

ATLANTIC RECLAMATION CONFERENCE 2009: "From the Ground Up"
**Bringing together people, ideas, and technology involved in reclaiming the earth in
Atlantic Canada**

November 3rd - 5th, 2009 | Pier 21, Halifax, Nova Scotia

Abstracts & Bios

SOIL SCIENCE

Wednesday, November 4th | Soil Science | 8:15 am to 8:45 am

Upcoming Regulatory Changes to Contaminated Sites Management in NS

*Gordon G. Check, Project Leader Contaminated Sites Regulatory Development, Nova Scotia
Environment*

Brief: NS Environment is developing a new regulatory framework and tools to assist in the management of contaminated sites. This includes changes to regulatory requirements, changes to the environmental site professional accreditation system, new generic Tier I numerical soil and water standards and developments affecting the regulatory liability of contaminated sites

Abstract: Nova Scotia Environment currently relies on a variety of existing policy tools and voluntary guidelines to promote the management of contaminated sites. Staff are developing new components of a broad-based regulatory strategy for improving contaminated sites management in Nova Scotia, in keeping with goals expressed in the Environmental Goals and Sustainable Prosperity Act (2007). These changes will affect many elements of current practice, including requirements of new comprehensive contaminated site regulations, changes to improve the environmental site professional accreditation system, implementation of comprehensive Tier I numerical soil, water and sediment standards, changes allowing greater streamlining of file closures for all sites and additional measures to allow release from environmental regulatory liability on a case-by-case basis, subject to extensive regulatory review with cost recovery.

Bio: Gordon G. Check, M.A.Sc., P.Geo., received his Honours degree in Geology from Dalhousie University in 1989 and his Masters of Applied Science degree in Groundwater Studies from the Civil Engineering Department of the Technical University of Nova Scotia (now DalTech) in 1992. Gordon has over 17 years experience in the environmental field. He has 10 years environmental consulting experience as a project manager for a major Atlantic environmental engineering and geoscience firm. More recently he has worked for the province at NS Environment for 7 years providing a wide variety of hydrogeological, geoscience and regulatory management expertise for the development, regulation, management and protection of land and water resources. Gordon served as President for the Association of Professional Geoscientists of Nova Scotia (APGNS) in 2006-2007 and currently continues to advise the Association. Gordon is currently the Project Leader for the development of Contaminated Sites Regulations at NS Environment.

Wednesday, November 4th | Soil Science | 8:45 am to 9:15 am

The Role of Soil and Site Pre-Disturbance Assessments in Reclamation Planning

Kevin Keys, MSc, RPF, PAg, Forest Ecologist/Soil Scientist, Stantec Ltd.

Brief: This presentation will discuss the importance of pre-disturbance site assessments in developing ecosystem based reclamation plans.

Abstract: In its Toward Sustainable Mining guiding principles document (2004), The Mining Association of Canada states that its members will "... seek to minimize the impact of operations on the environment and biodiversity through all stages of development...and...practice continuous improvement through the application of new technology, innovation, and best practices in all facets of operation..." One way MAC members in Atlantic Canada can meet these principles is to conduct comprehensive soil and site pre-disturbance assessments (PDAs) and to use this information to develop site-specific reclamation plans which aim to restore ecosystem function (rather than simply achieving minimum standards of green-up on safe slopes). In this presentation, the role of PDAs in ecosystem based site reclamation will be discussed, along with examples of PDA requirements in other parts of Canada. In addition, an overview of tools and resources currently available to support this approach in Nova Scotia will be presented.

In this session you will learn: 1) How comprehensive pre-disturbance assessments (PDAs) can contribute to ecosystem based site reclamation. (2) How this approach is applied in other jurisdictions in Canada. (3) What tools and resources are available in Nova Scotia to conduct comprehensive PDAs.

Bio: Kevin Keys is a forest ecologist and soil scientist with expertise in ecosystem classification, soil classification, and related management interpretations. He has almost 20 years experience working throughout Maritime Canada, as well as in Labrador, British Columbia, Alberta, and Saskatchewan. He was a leading member of the team which developed Nova Scotia's new forest ecosystem classification (FEC) system and he is the author of *Forest Soil Types of Nova Scotia: Identification, Description, and Interpretation*

Wednesday, November 4th | Soil Science | 9:15 am to 9:45 am

Surfactant Enhanced Desorption of PAH's Improving Their Biological, Chemical and Hydraulic Availability for In-situ and Ex-situ Remediation

George A. Ivey, B.Sc., CES, CESA, P.Chem., President and Senior Remediation Specialist, Ivey International Inc. Campbell River, BC

Brief: Application of surfactant enhanced desorption techniques to desorbed Polycyclic Aromatic Hydrocarbons (PAH) using non-ionic surfactants to improve their availability for in-situ and ex-situ treatment of contaminated soil, sediments and groundwater.

Abstract: This paper will focus on the application of surfactant enhanced desorption techniques to desorb sorbed Polycyclic Aromatic Hydrocarbons (PAH) using non-ionic surfactants to improve their availability for in-situ and ex-situ treatment of contaminated soil, sediments and groundwater. Normally PAH's exhibit limited solubility in water as the contaminants tend to partition and sorb (i.e., absorbs and or adsorbs) onto the soil, sediment or bedrock surfaces. This partitioning can account for as much as 90% or more of the total contaminant mass. Consequently the subject contaminants exhibit a limited degree of 'availability' for in-situ and or ex-situ treatment. This

includes technologies such as: pump and treatment, bioremediation, chemical oxidation, chemical reduction, soil washing and thermal desorption. Hence certain PAH's can persist in soils, bedrock, solid waste, wastewater and or groundwater for extended periods. The sorption of PAH's onto solids is considered the principal limiting factor affecting the effectiveness of most treatment technologies. This coupled with complex chemistry, geology and hydrogeology only further complicates matters. Surfactant enhanced desorption involves the use of surfactant formulations to selectively desorb and dissolve (i.e., make miscible) target PAH contaminants from the solid to liquid phase. In addition, the surfactants will lower the surface tension of water from 72 dynes to <30 to 40 dynes increasing the wetting and permeability properties of water in fine grain soil, sediments and bedrock fractures. The surfactants affect the sorption of PAH's at the solid-liquid interface (i.e., the surface-H₂O-PAH interface). As a result, the surfactants increase the PAH solubility and improved 'availability' for rapid and cost effective treatment.

