729, Robert Riley, "Mechanisms of CCl_4 Retention and Slow Release in Model Porous Solids and Sediments"

11:00 Project 86845, Paul Bertsch, "Linking Chemical Speciations, Desorption Kinetics, and Bioavailability of U and Ni in Age-Contaminated Sediments: A Scientific Basis for Natural Attenuation and Risk Assessment"

11:20 Project 86898, Kathryn Nagy, "Reactivity of Primary Soil Minerals and Secondary Precipitates Beneath Leaking Hanford Waste Tanks"

II. HIGH-LEVEL WASTE
(Gary Josephson to chair)
EMSL 1075/1077

Immobilization/Wasteforms
(Denis Strachan to preside)

10:45 Project 81897, Paul Woskov, "Millimeter-Wave Measurements of High Level and Low Activity Glass Melts"

11:15 Project 81934, Theodore Besmann (John Vienna to present), "Stability of High Level Radioactive Waste Forms"

11:45 Project 81926, Sheng Dai, "Chemistry of Actinides in Molten Glasses and It's Correlation to Structural Performance of Solid Glasses: Filling the Knowledge Gap"

11:40	Project 86984, Jonathan Chorover (Karl Mueller to present), "Caustic Waste-Soil Weathering Reactions and Their Impacts on Trace Contaminant Migration and Sequestration"	Project 81927, Sheng Dai, "A New Method for In-Situ Characterization of Important Actinides and Technetium Compounds via Fiberoptic Surface Enhanced Raman Spectroscopy (SERS)"
12:00	*LUNCH*	12:15 *LUNCH*
		Closure (Denis Strachan to preside)
1:00	Project 86753, Andy Felmy, "The Aqueous Thermodynamics and Complexation Reactions of Anionic Silica and Uranium Species to High Concentration"	1:00 Project 81887, Shas Mattigod, "Precipitation and Desorption of Aluminum-Containing Phases on Tank Wastes" Project 81893, Peter McGrail (Shas Mattigod to present), "Physicochemical Processes Controlling Source Term from Tank Residuals"
1:40	Project 73775, Jiamin Wan, "Colloid Genesis/Transport and Flow Pathway Alterations Resulting from Interactions of Highly Reactive Waste Solutions and Sediments in the Hanford Vadose Zone"	1:30 Project 81940, Kenneth Nash, "Characterization of Actinides in Simulated Alkaline Tank Waste Sludges and Leach Solutions"
	Transport and Scaling (Andy Ward to preside)	
2:00	Project 86870, Timothy Long, "Differential Group-Velocity Detection of Fluid Paths"	2:00 Project 81988, Norman Schroeder, "Identification of Non-Pertechnetate Species in Hanford Tank Waste, their Synthesis, Characterization, and Fundamental Chemistry"
2:20	Project 86977, Paul Meakin, "Multiphase Flow in Complex Fracture Apertures Under a Wide Range of Flow Conditions"	
2:40	Project 87003, Michael Nicholl, "Advanced conceptual Models for Unsaturated and Two-Phase Flow in Fractured Rock"	2:30 Project 81921, Nancy Hess, "Technetium Chemistry in HLW: Role of Organic Complexants"
3:00	*BREAK*	3:00 *BREAK*
3:15	Project 86952, Anderson Ward, "Multi-Regional Reactive Transport Due to Strong Anisotropy in Unsaturated Soils with Evolving Scales of Heterogeneity"	3:15 Project 81883, Donald Camaioni, "Mechanisms and Kinetics of Organic Aging and Characterization of Intermediates in High-Level Waste"

3:35 Project 86989, Stephen Brown, "Heterogeneity and Scaling in Geologic Media: Applications to Transport in the Vadose and Saturated Zones"

3:55 Project 86679, Robert Roback, "Field-Scale In Situ Measurements of Vadose Zone Flow and Transport Using Multiple Tracers at INEEL Vadose Zone Research Park (VZRP)"

