



PRELIMINARY CONFERENCE PROGRAM

**The 1st IASTED International Conference on
Unconventional Oils (ENV 2011)
&
The 3rd IASTED International Conference on
Environmental Management and Engineering (EME 2011)
July 4-6, 2011
Calgary, AB, Canada**

LOCATION

Hyatt Regency Hotel
700 Centre Street SE
Calgary, AB T2G 5P6
Canada

UNCONVENTIONAL OILS (ENV 2011)

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The Oil Sands Developers Group (OSDG)

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Chris Powter – Oil Sands Research and Information
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INVITED SPEAKERS

Dr. Marian Weber - Alberta Innovates Technology Futures,
Canada

Satya Brata Das - Cambridge Strategies Inc., Canada

Prof. Tim Joseph - University of Alberta, Canada

Dr. Preston McEachern - Alberta Environment - Oil Sands
Environmental Management Division, Canada

Dr. John Zhou - Alberta Innovates Energy and Environment
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Prof. Pedro Pereira-Almao - University of Calgary, Canada

Don Thompson - The Oil Sands Developers Group, Canada

Mr. Neil Edmunds - Laricina Energy Ltd., Canada

Prof. John Chen - University of Calgary, Canada

PANEL SESSION

Dr. David Wood - University of Calgary, Canada

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 A. Ulrich – University of Alberta, Canada
 C. Wernerheim – Memorial University of Newfoundland, Canada
 T. Yang – University of Regina, Canada

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ENVIRONMENTAL MANAGEMENT AND ENGINEERING (EME 2011)

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Prof. Zhi Feng Yang – Beijing Normal University, PR China

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 Y. Xu – North-China Electric Power University, China

PLEASE NOTE

- ❖ Paper presentations are 15 minutes in length with an additional 5 minutes for questions.
- ❖ Report to your Session Chair 15 minutes before the session is scheduled to begin.
- ❖ Presentations should be loaded onto the presentation laptop in the appropriate room prior to your session.
- ❖ End times of sessions vary depending on the number of papers scheduled.

PROGRAM OVERVIEW

Monday, July 4, 2011

- 07:00 – Registration
(Grand Foyer)
- 08:15– Welcome Address
08:40 (Stephen AB Room)
- 08:40 – ENV Invited Speaker – “Oil Sands Mining
09:20 Equipment Challenges” – Prof. Tim Joseph
(Stephen AB Room)
- 09:20 – ENV Session 1 – Oil Sands Tailings & Tailings
Water Treatment/ Management
(Stephen AB Room)
- 10:00 – Coffee Break
10:30 (TBA)
- 10:30 – ENV Session 1 Continued
(Stephen AB Room)
- 12:00 – Lunch Break
(Hyatt Regency)
- 13:00 – ENV Invited Speaker – “Challenges in
14:00 Numerical Simulation of Heavy Oil/ Oil Sands
Reservoirs” – Prof. John Chen
(Stephen AB Room)
- 14:00 – ENV/EME Invited Speaker – “How Alberta’s Oil
14:40 Sands Can Build a Green Future” –
Satya Brata Das
(Stephen AB Room)
- 15:00 – Coffee Break
15:30 (TBA)
- 15:30 – ENV/EME Invited Speaker – “Technology
16:10 Innovation for Greening Oil Sands Production” –
Dr. John Zhou
(Stephen AB Room)
- 16:10 – EME Session 1 – Environmental Impacts on Soil
(Stephen AB Room)

Tuesday, July 5, 2011

- 08:30 – ENV/EME Panel Session – “Clean Energy
09:30 Development in Alberta” – Dr. David Wood,
Dr. Maen Husein, Mr. Roger Ramcharita and
Asst. Prof. Joule A. Bergerso
(Stephen AB Room)
- 09:30 – Coffee Break
10:00 (TBA)
- 10:00 – ENV/EME Invited Speaker – “Oil Sands: Canada’s
10:40 Energy Advantage” – Don Thompson
(Stephen AB Room)
- 10:40 – ENV Invited Speaker – “The In Situ Technology
11:20 Horizon” – Mr. Neil Edmunds
(Stephen AB Room)
- 11:20 – Lunch Break
(Self-Catered)
- 13:00 – MS Keynote Speaker – “Recent Advantages in
14:00 Modeling and Simulations with Application to
Automotive Systems” – Prof. Nabil Chalhoub
(Stephen AB Room)
- 14:00 – ENV/EME Invited Speaker – “In Reservoir
15:00 Upgrading of Bitumen and Heavy Oils” –
Prof. Pedro Pereira- Almas
(Stephen AB Room)
- 15:00 – Coffee Break
15:30 (TBA)
- 15:30 – ENV Session 2 – Unconventional Oil & the
Environment
(Stephen AB Room)
- 19:00 – Dinner Banquet
(Imperial 1/2/3)

Wednesday, July 6, 2011

- 08:30 – EME/ENV Keynote Speaker – “Sustaining
09:30 Environmental Flows in Regulated Rivers” –
Prof. Zhi Feng Yang
(*Stephen AB Room*)
- 09:30 – Coffee Break
10:00 (*TBA*)
- 10:00 – ENV/EME Invited Speaker – “Water quality and
11:00 quantity in the oil sands: The goals, regulatory
response and the conundrum of remaining flexible”
– Dr. Preston McEachern
(*Stephen AB Room*)
- 11:00 – ENV/EME Invited Speaker – “Emerging
11:40 Opportunities for Conservation Markets in the
Western Canadian Sedimentary Basin” –
Dr. Marian Weber
(*Stephen AB Room*)
- 11:40 – Lunch Break
(*Self-Catered*)
- 12:20 – EME Session 2 – Water Management
(*Stephen AB Room*)
- 14:00 – EME Session 3 – Air Quality, Waste Management
and Sustainable Business
(*Herald Room*)
- 15:00 – Coffee Break
15:30 (*TBA*)
- 15:30 - EME Session 3 Continued
(*Herald Room*)
- 15:30 – ENV Session 3 – Oil Sands Tailings Water
Treatment
(*Stephen AB Room*)