Bio: Mr. Ivey is the President and Senior Remediation Specialist with Ivey International Inc. He has over twenty years of environmental experience, and has worked on more than 1200 projects worldwide. His background includes: Organic Chemistry, Geological Engineering, and a Master's Certification in Project Management. He holds several international patents; continues to conduct applied soil, solid waste, waste water, and groundwater research, and is currently working on several remediation projects around the world. Among some of his more recent accomplishments include his being awarded:

- The 2007 Environmental Business Journal Achievement Award: Bronze Medal, February 20, 2008;
- The 2006 North American Frost & Sullivan Award for Technology Innovation, February 7, 2007;
- The 2006 Environmental Business Journal Remediation Technology Merit Award, February 28, 2007;
- The 2006 Globe Award for Environmental Innovation & Application, on March 31, 2006.

Wednesday, November 4th / Soil Science / 9:45 am to 10:15 am

The Scotia Steel Plant and Tobin Road Mining Areas

Gary Campbell, President, Nova Scotia Lands Inc.

Craig Chandler, M.Sc., P. Eng, Senior Project Manager, SLR Consulting (Canada) Ltd.

Brief: The Province of Nova Scotia owns two areas of former industrial lands in Sydney Mines that are part of the Sydney Steel Corporation legacy. Reclamation efforts have been initiated.

Abstract: Nova Scotia Lands Inc., with consultant SLR Consulting, is investigating the environmental and safety condition of former industrial properties in Sydney Mines, Nova Scotia in order to determine land reclamation needs. Between 1901 and 1920, the Nova Scotia Steel and Coal Company ("Scotia") operated a steel plant in Sydney Mines, Nova Scotia. Coke ovens, blast furnaces, and other buildings were spread over 100 acres between Pitt Street and Florence Beach. The site is now vacant except for large foundations. The community uses it as a recreational area. To the southwest is group of properties that were the home to several small-scale commercial coal mines from the late 1800s until the 1960s. The expression of these workings can be found across the site and are potentially causing subsidence- and ARD-related issues. The local community also uses this property for recreational purposes. Phase I Environmental Site Assessment reports have been completed for the two sites and further work is planned for 2010.

In this session, you will learn about the history, condition, and environmental concerns associated with these properties; the technical and logistical challenges associated with investigating and reclaiming lands that have become largely reforested; and the safety and community relations issued in the context of significant public use of the sites.

Bios:

Gary Campbell is a resources planner with 25 years of project management experience with the Province of Nova Scotia, where he is responsible for ensuring that private contractors deliver services in accordance with contractual obligations. His activities include major Federal-Provincial initiatives ranging from the provincial chair of the \$200 million Canada-Nova Scotia Offshore Development Fund to his present role as President of Nova Scotia Lands Inc. and the provincial lead on the \$400 million Federal-Provincial Sydney Tar Ponds and Coke Ovens Remediation Agreement. He is also President of Harbourside Commercial Park, the crown corporation established to redevelop the former Sydney Steel site.

Craig Chandler is an environmental engineer with over 15 years of experience in environmental assessment and auditing, and institutional and industrial reclamation projects. Since 2001, Craig has been the SLR project manager for the environmental decommissioning of the former SYSCO property in Sydney, Nova Scotia. Craig also assists NS Lands with the investigation and reclamation of other former SYSCO properties. This involves the historical research, assessment of soil and groundwater, and the investigation of abandoned structures and mine workings.

Wednesday, November 4th / Soil Science / 10:30 am to 11:00 am

Risk-Managed Property Ownership: To Be or Not To Be?

Dr. Scott MacKnight, Ph.D., CEA, CESA, President, OCL Services Ltd./OCL Group Ltd.

Brief: Atlantic PIRI-RBCA provides for an established risk assessment and management approach to managing petroleum hydrocarbon contamination, with a “common approach” throughout Atlantic Canada. However, many buyers/owners and their financing companies prefer to avoid a “risk managed” approach, opting for minimal to no risk. The two approaches to managing chemical contaminants within a property will be discussed.

Abstract: Most property owners or buyers and their associated mortgage companies have little to no understanding of the many chemical contaminants that may be associated with a property. The limited understanding results in a general view that any contamination is a liability and therefore unacceptable. In contrast, Atlantic PIRI-RBCA provides for an established risk assessment and management approach to managing petroleum hydrocarbon contamination. Using the Atlantic PIRI-RBCA approach, properties can continue to be occupied or developed within a “risk managed” scenario, at least for petroleum hydrocarbons, a common property contaminant. Difficulties and limitations in the two approaches are discussed.

Bio: Dr. Scott MacKnight, CEA, is president of OCL Group. This is a Nova Scotian based and owned environmental management firm specializing in the assessment, remediation and management of chemical contaminants in properties, buildings, workplaces and residences. Scott has managed many of the larger brownfield projects in the Maritimes, as described in various recent issues of *Canadian Reclamation* magazine. He has 33 years experience in the field of contaminant assessment and management.

Wednesday, November 4th / Soil Science / 11:00 am to 11:30 am

Atlantic PIRI and Land Reclamation: Continuous Improvement

Dan Hemsworth, Hydrogeologist/Contaminated Site Specialist, Pollution Prevention Branch, Environmental and

Natural Areas Management, Nova Scotia Department of Environment, Halifax NS

Michel Poirier, Remediation Engineer, NB Environment, Stewardship Branch, Fredericton NB

Abstract: Harmonization enables Atlantic Canada to move forward successfully and effectively with contaminated site management. It is the underlying vision and objective that drives Atlantic PIRI, and the development and continuous improvement of Atlantic RBCA. Through discussion with their peers and leaders in industry, regulators in Atlantic Canada harmonize their approaches, reducing uncertainties for both the regulators and the public, and facilitating contaminated site remediation and Brownfield redevelopment in the region.

Bios:

Dan Hemsworth is a Hydrogeologist and Contaminated Sites Specialist and has been with the Department of Environment and involved with contaminated sites for 20+ years. An active member as the Departments representative on the Atlantic PIRI Committee and Chair of the Regulators Sub-Committee, working to harmonize approaches and processes to address issues of mutual concern on remediation of Brownfield sites in the Atlantic Provinces. Working together with the other members of the Atlantic PIRI Committee, issues related to Atlantic Risk Based Corrective Action, Brownfields redevelopment and regulations dealing with contamination in Nova Scotia and the Atlantic Provinces have been a priority for Dan and the Department.

Michel Poirier is from northern New Brunswick and in 1998, received his bachelor degree in Civil Engineering from the Université de Moncton. In 2002, Michel obtained his professional engineer designation, which has facilitated his management of hundreds of contaminated sites with the New Brunswick Department of Environment for the past 8 years. Michel was an environmental inspector in the Bathurst regional office for 3 years and since 2003, is a remediation engineer with the Department's central office in Fredericton. He is an active member of the Atlantic PIRI Committee working to harmonize Atlantic RBCA within the Atlantic Provinces. He is also working closely with his peers to advance the remediation program and to implement a brownfields redevelopment strategy in New Brunswick.

