

# OCETA ANNUAL REPORT





### OCETA'S MANDATE

OCETA, a not-for-profit corporation, maintains its public policy mandate of providing business services, including environmental technology verification to entrepreneurs, start-up companies, and small to medium-sized enterprises (SMEs), to assist the process of commercializing new environmental technologies.

OCETA is also committed to the delivery of programs to promote the adoption of Sustainable Development and Pollution Prevention practices by Canadian SME manufacturers. These core activities provide substantial environmental benefits, strengthen Canada's manufacturing industry, and help create demand for environmental goods and services.

## OCETA BUSINESS ACTIVITIES

### Environmental Technology Commercialization Services

The provision of business consulting services to support the commercialization of environmental research and new environmental technologies remains an important part of OCETA's mandate. Services include assisting SMEs to access government and private funding, business plan preparation, market research, and facilitating linkage to support networks and partnerships.

Environment Canada provides funding support of \$400K per annum, emphasizing new technologies that help meet core responsibilities in CEPA toxics, Clean Air, Climate Change and Clean Water.

### Environmental Sustainability Service Delivery

Achieving a commitment to "Sustainability Practices" by industrial SMEs is a core goal. OCETA acts as a delivery agent for a range of audit based programs that focus on industrial manufacturers in a region or sector where important environmental objectives can be realized. Environmental sustainability creates market demand for good and services, changes investment attitudes, improves environmental performance, while reducing operating costs and enhancing competitive edge.

The redevelopment of brownfield sites and the remediation of contaminated sediments and lands is a critical sustainability issue. OCETA, in partnership with EcoLog Information Resource Group, operates *about*REMEDIATION, Canada's premier website providing information on products and services that help support Canada's environmental industry. The Canadian Brownfields Network (CBN) was created by *about*Remediation and partners to promote knowledge, interest and expertise in brownfields remediation throughout Canada. Support and participation from a broad range of stakeholders has been achieved.

Operated by OCETA, the Ontario Waste Materials Exchange is Canada's only fully automated electronic waste exchange, promoting Sustainability through the 3Rs.

### Environmental Technology Verification (ETV)

OCETA is the licensee of Environment Canada's ETV Program and delivers the program Canada wide. ETV provides SME technology developers with an independent third party means of verifying the performance of environmental technology to a 95% confidence level. Certification assists new technology developers in penetrating the market by providing performance proof to regulators and clients. Canadian International Development Agency (CIDA) provides funding to OCETA to assist the Government of Bangladesh in establishing a national ETV Program that certifies the performance of arsenic removal technologies applicable to rural drinking water sources.

## MESSAGE FROM THE PRESIDENT AND CHAIRMAN OF THE BOARD

### “Message from the Chairman and President”

Ten years old and going strong – the next decade represents a great opportunity to build on past success and expand OCETA’s role in building a Sustainable Future for Canada.

In 1994, the Canadian Government, as part of the Green Industry Strategy, committed \$12 million over four years to create three Canadian Environmental Technology Advancement Centres (CETACs), CETAC-West in Alberta, Enviro-Access in Sherbrooke, Quebec and OCETA located in Toronto. OCETA’s federal funding was matched by the Provincial Government and a productive working relationship was established with the Green Industry Office of the Ministry of Environment. Although committed to a public policy mandate, the organization was challenged to become financially self sufficient within four years at which time funding support was to be sun-setted. The Board of Directors and the management recognized that it would be a major challenge determining how OCETA could retain its public policy mandate without simply reverting to a private sector consultancy model. The year 2004 was our tenth anniversary as an organization, some six years after the sun-setting of the original \$2 million per annum funding. OCETA has achieved financial sustainability with consolidated revenues in the range of \$4 million while generating a net surplus. The surplus contributes to the building of financial reserves and strengthened the balance sheet and positions OCETA in a favorable position entering its next decade.

During the 10<sup>th</sup> Anniversary year a number of important strategic and business successes were achieved which will contribute to the future strength and growth of OCETA. The past decade saw OCETA staff resources grow to approximately thirty full time employees in four office locations, Toronto, Guelph, Burlington and overseas in Dhaka, Bangladesh. The decision was made to consolidate all the Canadian operations in a single location, and in July 2004 the new OCETA head office was opened in Sheridan Research Park, Mississauga. The office provides capacity for growth, and synergy between staff enhances our productivity and effectiveness. As part of this process of consolidation, the Board of Directors passed a resolution that ETV Canada and OCETA should be merged to create a single not-for-profit company and, with the cooperation of the Government of Canada, this should be completed by March 2006.