Monday, July 4, 2011

07:00 – REGISTRATION

Location: Grand Foyer

08:15 – 08:40 WELCOME ADDRESS

Location: Stephen AB Room

08:40 – 09:20 ENV INVITED SPEAKER – “OIL SANDS MINING EQUIPMENT CHALLENGES”

Presenter: Prof. Tim Joseph (Canada)

Location: Stephen AB Room

The Athabasca oil sands surface mining deposits of Northern Alberta provide some of the most challenging surface mining operational issues anywhere on Earth. The major mining operators in the region, and the original equipment manufacturers (OEMs) they turn to for tools, have expressed that if the excavation and haulage units they use can survive this environment, they will survive any adverse environment on the planet. There is therefore an incentive for both parties to find solutions to overcome the problems they jointly face.

From deep rutting and ground undulations, high rolling resistance, poor fuel burn and high emissions, to poor tire life, to inadequate suspension response and payload recognition, to structural fatigue, to back injuring whole body vibration at the operator; mining trucks alone face a never ending list of issues. There is much that the commercial and academic research community can do to assist both operators and OEMs, but as one might expect, such solutions do take time. Fortunately it seems that there is also some low hanging fruit that will provide alleviation of much of the problems at hand while a more permanent solution is sought.

This presentation will provide some insight into concerns with suggested self-help solutions for mine operators. Dr. Joseph will specifically discuss mining trucks and shovels with highlights on dipper and body design, benefits of load balance, reducing ground engaging tool maintenance, reducing running surface deterioration, extending tire life, improving suspension performance, extending structural life, achieving accurate payload recognition, reducing fuel usage and emissions and achieving low whole body vibration impact, reducing back injury for truck operators.

The presentation will conclude by illustrating that a substantial reduction in maintenance and operating costs is achievable, while fostering a safer sustainable operating environment.

With degrees from the Universities of Kent (U.K.) and Alberta, **Dr. Tim Joseph**, P.Eng., FCIM is Associate Professor Mining Engineering and Director of the Alberta Equipment – Ground Interactions Syndicate (AEGIS) mining equipment research group in the School of Mining Engineering at the University of Alberta, that supports the research work of a dozen Ph.D. and M.Sc. students and the surface mining and equipment studies of over 160 undergraduate students. Dr. Joseph's research concentrates on safe environmental performance of surface mining equipment operating in the Canadian oil sands, focusing on issues around operator health, emissions, tires, tracks and large mobile structures in relation to adverse operating conditions. Recent work into payload balance and more effective ground engaging tools permitting a lower energy expended per ton excavated, has established Dr. Joseph as a unique innovator. He directly supports the mining industry, mine equipment original equipment manufacturers and their service providers with mine equipment performance evaluations and professional development short courses. His short courses on proactive equipment performance evaluations and equipment maintenance management strategies have been delivered worldwide to hundreds of professionals. A member of APEGGA, ACR, CIM, SME, SMART and other professional and community organizations, Dr. Joseph has served on and chaired multiple committees and guiding groups who have recognized his contributions with several awards and honors; including in 2011 the CIM Distinguished Service Medal. An avid proponent of education and the resource industry; he continues to promote the mining industry through open forums for grade school students to adults in the workplace. Dr. Joseph is also a Vice-President of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) and the General co-Chair of the CIM Edmonton 2012 International Conference & Exhibition.

09:20 – ENV SESSION 1 – OIL SANDS TAILINGS & TAILINGS WATER TREATMENT/ MANAGEMENT

Chair: TBA

Location: Stephen AB Room

731-014

Oil-Contaminated Soil Characterization and Remediation, Kuwait: Review

Ahmad A. Al-Naseem and Dana B. Al-Duwaisan (Kuwait)

731-006

Extraction of Heavy Metals by Phosphate and Oxalate from a Contaminated Soil

Saud S. AL-Oud (Saudi Arabia)

731-015

Long-Term Temporal Trends and Influence of Criteria
Pollutants on Regional Air Quality in Fort McKay, Alberta
Warren B. Kindzierski and Md. Aynul Bari (Canada)

731-017

Information Sources for Developing Oil Sands Plans, Policies
and Research
Chris Powter (Canada)

731-027

Methane Emissions from Oil Sand Tailings by Microbial
Metabolism of Hydrocarbons
Tariq Siddique and Julia Foght (Canada)

10:00 – 10:30 COFFEE BREAK

Location: TBA

10:30 – ENV SESSION 1 CONTINUED

Location: Stephen AB Room

12:00 – LUNCH BREAK

Location: Hyatt Regency

13:00 – 14:00 ENV INVITED SPEAKER – “CHALLENGES IN NUMERICAL SIMULATION OF HEAVY OIL/ OIL SAND RESERVOIRS”

Presenter: Prof. John Chen (Canada)

Location: Stephen AB Room

Mathematical models have widely been used to predict, understand, and optimize complex physical processes in modeling and simulation of multiphase fluid flow in petroleum reservoirs. These models are important for understanding the fate and transport of chemical species and heat. With this understanding the models are then applied to the needs of the petroleum industry to design enhanced oil recovery strategies.