Wednesday, November 4th / Soil Science / 11:30 am to 12:00 pm

Concurrent Reclamation Practices at the Point Aconi Surface Coal Mine

Dan Khan, P.Eng., Planning and Development Officer, Mineral Development and Policy Section, Nova Scotia Department of Natural Resources

Paul White, Pioneer Coal

Helen MacLeod, Nova Scotia Department of Natural Resources

Abstract: Pioneer Coal Limited has operated several surface coal mines in Nova Scotia during the past three decades. This presentation will focus on current reclamation practices being employed at the Point Aconi Reclamation Mining project where remaining near surface coal resources are being recovered following the closure of the underground Prince Mine and in areas of past "bootleg" (illegal) mining. The Nova Scotia Department of Natural Resources has undertaken a

study to improve reclamation results at surface coal mines. The Surface Coal Mine Reclamation Enhancement Initiative was announced in April 2006 and the committee overseeing the project has initiated research to increase benefits related to lands reclaimed following surface coal mining. Some of the ideas and methodologies developed through the DNR committee work are now being applied at the Pioneer Coal project. DNR and Pioneer Coal are collaborating by documenting procedures being used at the mine and the results gained from the work will be shared with the Committee. Vegetation surveys are being conducted to assess the results of current work which may be compared to previous reclamation results.

Bios:

Helen MacLeod is a horticulturist that graduated from the University of Guelph and has worked for the Nova Scotia Dept. Natural Resources for the past 20 years at the historical Petersfield park near Sydney, Cape Breton. Some of her duties have included restoration of original gardens, nature trail construction, and supervising park maintenance crews. For the past three years Helen has conducted vegetative surveys and supervised test work at several former mine sites in Cape Breton County examining the results of surface coal mine reclamation methods.

Daniel Khan - Since graduating with a Bachelor of Engineering degree in Mining from Dalhousie University, Dan has been employed as a mine engineer/supervisor and quality and environment manager at several mines and manufacturing plants within the province. He has also worked for both the federal and provincial governments in environmental and resource management roles.

Dan is currently employed as a Program and Development Officer by the Mineral Development and Policy Section at the Department of Natural Resources in Halifax.

Wednesday, November 4th / Soil Science / 12:00 pm to 12:30 pm

5 Wing Goose Bay Remediation Project

Craig Wells, Goose Bay Remediation Project Manager, Department of National Defence

Brief: The Department of National Defence faces a number of challenges to manage, plan and execute a large-scale remediation project in a remote area. The legacy of environmental contamination at 5 Wing Goose Bay will be addressed through practical application of remediation and risk management techniques over the next decade.

Abstract: The Department of National Defence (DND) is currently managing over 100 contaminated areas – spread over more than 5,400 hectares - at 5 Wing Goose Bay. Environmental contamination at the Wing can be attributed to several sources. Hydrocarbon plumes can be attributed to leaking storage tanks, leaking or ruptured pipelines, and historical management and containment practices. Heavy metals and other chemical contamination are due to historical waste disposal practices and the existence of numerous dumpsites. Access to 5 Wing is mostly unrestricted, and approximately 20% is comprised of wetlands. This creates a considerable habitat for aquatic and terrestrial receptors, along with people working on the Wing and using the land for recreational purposes. DND will develop and implement a comprehensive, multi-phase remedial action plan. Instead of independently assessing each site, DND is collectively considering all sites to achieve economies of scale, address cumulative affects (positive and negative) and optimize logistical considerations.

In this session, you will learn about the challenges faced by the Goose Bay Remediation Project, how the project team plans on dealing with them, and how the various stakeholders from Federal, provincial and municipal governments, other interest groups, and industry will be involved.

Bio: Mr. Wells is a Civil-Environmental Engineer who has worked with the Department of National Defence for the past 5 years on the management of contaminated site remediation projects, and is currently the Project Manager for the Goose Bay Remediation Project. Prior to his current post he held other positions within DND and Environment Canada, and worked for a private sector environmental consulting firm before joining the Public Service in 2002.

LUNCHEON KEYNOTE

Wednesday, November 4th / Luncheon Keynote / 12:30 pm to 1:30 pm

Biochar as a Tool for Soil Management: Environmental and Agricultural Benefits

Julie Major, Extension Director, International Bio-Char Initiative

Abstract: This talk will provide an introduction to the technology of applying biochar to soil with the goal of reaping a variety of agricultural and environmental benefits. These include improved plant growth, carbon sequestration in soil, reductions in soil emissions of greenhouse gases, as well as the sorption of a variety of pollutants. The mechanisms underlying observed benefits will be explored, and practical aspects of working with biochar will be reviewed.

Bio: Julie was raised on a farm outside Montréal in Canada. She completed a B.Sc. degree with a major in Plant Science at McGill University in Montréal in December 2000. She became interested in tropical agriculture as an undergraduate, during a field semester in Panamá. After completing an internship with the Canadian International Development Agency (CIDA) in the Dominican Republic in the first half of 2001, she undertook an M.S. degree at Cornell University where she studied weed dynamics on Terra preta de Índio soils of the Brazilian Amazon. She graduated in 2004 and immediately started her Ph.D. Working on Terra preta soils sparked her interest in studying biochar as a soil amendment, and she obtained her doctorate degree from Cornell in May 2009. Since January 2009, she has been working as the Extension Director for the International Biochar Initiative.

STREAM RESTORATION AND WETLANDS

Wednesday, November 4th / Stream Restoration and Wetlands / 1:30 pm to 2:00 pm

Drafting a New Wetland Conservation Policy for Nova Scotia

John Brazner, Wetland/Water Specialist, Nova Scotia Environment

Brief: This presentation discusses the process used to draft a new conservation policy for Nova Scotia and how the results of that process shaped final recommendations.

Abstract: Enacted in 2007, the Environmental Goals and Sustainable Prosperity Act (EGSPA) mandates that government develop a policy to prevent the net loss of wetlands by the end of 2009. This presentation will include a discussion of the process used to draft a new wetland conservation policy for Nova Scotia to meet this EGSPA target. The specific objectives and provisions designed to prevent the net loss of wetlands contained in the current draft will also be presented with the intent of generating feedback that can be used to shape the final version of the policy.