Coupled Processes
(Susan Hubbard to preside)

4:15 Project 86911, Phil Jardine (Melanie Mayes to present), "Coupled Geochemical and Hydrological Processes Governing the Fate and Transport of Radionuclides and Toxic Metals Beneath the Hanford Tank Farms"

4:35 Project 86922, Susan Hubbard, "Characterization of Coupled Hydrologic-Biogeochemical Processes Using Geophysical Data"

4:55 *ADJOURN FOR THE DAY*

Waste Feed Delivery
(Phil Gauglitz to preside)

3:45 Project 81898, Eric Steffler, "Increasing Safety and Reducing Environmental Damage Risk from Aging High-Level Radioactive Waste Tanks"

4:15 Project 81989, Scott Lillard, "The Influence of Radiation on Pit Solution Chemistry as it Pertains to the Transition from Metastable to Stable Pitting in Steels"

4:45 Project 81866, Digby MacDonald, "Development of Advanced Electrochemical Emission Spectroscopy for Monitoring Corrosion in Simulated DOE Liquid Wastes"

5:15 *ADJOURN FOR THE DAY*

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WEDNESDAY, MAY 7

I. SUBSURFACE SCIENCE
(John Zachara to preside)
EMSL Auditorium

8:00 Project 86598, Carl Palmer, "Coupled Flow and Reactivity in the Variably Saturated Porous Media"

8:20 Project 86803, Kay Adler Flitton, "Underground Corrosion After 32 Years: A Study of Fate and Transport"

8:40 Project 86814, Markus Flury, "Colloid-Facilitated Transport of Radionuclides Through the Vadose Zone"

9:00 Project 86900, Jim Saiers, "Influences of Flow Transients and Porous Medium Heterogeneity on Colloid-Associated Contaminants Transport in the Vadose Zone"

Remediation
(Tom Fogwell to preside)

9:20 Project 86687, Christy Ruggiero, "Phytosiderophore Effects on Subsurface Actinide Contaminants: Potential for Phytostabalization and Phytoextraction"

9:40 Project 87016, Bob Smith, "Trace Metals in Groundwater and Vadose Zone Calcite: In Situ Contaminant and Stabilization of ^{90}Strontium and Other Divalent Metals and Radionuclides at Arid West DOE"

10:00 *BREAK*

10:15 Project 86740, Jonathan Icenhower, "Phosphate Barriers for Immobilization of Uranium Plumes"

10:35 Project 86642, Frank Schwartz, "Semi-Passive Chemical Oxidation Schemes for the Long-Term Treatment of Contaminants"

II. HIGH-LEVEL WASTE
(Gary Josephson to preside)
EMSL 1075/1077

Waste and Supplemental Processing
(Phil Gauglitz to preside)

8:00 Project 81891, Robin Rogers, "A New Class of Solvents for TRU Dissolution and Separation: Ionic Liquids"

8:30 Project 81895, Scott Herbst, "Fundamental Chemistry of the Universal Extractant (UNEX) for the Simultaneous Separation of Fission and Products and Transurancies from High-Level Waste Streams"

9:00 Project 81936, Laetitia Delmau, "Combined Extraction of Cesium, Strontium, and Actinide from Alkaline Media: An Extension of the Caustic-Side Solvent Extraction (CSSX) Process Technology"

9:30 Project 81935, Bruce Moyer, "Ion Recognition Approach to Volume Reduction of Alkaline Tank Waste by Separation of Sodium Salts"

10:00 Project 81949, David Hobbs, "Strategic Design and Optimization of Inorganic Sorbents for Cesium, Strontium, and Actinides"

10:30 *BREAK*

10:55 Project 86820, Paul Tratnyek, "Overcoming Barriers to the Remediation of Carbon Tetrachloride Through Manipulation of Competing Reaction Mechanisms"

11:15 Project 86981, George Redden, "Transport, Targeting, and Application of Functional Nanoparticles for Degradation of Chlorinated Organic Solvents"