While mathematical modeling and computer simulation have been successful in the recovery of conventional (easy) oil, there still exist a lot of challenges in heavy oil/oil sands (uneasy oils) modeling. As conventional oil reserves dwindle and oil prices rise, the recovery of uneasy oils is now the center stage. Enhanced uneasy oils recovery technologies are an intensive research area in the oil industry, and have recently generated a battery of recovery methods, such as cyclic steam stimulation (CSS), steam assisted gravity drainage (SAGD), vapor extraction (VAPEX), hybrid steam-solvent processes, and other emerging recovery processes. This

presentation will give an overview on challenges encountered in modeling and simulation of these recovery processes: insufficient physics/chemistry in current models, multi-scale phenomena, phase behavior, geomechanics, assisted history matching with closed-loop optimization, transport of solvents, four-phase flow, etc. It will also discuss the development of fast and accurate computational algorithms and their matching-up with emerging hardware architecture.

Dr. Zhangxing (John) Chen is a Professor in the Department of Chemical and Petroleum Engineering, currently holds the NSERC/AERI/Foundation CMG Industrial Research Chair in Reservoir Simulation and iCORE Industrial Chair in Reservoir Modeling, and is Director, Schlumberger iCentre for Simulation & Visualization, University of Calgary. His Ph.D. (1991) is from Purdue University, USA. He was a professor and reservoir engineer at Xi'an Jiaotong University, Peking University, University of Minnesota, Texas A&M University, Mobil, and Southern Methodist University (SMU). Dr. Chen held the Gerald J. Ford Professorship at SMU, Dallas, Texas, USA, and was awarded the Chang Jiang Chaired Professorship by the Chinese Ministry of Education. Other significant appointments include Director of the Center for Scientific Computation, SMU, Director of the Center for Advanced Reservoir Modeling and Simulation, Peking University, and President of the Chinese Association of Science and Technology in Texas. He has published 10 books and over 220 research papers, and has given over 230 invited (plenary and keynote) presentations worldwide. His research interest is in Numerical Reservoir Simulation.

14:00 – 14:40 ENV/EME INVITED SPEAKER – “HOW ALBERTA’S OIL SANDS CAN BUILD A GREEN FUTURE”

Presenter: Satya Brata Das (Canada)

Location: Stephen AB Room

Satya Das's book *Green Oil: Clean Energy for the 21st Century* argues that sustainable development of Alberta's oil sands can play a leading role in the transition from today's high-carbon economy to a clean-energy future. As the only democratic petro-state and owners of the world's largest hydrocarbon deposit, Alberta and Albertans play a key role in the energy security of the democratic world. Alberta can lead and fund the evolution of energy alternatives that will enable democracies to break their addiction to hydrocarbons from turbulent and unstable regions of the world.

Satya Brata Das is an eminent opinion leader; a sought-after commentator on air, in print, and on panels and podiums in both of Canada's national languages.

As Founder and Principal Cambridge Strategies Inc., Satya advises at the most senior levels of federal, provincial and municipal governance. His advice includes governance issues; policy design and development; integrated whole-systems analysis covering political, economic social and cultural aspects; strategic planning; and strategic guidance and counsel to leadership in the private and public sectors. Satya brings an expert understanding of the challenges and implications of Alberta's ownership and stewardship of the world's single largest hydrocarbon resource, the Alberta Oil Sands, and their potential for assuring continental energy security.

His community service is devoted to the arts, culture, societal development, human rights and human dignity, diversity, inclusion and pluralism. His books include *Dispatches From a Borderless World*; *The Best Country: Why Canada Will Lead the Future*; *Green Oil: Clean Energy for the 21st Century*. Born in India, Satya was educated at the universities of Alberta and Cambridge. After collecting a shelf full of awards and recognitions over 35 years as a writer, strategist and volunteer, Satya counts his life partner Mita and their two daughters as his most significant achievements.

15:00 – 15:30 COFFEE BREAK

Location: TBA

15:30 – 16:10 ENV/EME INVITED SPEAKER - “TECHNOLOGY INNOVATION FOR GREENING OIL SANDS PRODUCTION”

Presenter: Dr. John Zhou (Canada)

Location: Stephen AB Room

Alberta's oil sands are one of the largest hydrocarbon resources in the world. Technological innovation has been a critical success factor in the development of these resources. In the past five years, the key challenge for the industry has shifted from economic development to sustainable development. Innovation will play an equally critical role in taking on the challenge to minimize environmental impacts and optimize economic benefits. In greening oil sands production, the focus is on three types of technological innovations. The first is efficiency improvement including better use of waste heat and energy/water conservation. The second is remedial technologies, including carbon capture and storage, oil sands tailings management, and land reclamation.

The third is the development of step-change and transformative technologies such as non-aqueous extraction, solvent enhanced SAGD, and electrical heating and electromagnetic aided processes. As the technology arm of Government of Alberta in Energy and Environment, Alberta Innovates Energy and Environment Solutions (AI-EES) is taking an integrated and balanced portfolio approach and is co-investing with industry in technology innovations to achieve the sustainable development of the oil sands.

Dr. Z. (John) Zhou is the Executive Director, Environmental Management at Alberta Innovates – Energy and Environment Solutions (EES). He has 23 years of research, development, and management experience in energy industry and environmental engineering, and holds seven US patents. As a business unit manager at the Alberta Research Council (now part of Alberta Innovates Technology Futures), Dr. Zhou organized and led an industry consortium called MARIOS (Materials and Reliability in Oil Sands). With 30 industry members, MARIOS is now an internationally recognized program for material and reliability in oil sands industry. Dr. Zhou's current responsibility at EES includes carbon capture and storage, oil sands tailing management, energy related water issues, and enhanced ecology. He holds a B.Sc. in Geology from Jilin University and a Ph.D. in Geochemistry from the University of Western Ontario.