Bio: Dr. John Brazner has been the Wetland/Water Specialist with Nova Scotia Environment in Halifax since September of 2008. He has been coordinating the development a policy to prevent the net loss of wetlands in Nova Scotia as part of meeting one of the targets mandated by the Environmental Goals and Sustainable Prosperity Act. In past lives, John worked on a number of projects with the Department of Fisheries and Oceans including Atlantic Salmon and Striped Bass Population Assessments, Recovery Potential Assessments for Atlantic salmon, loggerhead turtles and mako sharks and has also been working on a collaboration with the USGS monitoring the effects of climate change on coastal wetlands in New England, Nova Scotia and New Brunswick. Before moving to Nova Scotia in 2004, he worked for almost 20 years a Research Fish and Wetland Biologist with the U.S. Environmental Protection Agency on Lake Superior studying the effects of human activities on Great Lakes coastal wetlands and tributary streams. John received his Ph.D. from the Center for Limnology at the University of Wisconsin - Madison in 1994 and spends much of his free time these days trying to get lost in the backlands near Herring Cove, Nova Scotia.

Wednesday, November 4th | Stream Restoration and Wetlands | 2:00 pm to 2:30 pm

Lake Charlotte Boat Launch Site – Alteration and Compensation, A Case Study

Doreen Chenard, B.Sc. in Agr., Manager, Environmental Assessments, Maritime Testing Ltd.

Rebecca Mason, B.Sc., Master of Applied Science Candidate, Biological Engineering Program, Dalhousie University

Brief: A case study of the environmental permitting challenges and compensation project for the alteration of a wetland to permit construction of a new community boat launch in Lake Charlotte.

Abstract: This case study illustrates the challenges involved in the site selection, design process, environmental permitting, and negotiations with Nova Scotia Environment required to move forward with the community based project. Following the successful realization of a *Wetland Alteration Approval*, the case study continues with the innovative research project, its planning and objectives, that is currently being carried out as a compensation project for the Lake Charlotte wetland alteration in conjunction with a thesis project for Master of Applied Science candidate in the Biological Engineering Program at Dalhousie University. The objectives of the compensation project are to evaluate field methods used to restore small scale wetland disturbance and to recommend the best habitats for restoration and best restoration techniques to achieve successful future restoration of wetland damage in the future. The project evaluates three different wetland habitat restorations, using different restoration protection techniques, restoration vegetation, and fertilization. Extensive field monitoring is underway; statistical analysis and qualitative measurements will be used to recommend the most successful methods that can be applied to future wetland restorations.

In this session, you will learn: the process followed during development on a site that will involve alteration of a wetland, and the innovative research project used for compensation of the alteration.

Bios:

Doreen Chenard is Manager of the Environmental Division at Maritime Testing, a local consulting engineering and environmental sciences firm. She has spent most of her 12-year career focusing on environmental site assessments, and remediation and risk assessment of in contaminated sites. Several years ago she built upon her environmental biology and agricultural background by taking

specialized training in wetland plant identification and wetland delineation in Massachusetts following the US Army Corps of Engineers methodology. Doreen uses this specialized skill set to solve environmental challenges related to new development in greenfields and redevelopment of brownfields.

Rebecca Mason is currently completing a Master of Applied Science degree in the Biological Engineering Program at Dalhousie University. Rebecca is specializing in the field of constructed wetlands, after completing an Undergraduate degree in Biology and Environmental Science at Connecticut College in New London, Connecticut, USA.

Wednesday, November 4th | Stream Restoration and Wetland | 2:30 pm to 3:00 pm

Nova Scotia Transportation and Infrastructure Renewal (NSTIR) Portfolio of Habitat Banks for HADD and Wetland Compensation

Dr. Bob Pett, Environmental Analyst, Environmental Services Section, Nova Scotia Transportation and Infrastructure Renewal, Halifax, NS

Brief: As part of fish habitat and wetland compensation requirements, NSTIR has developed large, habitat restoration projects at seven salt marshes, two wetland complexes, three rivers, one harbour and one lake (collectively over 200 hectares of fish and wetland habitat). This presentation will showcase the variety of projects and successes (no failures to date).

Abstract: Since 2005, NSTIR has been developing partnerships with other government departments, NGOs, consultants, academia and local residents to conduct larger-sized restoration projects in a variety of damaged habitats around NS. Our approach has been to maximize the environmental, economic and community benefits by relying on best available scientific advice and monitoring programmes. We restore more habitat than is required by government regulators for fish habitat (HADD) and wetland compensation (i.e., more than two or three times as much area as damaged) and bank the extra "habitat credits" for use in the future when our work is likely to cause further unavoidable damage to a stream, lake, wetland or coastline. Compensation is often done before construction and we will have a good understanding of project success based on the results of long-term, typically five year, monitoring programmes. Our banking system saves us (proponents) time and costs, ensures the successful completion of high value projects, and builds the growing pools of science and management information that is so necessary for this region. NSTIR is also very pleased to have NGOs and other individuals and organizations from around the Province approach us with new potential candidate sites. We look forward to further discussion with other stakeholders to work on these projects and, or populate federal/provincial restoration databases for consideration by other proponents.

Bio: Dr. Bob Pett works in the Environmental Services Section of NS Transportation and Infrastructure Renewal, at the head office in Halifax. He is responsible for environmental aspects of highway planning, construction and maintenance, fish habitat, wetland and salt marsh restoration, and environmental monitoring programmes. Many of NSTIR's restoration projects are highlighted on our website: <http://www.gov.ns.ca/tran/enviroservices/>. Lately, Dr. Bob has also been involved with invasive plant issues and the newly-formed *Invasive Species Alliance of Nova Scotia* (see <http://www.invasivespeciesns.ca/>). Dr. Bob is an oceanographer by training (Guelph and Dalhousie) and has worked around the world focusing on freshwater and marine science and environmental management.

Wednesday, November 4th | Stream Restoration and Wetlands | 3:30 pm to 4:00 pm

20 Years Restoring the Sackville River

Walter N. Regan, President, Sackville Rivers Association

Abstract: Walter Regan will present case studies on stream restoration methods recently used on the Sackville River and several other smaller brooks locally in Halifax. He will present current technology normally used such as digger logs, rock sills, deflectors and bank stabilization methods. He will also be talking about new technologies recently used in The Sackville River and other local streams such as gradient controls, fish spawning beds, stream daylighting, and stream enhancement projects (including the fish amphitheatre) in a local development called Dartmouth Crossing, Dartmouth.

Bio: Walter first became a volunteer with the Sackville Rivers Association (SRA) in 1988, became Executive Director in 1995, and has been President since 2002. As a volunteer he helps clean up the Sackville River Watershed and to bring back the Atlantic Salmon to the Sackville River and Halifax Regional Municipality. In addition to his many volunteers hours with the SRA, it is a long list of groups, committees and organizations that he belongs to and helps with, to name a few, such as 2nd Lake Provincial Park, Sackville Heritage, Sackville River Walkway and HRM Trails, Nova Scotia Salmon Association, HRM Waters Advisory Board, Halifax Harbour Clean-Up Advisory, founding member of HRDA, Sackville Region, Chairmen of its Natural Resources Committee. Founding member of the SCDA, member of the Atlantic Salmon Federation, Sandy Lake Ratepayers Committee, Sackville Drive Design Committee, Heritage Park Committee, Sackville Patriot Days and First Lake Patriot Days Fishing Tournament, Director on the Cultural Centre for Sackville and sat on the Briston Development Advisory Committee in Bedford, Middle Sackville Visioning Committee.