The Board of Directors would like to express their satisfaction with the results achieved by managers and staff during the past year. Additionally, the company has reached its tenth anniversary with established business segments that support the agreed corporate mandate and provide a revenue base that will allow for future growth. OCETA has succeeded in building an organization that can play an important role for Canada in furthering the goal of environmental sustainability through a strong and viable environmental industry.

A number of changes and appointments were made to OCETA’s Board during the year. Steve Moran CEO of CresTech, and Mike Murray of the Region of Waterloo resigned their positions. New members appointed in 2005 include Brian Denny, Chief Administrative Officer of The Toronto Region Conservation Authority (TRCA), Robert Kerr, Managing Director of International Council for Local Environmental Initiatives (ICLEI) World Services, Richard Morris, Managing Partner of the Better Buildings Partnership and Manager of the City of Toronto’s Energy Efficiency Office, Harry Dahme, Senior Partner, of Gowlings LaFleur Henderson LLP, Environmental Law Group, and Dan McGillivray, Managing Director Earth Environmental Technologies (ETech), Ontario Centres of Excellence (OCE).

## TECHNOLOGY COMMERCIALIZATION SERVICES

For over ten years OCETA has provided a comprehensive range of technical and business services to Ontario SME clients. These companies have been leaders in innovation and technology development and OCETA has provided valuable assistance with a variety of business and financial services. OCETA continues to work with existing clients on fresh initiatives as well as introducing many new SMEs to its services.

**Encelium Technologies Inc.** markets an advanced lighting control and energy management system that will reduce lighting related energy consumption by an estimated 60 per cent and will reduce lighting related energy demand by an estimated 40 per cent. The system is primarily sold to commercial building owners, system specifiers, property developers, property managers, and tenants. OCETA assisted Encelium in marketing their technology and accessing key decision-makers for Canadian properties and buildings with emphasis on the public sector. One such project was a retrofit within the University Health Network in Toronto.

### TechInt Goodfellow Technologies



TechInt Goodfellow Technologies is marketing the EFSOP<sup>®</sup> product (Expert Furnace System Optimization Process). This is a sophisticated system to measure off-gas composition from industrial processes and employs continuous fume analysis, flow and temperature measurements along with real-time process data, to optimize combustion and to control post-combustion systems. OCETA has previously produced a Technology Profile on EFSOP<sup>®</sup> use in the steel sector for electric arc furnaces and ETV Canada has undertaken a detailed evaluation of the process and issued a performance claim verification certificate. OCETA is now partnering with TechInt, Unisearch and the University of Toronto in an SDTC project for new applications such as coal fired power generation and cement production.

**Blue-Zone Technologies Ltd.** specializes in cost effective pollution prevention from hospital operating room air emissions. The company's market niche is a sustainable capture of currently used inhalation anesthetic agents and aggressive greenhouse gases routinely discharged into the atmosphere through the operating room scavenging system. OCETA has worked with Blue-Zone for a number of years and assisted the company in successfully applying to SDTC for technology demonstration funding. This project started in earnest in 2004. OCETA is now assisting Blue-Zone to market the system to the Ontario Hospital Association and other relevant medical and environmental funding organizations. The aim is to make Deltasorb the de facto choice for hospitals in this area.

### Nexstar



Nexstar Lighting Limited's Starburst Luminaire, based on higher-intensity fluorescent fixtures, is a potential replacement for High-intensity discharge (HID) lamps in high-bay applications. HID light sources, such as metal halide and high-pressure sodium lamps, have long dominated the market for lighting indoor spaces with high ceilings. These 'high bay' spaces are typically found in factories, warehouses, athletic facilities and large retail stores.

Nexstar has installed two high bay applications in the Greater Toronto Area. In both cases, the company was contracted to provide an energy efficient lighting solution for specific areas of a plant. Both clients required a solution that would provide equal to, or higher, light levels than the existing metal halide fixtures and they also needed to be more energy efficient. These installations have been very successful from both lighting quality and energy efficient standpoints. OCETA worked with Nexstar to prepare a Technology Profile and to summarize the energy and GHG savings.