16:10 – EME SESSION 1 – ENVIRONMENTAL IMPACTS ON SOIL

Chair: TBA

Location: Stephen AB Room

736-010

Seed Germination and Early Seedling Growth of Safflower as Affected by Heavy Metal Mixture

Alireza Houshmandfar (Iran)

736-011

Assessment of Soil Erosion and Conservation: Application of USLE Model in Southern Ethiopia

Derege T. Meshesha, Atsushi Tsunekawa, Mitsuru Tsubo (Japan), and Nigussie Haregeweyn

736-014

Spatial Distribution of Soil Properties and Heavy Metals Content Around a Cement Factory in Al-Hassa Oasis, Saudi Arabia

Abdulrasoul M. Al-Omran, Salem E. El-Maghraby, Mahmoud E.A. Nadeem, Ali M. El-Eter, and Salem M.I. Al Qahtani (Saudi Arabia)

736-034

Effect of Voltage Gradient on Electrokinetic Remediation of CR (VI) and Phenol Contaminated Soil using EDTA

Mohsen Saeedi and Behnoosh Khataei (Iran)

736-061

Impact of Environmental Factors on Bio-Surfactant Surface Property and its Sorption onto Soils

Wen Zhang, Jianbing Li, Guohe Huang, Wei Li, Ling Wang, and Shanshan Li (PR China)

Tuesday, July 5, 2011

08:30 – 09:30 ENV/EME PANEL SESSION – “CLEAN ENERGY DEVELOPMENT IN ALBERTA”

Presenters: Dr. David Wood, Dr. Maen Husein, Mr. Roger Ramcharita & Assc. Prof. Joule A. Bergerson (Canada)

Location: Stephen AB Room

Alberta has the most greenhouse gas-intensive electricity in Canada despite having the country's best wind and solar resources. The panel will discuss the pathways to a greener future by substantially increasing the generation of renewable electricity and reducing our reliance on coal. It will cover some of the main technological and policy issues that must be addressed.

Several examples of questions or issues that will be addressed by the panel:

- * How green is Alberta's current energy generation?
- * What are the pathways to a greener future?
- * What green generation technologies will be used in 20 years time?
- * What is Alberta's Regulatory and Policy approach to Clean Energy development in the province?
- * What is the role of research and technology partnerships in transitioning to a cleaner energy future?
- * What is the Government of Alberta doing today in encourage Alternative and Renewable energy development?
- * What is Alberta doing to solve the Tailings Pond challenge?
- * What is Alberta's approach to reclamation in the oil sands?

Maen M. Husein is an associate professor at the Department of Chemical and Petroleum Engineering, University of Calgary, Calgary, Alberta. He received his B.Sc. in chemical engineering from Jordan University of Science and Technology (JUST), Irbid, Jordan, in 1995, and his M.Sc. and Ph.D. in chemical engineering from McGill University, Montreal, Quebec, in 1996 and 2000; respectively. He worked as a software engineer in the Power System Group at CAE Inc., Montreal, Quebec, from 2000 to 2002. His tasks included simulating different units of the power generation cycle of a nuclear power plant. Dr. Husein's research interest employs (w/o) microemulsion methods to form nanoparticle catalyst and sorbents for heavy oil upgrading. In addition, Dr. Husein is interested in remediating produced water from organic contaminants to enable effective produced water recycling.

Roger Ramcharita is Director, Clean Energy Policy Branch, with the Environmental Policy Division in Alberta Environment. Roger's 10 year career with the Government of

Alberta includes holding key positions as the Executive Assistant to the Minister of Environment, Regional Environmental Manager, Management of Environmental Assessment Team and as a Wildlife Biologist. He holds a Bachelor of Science and Master of Science in Wildlife Biology from the University of British Columbia.

Dr. Joule A. Bergerson is Assistant Professor, ISEEE Energy and Environmental Systems Group, Centre for Environmental Engineering Research and Education, Department of Chemical and Petroleum Engineering, University of Calgary. Her primary research interests are systems-level analysis for policy and decision making of energy system investment and management. The focus of her work is developing frameworks for the assessment of prospective technology options and their policy implications from a life cycle perspective. To date, her work has addressed fossil fuel derived electricity (PhD Thesis), oil sands development (Project Website) and carbon capture and storage (ecoEnergy CCS Task Force Report). Dr. Bergerson received her Ph.D. in a joint program of Civil and Environmental Engineering and Engineering and Public Policy at Carnegie Mellon University. The title of her dissertation was "Future Electricity Generation: An Economic and Environmental Life Cycle Perspective on Technology Options and Policy Implications" under the direction of Professors Lester Lave and Chris Hendrickson. She has a Masters of Engineering Degree in Chemical Engineering with a collaborative program in Environmental Engineering from the University of Toronto and an undergraduate degree in chemistry and environmental science from the University of Western Ontario. Prior to joining the Ph.D. program at Carnegie Mellon University, she worked as a technical systems analyst and a project manager for R&D projects at the Royal Bank of Canada in the Information Technology division.

David Wood holds Bachelor's and Master's degrees in Mechanical Engineering from Sydney University and a PhD in Aeronautics from Imperial College, London. He taught at Newcastle University in Australia for many years before resigning in 2004 to start Aerogenesis Australia, a small company that develops and builds small wind turbines. He has been at the University of Calgary since February, 2010 and currently holds the NSERC/RNMAX Research Chair in Renewable Energy. He is the author or co-author of over 100 refereed journal and conference publications in renewable energy, four book chapters, and has a book on small wind turbines due to be published by Springer in July.