11:35 Project 86736, Jay Grate (Jungbae Kim to present), "Armored Enzyme Nanoparticles for Remediation of Subsurface Contaminants"

12:00 *LUNCH*

1:00 Project 86800, William Arnold, "Reactive Membrane Barriers for Contaminant of Subsurface Contamination"

1:20 Project 86807, William Apel, "Long-Term Stewardship of Mixed Wastes: Passive Reactive Barriers for Simultaneous In Situ Remediation of Chlorinated Solvent, Heavy Metal, and Radionuclide Contaminants"

Characterization, Analysis, and Monitoring (John Zachara to preside)

1:40 Project 86680, Yixiang Duan, "Ultra-Sensitive Elemental and Isotope Measurements with Compact Plasma Source Cavity Ring-Down Spectroscopy (CPS-CRDS)"

2:00 Project 86912, Michael Ramsey (J.P. Alarie to present), "Nanofluidic Structures for Electrokinetic-Based Hydraulic Pumps"

10:45 Project 81896, Dhanpat Rai, "Speciation, Dissolution, and Redox Reactions of Chromium Relevant to Pretreatment and Separation of High-Level Tank Wastes"

1:15 Project 81912, Timothy Hubler, "Electroactive Materials for Anion Separation – Technetium from Nitrate"

1:45 Project 81867, Darsh Wasan, "Foaming and Antifoaming in Radioactive Waste Pretreatment and Immobilization Processes"

12:15 *LUNCH*

Analytical Tools for Waste and Supplemental Processing (John Hartman to preside)

1:00 Project 81924, Gilbert Brown, "Optical and Microcantilever-Based Sensors for Real-Time In Situ Characterization of High-Level Waste"

1:30 Project 81939, Panos Datskos, "Hybrid Micro-Electro-Mechanical Systems (MEMS) for High Reliable and Selective Characterization of Tank Waste"

2:00 Project 81923, Oleg Egorov, "Radioanalytical Chemistry for Automated Nuclear Waste Process Monitoring"

2:20	Project 86805, Frederick Colwell, "Coupling of Realistic Rate Estimates with Genomics for Assessing Contaminant Attenuation and Long-Term Plume Contaminants"	2:30	Project 81967, George Harvilla, "Radiochemical Analysis by High Sensitivity Dual-Optic Micro X-ray Fluorescence"
2:40	Project 86992, David Wright, "Improving Ground Penetration Radar Imaging in High Loss Environments by Coordinated System Development, Data Processing, Numerical Modeling, and Visualization Methods with Applications to Site Characterizations"		
3:00	*BREAK*	3:00	*BREAK*
			Analytical Tools for Retrieval and Slurry Processing (John Hartman to preside)
3:15	Project 88615, Lee Slater, "Investigating the Potential for Long-Term Permeable Reactive Barrier (PRB) Monitoring from the Electrical Signatures Associated with Reduction in Reactive Iron Performance"	3:15	Project 81964, Lloyd Burgess and Paul Panetta, "Physical Characterization of Solid-Liquid Slurries at High Weight Fractions Utilizing Optical and Ultrasonic Methods"
3:35	Project 86759, Jay Grate, (Oleg Egorov to present), "Radionuclide Sensors for Water Monitoring"	3:45	Project 81889, Margaret Greenwood, "Investigating Ultrasonic Diffraction Grating Spectroscopy and Reflection Techniques for Characterizing Slurry Properties"
3:55	Project 87023, Barbara Minsker, "A New Framework for Adaptive Sampling and Analysis During Long-Term Monitoring and Remedial Action Management"		
4:15	**Concluding Discussions and Issues for Subsurface Science** *(Sample opportunities, collaboration targets, and working groups)*	4:15	**Concluding Discussions and Issues for High-Level Waste** *(Sample opportunities, collaboration targets, and working groups)*
5:00	*ADJOURN* - **Closing Remarks For All Participants** ***EMSL Auditorium***		