Wednesday, November 4th | Stream Restoration and Wetlands | 4:00 pm to 4:30 pm

Key Considerations in the Design of Stream Channels and Fish Habitat on Reclaimed Land

Derick Fritz, President, Senior Biologist, Ocean Valley Associates Consulting Ltd.

Brief: Using a combined engineering and biological approach to identify key considerations in designing fish habitat restoration/enhancement projects on reclaimed land.

Abstract: The loss of fish habitat and watercourses integrity often outweighs successful habitat and watercourse restoration and enhancement projects. The success of many projects has been limited due to over emphasis on engineering considerations and not enough emphasis on ecological considerations and vice versa. To enhance the success of fish habitat and watercourse design a well rounded knowledge of the system is of paramount importance. Key factors to be addressed include geology and geography of the landscape, chemical properties of the material to be used, understanding the system, knowing what is up stream and the base level controls, and what are the target species for which the project is designed. Often projects are designed with insufficient planning around these key factors and less consideration given to the accrual design. A successful project is designed to meet overall key objectives while providing adequate habitat in which target species can thrive while obtaining the best value in terms of overall costs.

This session will introduce the key considerations in stream channel and fish habitat design; express the importance of understanding the system in which one works and the systems being designed; discuss the importance of a multi-faceted approach to fish habitat design; and highlight the importance of the engineering, biological, and geological considerations play in fish habitat design and how they relate to each other.

Bio: Derick Fritz has been an environmental consultant and business leader in Atlantic Canada for 10 years and has worked with two large environmental consulting firms in Atlantic Canada before branching out and developing a new company. He is a Senior Environmental Professional and President of Ocean Valley Associates Consulting Ltd. (OVAC.ca) based in Atlantic Canada. Derick comes from the Annapolis Valley, Nova Scotia where he attended Acadia University obtaining a degree in biology and another in geology. Derick's academic background focused heavily on understanding the connections between aquatic ecology and fluvial geomorphology. With extensive experience in project management, fisheries and aquatic sciences, and permitting and planning, Derick uses an innovative skill-set to bring environmental solutions to his clients. With his comprehensive understanding of the issues and regulations, he efficiently bridges the gap between project conception and completion.

Wednesday, November 4th | Stream Restoration and Wetlands | 4:30 pm to 5:00 pm

Restoration and Reclamation of Two Brooks at the Site of a Former Rock Quarry and Asphalt Plant: Grassy Brook and Frenchmans Brook – Dartmouth Crossing

Damon Conrad, Environmental Engineer-in-Training, Environmental Design and Management Ltd.

Brief: This presentation outlines how two brooks impacted by quarry and asphalt operations had been reclaimed and restored to improve both habitat and fish passage. Topics include daylighting, channel re-alignment, constructed spawning beds, habitat improvement/creation, and how the Dartmouth Crossing development has integrated habitat protection techniques into its design.

Abstract: Quarry and heavy industrial operations on the Former Countryview Property (presently Dartmouth Crossing) date back to the 1950's. The site has been subjected to material excavation as well as the dumping of various waste materials, changing the hydrology of the site, resulting in Frenchmans Brook and Grassy Brook requiring restoration. Restorative activities on these two brooks included regrading, channel adjustments, creation of a natural riffle/pool sequence, improvements to fish passage, daylighting, and construction of spawning beds. To complement the restorative actions taken, the design and layout of this development was achieved through careful consideration of the hydrology of the site, with attempts to emulate pre-quarry site conditions. Road/parking lot runoff (collected in stormwater detention ponds) and roof water is slowly released to the watercourse, avoiding rapid and high stormwater peak flows into the brooks. This presentation will show how impacted watercourses can be restored, and how the surrounding land can be developed in a sustainable manner. In this session you will learn how impacted watercourses can be returned to a healthy state, how habitat can be improved or created, and how impacts of large-scale developments can be greatly minimized.

Bio: Damon Conrad is an Environmental Engineer-in-Training who has worked in both the non-profit and private sectors since 2000 in the field of stream restoration.

Wednesday, November 4th | Stream Restoration and Wetlands | 5:00 pm to 5:30 pm

Closing Remarks

Bill Borland, Board of Directors of the *Canadian Water Network*, the *Canadian Rivers Institute*, and the *Research and Productivity Council of NB*, and Vice-President of Canadian Federal Programs, *AMEC Earth and Environmental*

Bio: Bill graduated from UNB in Fredericton, New Brunswick in 1973 with a degree in Biology. He worked for a number of years with the New Brunswick Department of the Environment before spending ten years with New Brunswick Power as Manager of Environmental Planning, then 18 years as Director of Environmental Affairs for J. D. Irving Limited in Saint John, New Brunswick. Bill recently joined AMEC Earth and Environmental as Vice President, Canadian Federal Programs. Bill is presently the Chairman of the Board of Directors of the Canadian Water Network and also sits on the Board of Directors of the Canadian Rivers Institute and the Research and Productivity Council of New Brunswick. Bill has been appointed to both the Premier's Round Table on Environment and the Economy in New Brunswick and the National Round Table on Environment and the Economy.

GREEN HORIZONS

Thursday, November 5th | Green Horizons | 8:00 am to 8:30 am

Getting back to basics: Addressing the Environmental Challenges in Land Reclamation

Dr. Richard Donald, Vice President Research, Extension and Outreach, Nova Scotia Agricultural College

Abstract: Adequately addressing Land Reclamation problems requires a comprehensive and holistic approach that involves the natural and social sciences. In terms of technical training for land reclamation specialists, an understanding of the fundamentals of soil and plant sciences will equip reclamation professionals with the tools to address all reclamation challenges, in whatever environment; yet, our training in these areas is often prescriptive, often leading to inappropriate or ineffective solutions. As an introduction to this panel I will briefly talk about fundamental skills that should be part of the reclamation curriculum as well as some emerging areas of research that support soil and plant sciences and the reclamation industry.

Bio: Dr. Richard Donald BSc, MSc, PhD Soil Science and Agronomy. An experienced consultant and educator in the fields of agronomy and the environment, Richard Donald has led a distinguished career which has taken him across the globe; as a CUSO Volunteer and agronomist in Nicaragua, a Lead Environment Scientist for Compliance at Qatar Petroleum, Doha Qatar and most recently as Principal and Business Unit Director, International with Jacques Whitford Limited. As a researcher and consultant, Richard has been applying his skills in agronomy and soil science to a wide range of reclamation projects in Canada and internationally, from Voisey's Bay Labrador to Niger, Africa and many places in between.