09:30 – 10:00 COFFEE BREAK

Location: TBA

10:00 – 10:40 ENV/EME INVITED SPEAKER – “OIL SANDS: CANADA’S ENERGY ADVANTAGE”

Presenter: Don Thompson (Canada)

Location: Stephen AB Room

Canada's oil sands are not just a critical source of energy, they are also a key driver of the Canadian economy and standard of living. A recent report from Peters & Co. Predicts \$180 billion in oil sands spending over the next decade. This investment of billions of dollars, and the economic and employment benefits that accompany it will help shape important Canadian business sectors and support economic growth across the country. Join Don Thompson, President of the Oil Sands Developers Group, as he discusses how Canadian cities and provinces benefit from the development of the oil sands and take advantage of the industry's many economic opportunities.

Don Thompson is President of The Oil Sands Developers Group (OSDG). Don, with his Board, determines the group's position on various issues brought forward by members for collaborative consideration, action and resolution.

Don is also the external voice for OSDG, presenting OSDG members' actions and ideas to external audiences across Canada, in the United States and in Europe – industry, community and government. As a result of his outreach program Don has established strong working relationships with business, industry and government leaders within Canada and internationally. Don serves in his capacity with OSDG through the support of Syncrude Canada Ltd. where he has worked since 1979.

On behalf of OSDG, Don has travelled extensively to speak in major cities and smaller communities that contribute to and benefit from oil sands development. Over the past two years he has delivered the oil sands facts to more than 100 audiences and over 300 international media outlets around the globe.

10:40 – 11:20 ENV INVITED SPEAKER – “THE IN SITU TECHNOLOGY HORIZON”

Presenter: Mr. Neil Edmunds (Canada)

Location: Stephen AB Room

Oil sands engineers now speak of bitumen recovery by SAGD in the McMurray Formation as “conventional”, even though

the technology is still evolving. On the horizon, are new technologies and new reservoirs. Of the latter, the Grosmont Formation, containing about 400 billion bbls in highly karsted dolomite, is prominent. There is also renewed attention to the Grand Rapids and Bluesky Formations as thermal targets, and further carbonate plays.

On the technology side, solvent additives to steam have arrived on a commercial basis, and solvent applications are expected to continue to evolve and expand. In situ combustion processes, also in the field testing stage, have their unique challenges but are likely to see commercial application at least as a SAGD follow-up method. Further out, several parties are now investigating possible applications of selective electromagnetic heating of reservoirs.

Finally, there are a number of possible approaches to mild field upgrading which could significantly improve economics by reducing the requirement for transport diluent to meet pipeline specifications. Mild hydrocracking and mechanical shear treatment, are two of the more promising possibilities.

Neil Edmunds is Vice President, EOR for Laricina Energy Ltd. Previously he was a reservoir specialist with AEC/EnCana, responsible for Vapex piloting and SAGD optimization. He has over 30 years of experience in thermal recovery and related software development, participating in the UTF, Senlac, and Foster Creek SAGD projects. Neil is a graduate of the U of A (Mech. Eng.) and is a member of APEGGA, the Canadian Heavy Oil Association, and the Society of Petroleum Engineers. In 2008 he was appointed Adjunct Associate Professor in the Schulich School of Engineering at the University of Calgary.

11:20 – LUNCH BREAK

Self-Catered

13:00 – 14:00 MS KEYNOTE SPEAKER – “RECENT ADVANTAGES IN MODELING AND SIMULATIONS WITH APPLICATION TO AUTOMOTIVE SYSTEMS”

Presenter: Prof. Nabil Chalhoub (USA)

Location: Stephen AB Room

Dr. Nabil G. Chalhoub received his BSME and MSME from the Mechanical Engineering Department at Wayne State University and his Ph.D. from the Mechanical Engineering Department at the University of Michigan, Ann Arbor. He is currently a Professor of Mechanical Engineering at Wayne State University (WSU). His research interest is in

modeling and active control of flexible structures, robotics, solid-fluid interaction, internal combustion (IC) engines cycle simulations, IC engine dynamics and tribology, guidance and control of marine vessels, nonlinear robust controllers and observers, self-tuning fuzzy controllers. He is currently the co-chair for the International Conference on Advanced Research and Applications in Mechanical Engineering (ICARAME'11). He is serving as an Associate Editor for the ASME Journal of Dynamic Systems, Measurement, and Control (JDSMC) and the Journal of Vibration and Control (JVC). He was the Chair of the Model Identification and Intelligent Systems (MIIS) Technical Committee in the ASME Dynamic Systems and Control Division. He has also served on NSF Review Panels for the Dynamic Systems, and Control Division, on the Local Committee for the International Symposium on Vibro-Impact Dynamics of Ocean Systems and Related Problems, and on the International Program Committee for the 2009 IASTED International Conference on Robotics and Applications. He has 60 refereed publications and his research has been funded by NSF, ONR, ARO, U.S. Army TARDEC, Ford Motor Company and Chrysler.

14:00 – 15:00 ENV/EME INVITED SPEAKER – “IN RESERVOIR UPGRADING OF BITUMEN AND HEAVY OILS”

Presenter: Prof. Pedro Pereira-Almao (Canada)

Location: Stephen AB Room

With the deployment of thermal in situ bitumen production technologies based on the use of steam, a different engineering approach compared to conventional oil exploitation has resulted. Steam Assisted Gravity Drainage (SAGD), for example, allows the development of a relatively confined liquid and gas chamber surrounding and along the length of the production wells. This chamber, in virtue of the heat carried there with steam, reaches temperature levels in between 180-250 C. This stationary heated place can be converted into a reactor for in situ upgrading processes, or as an upgrading initiation place integrated to field upgrading technologies which could result in environmentally-economically sound options. Temperature levels in the reservoir zone can be increased beyond steam limitations by at least partially rescinding of it as a heat carrier. Thus, new technologies raising expectations of extensive reservoir upgrading of unconventional oils can be thought of. In-Situ hybrid processes of recovery-upgrading, with delivery of dispersible catalysts and reactants, have the potential to produce upgraded petroleum in situ. These processes would reduce the total energy currently required to both exploit the

reservoir and surface upgrade the produced bitumen. These could also selectively transform contaminants into harmless products remaining in the reservoir.

Unconventional oils such as the ones abundant in Canada and Venezuela require twice the amount of hydrogen to get to refined products than light crude oils. However, it is shown in this paper that the hydrogen per barrel needed to get these oils to transportable viscosities, is almost one order of magnitude lower than what is needed in traditional upgrading setups. This is a strong motivation to develop in situ or field upgrading processes. This talk highlights refocused in situ upgrading paths that may result in much needed economically and environmentally efficient oil sands exploitation methods.

Dr. Pedro R. Pereira-Almao received his PhD in Heterogeneous Catalysis from L'Universite de Poitiers, France in 1979. He became an Associate professor from 1980 until 1987 with the Department of Chemical Engineering at the Universidad de Los Andes, Venezuela and later a visiting professor and postdoctoral fellowship at the University of California Berkeley-Lawrence Berkely National Laboratory where he was the R&D Leader on steam coal gasification, and methane coupling with the group of Gabor Somorjai. He made a substantial contribution at PDVSA-Intevep, Venezuela's national oil company over the course of 14 years, specializing in catalysis for heavy hydrocarbon processing and co-inventing and co-developing two major heavy oil upgrading technologies: Aquaconversion and HDHplus. He was project leader of heavy oils and residuals upgrading at PDVSA-Intevep from 1990 to 1999 and Department manager of heavy oils processing at the same institution from 2000 until 2002. Recruited by the University of Calgary in 2003 as an Alberta Ingenuity Scholar and professor for the Schulich School of Engineering, Dr. Pereira-Almao became Director of the Ingenuity Centre for In Situ Energy and in March 2011 was awarded with the NSERC/NEXEN/Alberta Innovates Energy and Environment Solutions Industrial Research Chair in Catalysis for Bitumen Upgrading. He is the author of more than 80 published articles with more than 20 invited international conferences, and ten original patents.

15:00 – 15:30 COFFEE BREAK

Location: TBA

15:30 – ENV SESSION 2 – UNCONVENTIONAL OIL & THE ENVIRONMENT

Chair: TBA

Location: Stephen AB Room

731-016

Evaluation of Renewable Energy Sources for Steam Assisted Gravity Drainage (SAGD) Operation

Sepideh Kasiri, Ania Ulrich, Vinay Prasad, and Amos Ben-Zvi (Canada)

731-010

Reducing Water Vapour Emissions and Fog Formation at SAGD Facilities

Randy Rudolph, Steven Young, Claes Palmgren, Elizabeth Logan, and Piotr Staniaszek (Canada)

731-022

The Effect of CO₂ Solubility on Supercritical CO₂ Injection into Low Permeable Rocks

Ardy Arsyad, Yasuhiro Mitani, Hiro Ikemi, and Shiro Oura (Japan)

733-002

Use of Combined In Situ CO₂ Generation and Chemical Flooding for Viscous Oil Recovery

733-007

Nanoparticles - Its Significance In Drilling Fluid Development For Enhance Oil Recovery

Jamil A Abdo, Mohammed D Haneef, and Hamed H. Al-Sharji (Oman)

19:00 – DINNER BANQUET

Location: Imperial 1/2/3

Wednesday, July 6, 2011

**08:30 – 09:30 EME/ENV KEYNOTE SPEAKER –
“SUSTAINING ENVIRONMENTAL FLOWS IN
REGULATED RIVERS”**

Presenter: Prof. Zhi Feng Yang (China)

Location: Stephen AB Room

Sustaining environmental flows is necessary for maintaining the health of regulated rivers, and it needs to be balanced with human water provision. The tensions between human and ecological water requirements are intensifying due to global population growth and increasing human demands as well as new 'green' legislation. This paper reviews the advances of methods and technologies related to environmental flow provision. Maintaining natural flow regime and reducing its alteration are key principles for environmental flow management. Methods for assessing the degree of flow regime alteration are evaluated by their effectiveness of reflecting the extent of ecological degradations in rivers. Environmental flow management methods are classified into basic, acceptable and preferred strategies, and they are assessed by their ability to ensure the planned human water supply and maintain the health of river ecosystems. Reasonable environmental flow management methods for rivers depend on the planned amounts of water withdrawal and the protection objectives of the targeted rivers. The reservoir storage capacity, a key design parameter of a reservoir, is also analyzed in terms of their effects on environmental flow and human water provision. At the reservoir design stage, the values of both the minimum required and preferred reservoir storage capacities need to be given to the decision makers for better sustaining environmental flows and ensuring the planned water supply.

Professor Yang Zhifeng is an expert of Environmental Sciences. He is the Dean of the School of Environment, Beijing Normal University and the Director of the State Key Laboratory of Water Environment Simulation. He received his doctoral degree from the Department of Hydraulic Engineering, Tsinghua University in 1989. He has long-term been working in the field of Environmental Sciences and specially expertise in Wetland Ecological Processes, Environmental Flow and Urban Ecological Planning and Management. He is the specially-appointed professor of Chang Jiang Scholars Program. He has won over 10 research awards, such as the National Outstanding Youth Science Fund, the Second Prize of National Science and Technology Progress Award by Ministry of Science and Technology (in 2008) as well as the First Prize of Science and Technology Progress three times (in 2003, 2004 and 2005), which is awarded by Ministry of Education, China. Furthermore, Prof.