Currently Richard is Vice President Research, Extension and Outreach at the Nova Scotia Agricultural College where he will work with researchers and educators as a catalyst to drive transition and innovation in the bioresource and agri-food sectors in Atlantic Canada.

Thursday, November 5th | Green Horizons | 8:30 am to 9:00 am

Enhancing Collaborative Environmental Research and Industrial Training Opportunities in Atlantic Canada

Dr. Richard Isnor, Manager, Natural Sciences and Engineering Research Council of Canada—Atlantic

Brief: The presentation will illustrate different aspects of NSERC-supported research collaborations in the environmental sciences and engineering involving companies, academia and students.

Abstract: Natural sciences and engineering research underpin several significant segments of the Canadian and Atlantic Canadian economies. Recent analysis shows significant employment prospects for professionals working in natural sciences and engineering occupations. Recently, NSERC has developed a new Strategy for Partnerships and Innovation – which emphasizes research collaboration with the private sector, as well as enhanced student training opportunities

in industrial research. Examples drawn from environmental sciences and engineering will illustrate the impacts of this research in both academic and industrial settings.

In this session examples of NSERC-supported research collaboration in the environmental sciences and engineering from across Canada will illustrate what NSERC is trying to achieve with investments in different types of research partnership and industrial scholarship programs.

Companies will have a better idea of how they can partner with university and college researchers, as well as involve students from Atlantic Canada in their research operations.

Bio: Richard Isnor is Manager of the Atlantic Regional Office for the Natural Sciences and Engineering Research Council of Canada (NSERC-Atlantic), based in Moncton, NB. Previously, he was Director of Innovation Policy and Science at the International Development Research Centre in Ottawa. Richard holds a Ph.D. in Science and Technology Policy Studies from the University of Sussex, UK; a Master's in Environmental Studies from Dalhousie University, Canada; and a B. Sc. in Biochemistry from Mount Allison University, Canada. He has held science and technology policy and management positions in a variety of federal government organizations, including the National Research Council of Canada, Environment Canada, Natural Resources Canada and the Privy Council Office. NSERC is Canada's primary federal agency supporting research in the natural sciences and engineering. NSERC's goal is to help make Canada a country of discoverers and innovators for the benefit of all Canadians.

Thursday, November 5th / Green Horizons / 9:00 am to 9:30 am

Spatial Decision Support Systems (SDSS) for Reclamation Planning and Mitigation

Chad Amirault, VP Business Development of Spatial Energistics Group Inc.

Brief: Using GIS-based modeling and analysis to minimize your project risks by providing solutions that assist in making informed decisions based on facts.

Abstract: Land reclamation related to the mining industry is truly interdisciplinary. The data to be dealt with involves the fields of mining, geology, geography, soil, agriculture and forest, biology, society, economy, etc, with the characteristic of plenty of data and complicated relationships. This paper describes the development and applications of a Spatial Decision Support System (SDSS) that uses the diverse spatial information in order to make more informed decisions. This SDSS can enable the various levels of the target groups to easily identify the best available solutions of reclamation problems. To make informed decisions, the overall purpose of the SDSS is to provide a support tool for site evaluation and selection of the most appropriate reclamation solutions. The system consists of three models: (1) an evaluation model for reclamation potentiality based on the physical, chemical, and biological growth-limiting factors in the target area. (2) Fuzzy similarity models to determine the native plant species and metal-tolerant plants. (3) A case-based and rule-based model to select the most appropriate reclamation schemes based on the similarity in the physical, chemical, and biological growth conditions. The models are developed in an integrated GIS. All these models are integrated in the SDSS which is able to provide information concerning the recommended reclamation technologies for each case.

In this session, you will learn invaluable capabilities of GIS-based technologies; better understand the importance of not only managing your data but using your data for the purpose of problem solving; and review the modeling and analysis potential of GIS.

Bio: Chad is a certified Senior GIS Professional specializing in providing GIS-based business solutions to his clients. With extensive experience in a vast variety of sectors and industries, he has been providing a broad range of GIS services and solutions for nearly 10 years. Chad specializes in high-end customized spatial problem solving analysis and modeling as well as best practice processes and standards.

Mr. Amirault was previously the Service Director for Information Management for a large environmental consulting company before furthering with experience with an Alberta based Infrastructure planning company then finally partnering in the establishment of his own company.

Thursday, November 5th / Green Horizons / 9:30 am to 10:00 am

Modern Techniques in Soil Reclamation and Biological Monitoring

Sina Adl, Associate Professor, Dalhousie University

Brief: Techniques with a new DNA procedure, modern statistical tools and soil ecology are used to provide a synthesis of the ecosystem below-ground and above-ground food web that will be transformative to the field.

Abstract: We can monitor bacteria, fungi, protists, nematodes, mites, collembolan, spiders, mycorrhizae, plants, to complement soil chemistry and physical tests to understand soil functioning. In response to reclamation treatment we can monitor the recovery of the biodiversity. Recovery of the soil diversity is a prerequisite for soil nutrient cycling to sustain plant roots. We use this information to synthesize the food web function. We can identify missing functional groups, and make predictions of the recovery trajectory and recommendations for amendment. Identification of the biodiversity is by microscopy or using modern DNA sequencing procedures. Statistical analysis of the information uses standard indices for biological diversity, software for various multivariate statistical techniques, and food web modeling software. We will provide examples of the kind of information that can be obtained about the biological system, its state of recovery, and over what time frame. These procedures are probably cheaper, less time consuming, and more informative to soil remediation and recovery of the biological integrity of the system, than traditional soil science techniques on their own.

In this session, you will learn about modern soil sampling for biological monitoring of the above-ground and below-ground species; you will learn what modern statistical tools can do to relate this biodiversity to reclamation management; you will learn how we can synthesize this information to understand how the soil, and thus the vegetation, is responding to treatment.