Yang has committed to many key research projects. He is the Chief Scientist of the National Basic Research Program of China (973) Program. He served for times as the chief consultant expert and team leader of many crucial research projects. Besides, he is an outstanding and fruitful scholar who published more than 10 books on water resource management, urban planning, ecological engineering, and nearly 500 peer-reviewed papers, among which over 120 have been selected by SCI (Science Citation Index) system and 100 have been cited by EI (Engineering Index) system. Professor Yang is also active in academic societies. He is a Branch Chairman of International Environmental Informatics Association, an editor of Frontiers of Environmental & Engineering in China. He served for times as Chairman or member of Program Committees for many International Academic conferences in the past decade.

09:30 – 10:00 COFFEE BREAK

Location: TBA

**10:00 – 11:00 ENV/EME INVITED SPEAKER –
“WATER QUALITY AND QUANTITY IN THE OIL
SANDS: THE GOALS, REGULATORY RESPONSE
AND THE CONINDRUM OF REMAINING
FLEXIBLE”**

Presenter: Dr. Preston McEachern (Canada)

Location: Stephen AB Room

Recent press and public discourse on oil sands mining have been dominated by negative views on water use, water quality, reclamation and ultimately on sustainability. These interdependent issues are indeed challenges in oil sands management but their solutions are comprehensible, approachable and are being effectively tackled. This talk will provide an overview of the key environmental challenges with respect to water and how these are being addressed in northeastern Alberta. In so doing the talk is meant to dispel some of the fictions in an unapologetic attempt to focus attention on the most pressing environmental issues, especially the eventual return of water and its solutes to the Athabasca River system. Key to this debate is assurance that impacts are understood and are acceptable so I will review monitoring in the oil sands region, the current status of water quality and quantity in the Athabasca River and link this to emerging regulatory direction under the Lower Athabasca Regional Plan. Emerging techniques for performance evaluation and reporting, particularly the analysis of contaminants related to oil sands will also be briefly reviewed. The talk will conclude with an assessment of potential regulatory challenges, where flexibility must be considered to

reconcile potential conflicting goals (e.g. creation of storage to meet Instream Flow Needs vs. reduction of footprint and rapid tailings reclamation).

Dr. McEachern received his PhD from the University of Alberta dealing with northern hydrology and water quality. He has been with Alberta Environment for 10 years, a majority of which were with the Northern Region and now the Clean Energy Branch tackling oil sands related issues. His group is at the fore of issues such as tailings management, the creation of policy components for protecting water quality and quantity and in the public debates about sustainability of oil sands development. Dr. McEachern is active in research with adjunct professor appointments at the University of Alberta in Civil and Environmental Engineering supervising students in water quality and water treatment, at the University of Victoria supervising students in hydrology and at Lakehead supervising students in forestry and reclamation. Dr. McEachern has lived and worked in southwest Asia, Africa and the USA. He is an avid outdoor enthusiast with a passion for mountain climbing, running and skiing.

11:00 – 11:40 ENV/EME INVITED SPEAKER – “EMERGING OPPORTUNITIES FOR CONSERVATION MARKETS IN THE WESTERN CANADIAN SEDIMENTARY BASIN”

Presenter: Dr. Marian Weber (Canada)

Location: Stephen AB Room

The Western Canadian Sedimentary Basin is one of the largest deposits of unconventional energy in the world. Sustainable development of unconventional energy is a significant challenge and the sector must respond to increasingly stringent public demands for environmental accountability and minimization of environmental impacts. Alberta's Provincial Energy Strategy recognizes that energy development must properly account for cumulative effects and address the environmental footprint. In addition, The Alberta Oil Sands Plan identifies conservation offsets as a land management tool that could contribute to achieving desired conservation outcomes within Alberta's regional planning process. In this talk we will review market based approaches for addressing environmental liabilities associated with developing Alberta's non-conventional energy resources including reviewing existing legislation and options for implementing conservation offsets in the province. The talk will highlight the economic and ecological tradeoffs in designing conservation offsets, and discuss several implementation challenges, including determining baselines and nesting offsets within the existing regulatory framework.

The talk will increase industry's awareness of some of the challenges and opportunities for environmental offsets in Alberta, and identify technologies that could assist firms in project planning within an offset context.

Dr. Marian Weber leads Alberta Innovates - Technology Futures Environmental Planning and Economics Program where she works with government, industry, and NGOs on testing market based approaches for managing environmental services from land and water resources and developing technologies to assist firms in assessing their environmental footprint and contribution to cumulative effects. Areas of research include markets for biodiversity and ecological conservation on public and private lands, and water trading. She has co-authored a number of reports on the economics of biodiversity conservation in the boreal forest including "Catching Up, Conservation and Biodiversity Offsets in Alberta's Boreal Forest" with the Canadian Boreal Initiative, and Conserving Canada's Natural Capital: The Boreal Forest, Al-Pac Case Study for the National Round Table on the Environment and Economy. Most recently she has advised the Government of Alberta on options for conservation offsets in the oilsands. She has a Ph.D. in economics from the University of Alberta, is an Associate Editor of the Canadian Water Resources Journal, and is Adjunct Professor in the Department of Rural Economy, University of Alberta.