Bio: Professor S. Adl PhD (Univ. BC, 1998), also trained at the University of Paris VI and Paris XI, and specialized in soil ecology at the Institute of Ecology, University of Georgia. He has authored one text book in soil ecology, and has worked with soils from the arctic, sub-arctic, temperate, sub-tropical, and desert environments. His research has involved forests, pastures, organic agriculture, no-tillage agriculture, mine reclamation, and municipal solid waste composting. He is known for his research in synthesizing soil chemistry, with land management and soil ecology into a wholistic understanding of the system. He has been on the executive of many professional societies, and on the board of reviewers of several professional journals. Recently he was an invited speaker at the Soil Ecology Society conference in 2009, as well as a plenary speaker at the International Congress of Protistology in Brazil in 2009

Thursday, November 5th / Green Horizons / 10:00 am to 10:30 am

Phyto-genetics: Seaweed Extracts as Modulators of Gene Expression to Improve Stress Tolerance and Plant Productivity

Dr. Balakrishman Prithiviraj, Department of Plant and Animal Sciences, Nova Scotia Agricultural College

Brief: Seaweed extract to improve plant growth and productivity under abiotic stress conditions. The molecular mechanism of action of seaweed extract on plant is largely unknown. Recent understanding in this area will be discussed.

Abstract: Extracts of the brown macroalga, *Ascophyllum nodosum*, have been used widely as foliar and soil fertigation on field and horticultural crops for over a century. *A. nodosum* extracts improve plant growth, yield, and quality of plant produce and alleviates abiotic stresses such as salinity and water stress. Although these effects have been documented, the biochemical and molecular mechanisms of action are largely unknown. Recent studies using the model plant *Arabidopsis thaliana* have revealed that the extracts affect specific subset of plant genes at the transcriptional level leading to the biostimulatory and stress alleviating effects. The data further suggest the biological effect of the seaweed extract traverse beyond serving as a source of major and minor elemental nutrient supplements. This research opens up a novel area of chemical regulation of gene expression to improve plant growth and stress tolerance. This potential will be discussed.

Bio: Dr. Balakrishnan Prithiviraj Ph.D. is a Plant Stress Physiology Research Chair at the Nova Scotia Agricultural College, Truro, NS. He has a wide range of experience in plant physiology, post-harvest biology and plant-microbe interactions. Dr. Prithiviraj has worked closely with an Agri-input industries and developed technologies to improve plant productivity that resulted in four patents. He has published 73 peer reviewed scientific papers.

Thursday, November 5th / Green Horizons / 11:00 am to 11:30 am

Coal Mine Rehabilitation – The France Experience

Michel Poirier, Remediation Engineer, Stewardship Branch, New Brunswick Department of Environment, Fredericton, NB

Brief: Awareness of leading edge rehabilitation work in inactive coal mines that can be applicable to Canadian sites; Opportunity to develop sites that can provide numerous benefits to communities after mines are shut down

Abstract: Numerous inactive coal mines in the northern provinces of Le Nord and Pas de Calais, France have been transformed into ecotourism destinations. These sites have had extensive rehabilitation work done that includes such progressive initiatives like creating natural habitats for wildlife and several species at risk, developing nature interpretation and education facilities, creating beaches, lagoons and headponds used to supply potable water and irrigation to agriculture based communities, increasing the sewage treatment capacity of communities, converting idle mining lands to community pastures, utilizing controlled grazing to maintain sites in early succession stages, and developing biking and walking trails. Once developed, these sites are

turned over to the local municipalities to operate, maintain and manage. This initiative is part of a national and European Union vision that equates developing these areas in order to promote local economies, encourage people to become more active in nature and improve the health of citizens, developing a sense of land stewardship and conservation ethic in the population, and re-establishing natural areas in a region that has been heavily industrialized for centuries.

Bio: Michel Poirier is from northern New Brunswick and in 1998, received his bachelor degree in Civil Engineering from the Université de Moncton. In 2002, Michel obtained his professional engineer designation which has facilitated his management of hundreds of contaminated sites with the New Brunswick Department of Environment for the past 8 years. Michel was an environmental inspector in the Bathurst regional office for 3 years and since 2003, is a remediation engineer with the Department's central office in Fredericton. He is an active member of the Atlantic PIRI Committee working to harmonize Atlantic RBCA within the Atlantic Provinces. He is also working closely with his peers to advance the remediation program and to implement a brownfields redevelopment strategy in New Brunswick.

Thursday, November 5th / Green Horizons / 11:30 am to 12:00 pm

Biomimicry and Phytoremediation in Remediation/Restoration/Reclamation of contaminated/toxic sites

Larry Bell, CEO, W.A.T.E.R. Research Associates Inc.

Brief: Utilization of Mother Nature's capabilities in an enhanced or bio-engineered fashion to effect restoration and reclamation of soils, waterways and wetlands.

Abstract: For millennia the natural balance of the world's various ecosystems have had to deal with the development, deposition or exposure of contaminants resulting in toxic sites. Ecosystems have evolved to cap, neutralize, or decontaminate these toxic elements and re-establish a balanced ecosystem. Since the Industrial Age, man has been accelerating the occurrences of toxic elements and site depositions. Generally, it is only in the past century that the intensity and toxicity of these occurrences have been recognized as a danger to ecosystems and resident species (including humans). Ultimately this will result in a reduction of the land's productive capacity for human and species use, or in worst cases, significant health problems, both short and long term. Biomimicry and Phytoremediation are relatively young sciences. Through the judicious use of a variety of indigenous, plants and microbes, just about any toxic element can be broken down, absorbed, or otherwise destroyed. These species often exist in local wetlands or riparian zones, so are well adapted for use on any type of local water body or wetland and are readily available. There are many economic and logistical advantages to utilizing this approach. There is no need for expensive engineered systems; work can be carried out by untrained personnel (labourers) with one experienced supervisor. Logistical access does not have to be created, causing further damage. Most importantly, the task can be completed in one season right from remediation through reclamation. One case study will be presented on a 35 acre, urban lake that has been destroyed in the past 30 years due to subdivision development and will continue as a dead lake, highly contaminated due to some 50 storm water outfalls now flowing into the lake. Historically this lake has been an important community recreational resource. Many contaminated/toxic sites are currently approached with highly engineered technical/chemical/physical methods. These are very expensive and usually involve the introduction of high concentrations of less toxic elements. When the original toxic elements are reduced, neutralized or molecularly modified, the site then still has to be restored with the hope of

recreating some type of man-made limited ecosystem. Utilizing existing ecosystem knowledge of botanical and microbial elements can accomplish the same end result. In this presentation, we will discuss what can we learn from Mother Nature to rebalance disturbed or contaminated ecosystems; how these processes can be harnessed, assisted and accelerated; and the values and economics of Biomimicry and Phytoremediation.

Bio: Larry was educated in Marine Science and Freshwater Ecology at the University of Guelph. He has only worked for his own companies of teams of scientists and marine engineers for the past 40 years. Clients covered a full range of governments, private corporations and universities. Early portion of career entailed significant underwater investigative techniques and projects, with emphasis on winter and Arctic ecosystems and the use of underwater habitats. Over the years he and his companies, working within collaborative teams, have been involved in most ecosystems in the world with the exception of the Antarctic. The past 15 years have been focused on putting multi-disciplined teams together to take on international projects in developing countries. Currently he is developing capabilities to process wastewater and decontaminate soil and water, utilizing phyto-remediation and biomimicry techniques for broad applications in both developed and developing countries.