11:40 – LUNCH BREAK

Self-Catered

12:20 EME SESSION 2 – WATER MANAGEMENT

Chair: TBA

Location: Stephen AB Room

736-016

Multistep Ahead Water Level Forecasting using Different Artificial Neural Network Training Algorithms
Jianjun Yu, Xiaosheng Qin, and Ole Larsen (Singapore)

736-033

Optimal Groundwater Quantity Management for Land Subsidence Control
Yin-Lung Chang, Chuan-Yi Huang, Tung-Lin Tsai, Hung-En Chen, and Jinn-Chuang Yang (Taiwan)

736-035

Over-Dependence on Tubewell Irrigation Draining Out Groundwater Aquifers in the Food Bowl of India
Harmanjit S. Dhadli, Sukhpreet Singh, and Salwinder S. Dhaliwal (India)

736-045

Elastic Consolidation Settlement due to Periodic Pumping
John C.-C. Lu and Feng-Tsai Lin (Taiwan)

736-047

Electrochemical Oxidation of Crystal Violet Dye (Basic Violet 3) using Lead Oxide Electrodes
Indu M. Sasidharan Pillai, Ashok K. Gupta, and Chittaranjan Sahoo (India)

736-050

Improvement of Artificial Neural Network Model for the Prediction of Wastewater Treatment Plant Performance
Mohammed S. Jami, Nassereldeen A. Kabashi, Iman A.F. Husain, and Norhafiza Abdullah

736-051

Dispersion of Heavy Metals at Klein Letaba Gold Tailings Dam, Limpopo Province, South Africa
Jason S. Ogola (South Africa), Klaus Maas (Germany), and Khodani Matshusa (South Africa)

14:00 – EME SESSION 3 – AIR QUALITY, WASTE MANAGEMENT AND SUSTAINABLE BUSINESS

Chair: TBA

Location: Herald Room

736-006

Design and Implementation of Air Quality Data Mart for Ontario Canada
Samira Muhammad (Sweden)

736-012

The Effect of Profitability and Stock Price Performance from Corporate Participation in Environmental Programs
Catherine Boulatoff (Canada), Carol Boyer, and Stephen J. Ciccone (USA)

736-017

Solving Fuzzy Waste Management Models through Heuristic Searching
Xiaosheng Qin (Singapore), Ye Xu (PR China), and Tianyi Xu (Singapore)

736-029

Bricks: An Excellent Building Material for Recycling Wastes – A Review
Aeslina Abdul Kadir (Malaysia) and Abbas Mohajerani (Australia)

736-044

Research on the Development of Printing Consumables Remanufacturing in Shanghai
Yuan Zhou, Shengli Qiu, Wenjie Wu, Jingwei Wang, Chenglong Zhang, and Jianfeng Bai (PR China)

736-053

Effects of Fuel Tanks Explosion on Atmospheric Concentrations of PAHs in Catano, Puerto Rico
Jeannette Gonzalez-Soto and Nedim Vardar (USA)

736-062

Effect of Waste Household Appliances Trade-in Program in China
Wenjie Wu, Jingwei Wang, Yuan Zhou, and Chenglong Zhang (PR China)

736-064

Retrofit Design Method for CO₂ Emission Reduction
Mona Gharaie (UK), Jin-Kuk Kim (Korea), M. Hassan Panjeshahi (Canada) and Robin Smith (UK)

736-065

An attempt to develop sustainable land use management using Geoinformatics: A case study of Wurayah Biosphere Reserve, UAE
Eslam A. ALHOGARATY (UAE), Farouk El-Baz (USA), Reinhard Zölitz-Möller (Germany), Zein Rizk (UAE), Mohamed A. Abdel Moati (Qatar), and Hassan K. Garamoon (Egypt)

15:00 – 15:30 COFFEE BREAK

Location: TBA

15:30 – EME SESSION 3 CONTINUED

Location: Herald Room

15:30 – ENV SESSION 3 – OIL SANDS TAILINGS WATER TREATMENT

Chair: TBA

Location: Stephen AB Room

731-011

The Use of the Exfoliated Graphite for the Removal of the Aqueous Napthenic Acids
Ahmed Moustafa (Canada), Seoktae Kang (Korea), and Mohamed Gamal El-Din (Canada)

731-020

Decomposition of a Model Naphthenic Acid, Cyclohexanoic Acid by Advanced Oxidation Processes

Atefeh Afzal, Przemyslaw Drzewicz, Mohamed Gamal El-Din, and Jonathan W. Martin (Canada)

731-025

Degradation of Naphthenic Acids by Ozonation in Various Conditions: Uncovering the OSPW Ozonation

Leonidas A. Perez-Estrada, Mohamed Gamal El-Din, and Jonathan W. Martin (Canada)

731-019

The Assessment of the Solar Driven UV/Chlorine Advanced Oxidation Process

Po Yee Chan, Mohamed Gamal El-Din , and James R. Bolton (Canada)

731-023

Dissolved Organic Compounds Removal from Oil Sands Process Affected Water by Coagulation/Flocculation

Parastoo Pourrezaei, Przemyslaw Drzewicz, Yingnan Wang, Mohamed Gamal El-Din, Leonidas A. Perez-Estrada, Jonathan W. Martin, Julie Anderson, Steve Wiseman, Karsten Liber, and John P. Giesy (Canada)

731-018

The Coagulation-Flocculation-Sedimentation Treatment of Oil Sands Process-Affected Water for High Pressurized Membrane Filtrations

Eun-Sik Kim, Yang Liu, and Mohamed Gamal El-Din (Canada)

IASTED would like to thank you for attending ENV and EME 2011. Your participation helped make this international event a success, and we look forward to seeing you at upcoming IASTED events.