Thursday, November 5th / Green Horizons / 12:00 pm to 12:30 pm

Erosion Control: Specific Flexible Reinforced Matrix Products and Case Study Exploration in Atlantic Canada

Dave Keays, President, East Way Erosion Control Products

Brief: Specific FRM (Flexible Reinforced Matrix) products and successful case study exploration within the Atlantic Market as it pertains to land reclamation.

Abstract: The revegetation of land reclamation sites in Canada and specifically Eastern Canada provide difficult challenges towards revegetation of the remediated site. The speaker will provide detailed insight into several innovative and successful products used to stabilize erosion control through hydro mulching techniques recently introduced to Atlantic Canada. The case studies reviewed will include before site photos, application techniques and the successful revegetation of several unique and challenging sites. In this session you will learn about several new soil erosion products and the techniques used to successfully create vegetation establishment unlike no results achieved up until the present. Seed, Fertilizer nutrition, Hydromulchers and Hydro mulch will be addressed in this concise power point presentation. Included will be Devco Victoria Junction drain refit, Certain Teed Drywall Ltd. drain reconstruction, Guysborough Landfill site and NB DOT RTE 114 Reconstruction. Products to be presented are FRM Flexterra, Interruption device Terra Tube and The Green Armor system.

Bio: Dave Keays for the last six years has successfully founded and managed operations at East Way Erosion Control Products in Atlantic Canada. Dave is a graduate of the University of Guelph undergraduate program in 1976 with a Bsc. Agr., with a specialty in Environmental Horticulture. Throughout his career Dave has worked with the disciplines of Agriculture while staying focused on Horticulture and recently Horticulture as it pertains to land reclamation. Dave has successfully managed national and regional portfolios for BASF Canada Inc., Canada Packers Shur Gain Division and Pickseed Canada Inc.

BREAK-OUT SESSIONS

Thursday, November 5th / Soil Breakout Session / 1:30 pm to 2:30 pm

Environmental Chemistry Made Easy: A New Perspective on Water, Contaminant Solubility, Sorption, and Innovative Techniques to Enhanced In-situ and Ex-situ Remediation

George A. Ivey, B.Sc., CES, CESA, P.Chem., President and Senior Remediation Specialist, Ivey International Inc.

Abstract: This short course will introduce attendees to a new and easy to use set of principles regarding soil and groundwater contamination not taught in High School or Universities This is achieved though a visually driven and interactive hands-on presentation approach in which attendees learn: water is not H₂O, what really affects contaminant solubility, and the important role of contaminant sorption (i.e., absorption and adsorption) in soil, sediments, and groundwater characterization and remediation.

Attendees with limited chemistry, biochemistry, and/or microbiology experience will lean a new 'easy to use' set of principles to accurately predict the behavior of most LNAPL and DNAPL contaminants in soil, sediments, and groundwater, include their water solubility, sorption potential, how to improve their physical and chemical availability for in-situ and ex-situ remediation at most sites.

The presentation will challenge conventional understandings (Models) of what water and organic contaminants are, and provide three simple tools to predict their behavior in water, with each other, and with soils and bedrock. In doing so, this simplifies many contaminant hydrogeology principles through better understanding why some contaminants dissolve in water while others do not, and why some absorb or adsorb to soil while others do not, why some are less 'bio-available' or less 'chemically-available' while others are not. Attendees will leave the workshop with an applied ability to predict most contaminant behavior as it pertains to site investigation and site remediation action plans.

Over the course of the presentation attendees also learn the #1 factor limiting the effectiveness of all soil and ground water physical, chemical and biological remediation technologies. They will also learn about the use of a new class of surfactants in remediation, surfactant types, their selection, application pros and cons, and how they can serve as an innovative tool in their soil and groundwater bioremediation toolbox. Course handouts, case studies and related reference material are also provided.

Bio: Mr. Ivey is the President and Senior Remediation Specialist with Ivey International Inc. He has over twenty years of environmental experience, and has worked on more than 1200 projects worldwide. His background includes: Organic Chemistry, Geological Engineering, and a Master's Certification in Project Management. He holds several international patents; continues to conduct applied soil, solid waste, waste water, and groundwater research, and is currently working on several remediation projects around the world. Among some of his more recent accomplishments include his being awarded:

- The 2007 Environmental Business Journal Achievement Award: Bronze Medal, February 20, 2008;

- The 2006 North American Frost & Sullivan Award for Technology Innovation, February 7, 2007;
- The 2006 Environmental Business Journal Remediation Technology Merit Award, February 28, 2007;
- The 2006 Globe Award for Environmental Innovation & Application, on March 31, 2006.

Thursday, November 5th / Soil Breakout Session / 2:30 pm to 3:15 pm

Petroleum Hydrocarbon Fingerprinting and Weathering Chronology

Marcus Maguire, Senior Vice President Environmental, AGAT Laboratories

The field of Environmental Forensics, though still relatively new, has matured appreciably in recent years. In this presentation, AGAT reviews Environmental Forensic techniques that help determine the release time, source and type of contamination in the environment.

These techniques range from the routine to cutting edge technology in use and being developed to move this exciting field forward.

Thursday, November 5th / Stream Restoration/Wetlands Breakout Session /

1:30 pm to 3:15 pm

Drafting a New Wetland Conservation Policy for Nova Scotia – Consultation Workshop

John Brazner, Wetland/Water Specialist, Nova Scotia Environment

The *Nova Scotia Wetland Conservation Policy* provides direction and a framework for the conservation of wetlands. It supplements and provides context to legislation, regulations and operational policies designed to protect and guide management of wetlands in Nova Scotia. It is a comprehensive policy for the Government of Nova Scotia to ensure the benefits wetlands provide are maintained for the people of Nova Scotia. The policy highlights the important roles wetlands play in Nova Scotia's landscapes and their value to society. It represents a commitment to managing Nova Scotia's wetlands in a consistent manner and to balance the desire for maintaining a high level of wetland integrity for future generations with the current need for sustainable economic development in our communities.

The specific objectives and provisions designed to prevent the net loss of wetlands contained in the current draft will be presented with the intent of generating feedback that can be used to shape the final version of the policy. This workshop will take a closer look at the draft policy and get your detailed input on the final revisions to the policy. Input will be requested pertaining to perceived effectiveness of the policy, adequate scope and application, support for increased protection of the most significant wetlands, effective strategies for wetland conservation, coordinated approaches with other Maritime provinces, and other related topics.