**The Ontario Centre for Ecology (ONCFEC) Inc.** has developed a novel in-stream pollution removal technology for pollutants derived from non-point (unregulated) sources. The technology is based on the natural capacity of streams to restore themselves from pollutants, by utilizing a complex of biological, physical and chemical self-purification processes. If a stream doesn't have some of these conditions, the necessary complex could be created artificially. As a result, a wider spectrum of pollutants, including organic and inorganic polluting particles, and also pathogens could be eliminated from the entire water body as well as from the benthic soil. Once formed, the froth is collected using a boom system and can then be removed and treated appropriately.



OCETA is assisting ONCFEC look for a partner to cooperate with implementing and marketing the developed technology. Remediation and emergency spill response companies should have an interest in this system, especially when they are working in sensitive watersheds.

### SME Support Bylines

OCETA has been working with a number of new SMEs in Ontario to help with technology commercialization:

**Evergreen Energy, St Thomas**, is developing a gasification technology to then undertake energy from waste projects in the agricultural sector.

**Claire Lasers, Kitchener**, is designing novel UV laser systems and has a new concept to use lasers, instead of UV lamps, for water disinfection.

**Canentec, Thornhill**, is working in the area of biodiesel technology and, in addition to being the representative for an Austrian company for a commercial system, is developing a biodiesel reactor for the small farm/horticultural market.

**Adventis, Oakville** is designing and building a small-scale hydrogen generation and storage system for industrial or transportation applications.

**EcoServices, Waterloo**, has a new mosquito capture system for catch basins that will reduce the need for larvicide usage in municipalities.

**Macro Systems Packaging, Barrie**, has a novel packaging system for the food and beverage sector which will significantly reduce the use of corrugated cardboard.

**ReGen Energy, Toronto**, is developing a new method of regulating electrical peak demand in commercial and institutional buildings

**Cleanfield Energy, Hamilton**, has a new vertical axis wind turbine design that can be used on building roof tops and in rural areas.

**Marnoch Thermal Systems, Markham**, is developing a supplemental co-generation system for alternate energy technologies, particularly solar thermal.

### SUSTAINABILITY

OCETA is the Delivery Agent for several programs that promote the adoption of sustainable development and pollution prevention practices by SME businesses and industrial manufacturing operations.

Each program is comprised of site-specific audit of manufacturing operations by a third party technical consultant; financial incentive to share a minimum of fifty percent of the audit cost; customized audit scope to ensure company needs and program objectives are met; action oriented “how to” report to implement opportunities; strategic alliances with trusted business networks to gain access to SMEs; and dedicated program management by OCETA.

Industrial SMEs have implemented permanent process and behavior changes resulting in GHG emission reductions; reduction of CEPA toxics and hazardous wastes; protection of water resources; pollution prevention planning; spill prevention and emergency response; and adoption of environmental management systems. Collectively, OCETA’s sustainable development programs have resulted in substantial economic benefits in terms of cost savings to participating companies; growth of the environmental goods and services industry; generating revenue to Ontario consulting firms and to Canadian environmental industry from capital investment opportunities identified in the audits.

## INDUSTRIAL ENERGY AUDIT INCENTIVE

Natural Resources Canada (NRCan) through its Office of Energy Efficiency has been partnering with industry for more than 25 years to promote energy efficient industrial practices through the Canadian Industry Program for Energy Conservation (CIPEC). Building on this successful partnership and the federal government's commitment to address climate change issues, NRCan has introduced a Canada-wide Industrial Energy Audit Incentive program to assist companies in identifying ways to increase energy efficiency, improve production processes and cut costs. The program operates until March 31, 2006.



Under this program, NRCan is providing a financial incentive to companies to offset their cost of hiring a contractor to conduct an energy audit of their manufacturing facility. NRCan's audit incentive will cover 50% of the energy audit cost, to a maximum of \$5,000. When applying for the incentive, companies must complete NRCan's Industrial Energy Audit Incentive Application and Contribution Agreement form. The energy audit incentive is only available to companies registered with NRCan as Industrial Energy Innovators.

The Ontario Centre for Environmental Technology Advancement (OCETA) has been contracted by NRCan to assist in the marketing and delivery of the energy audit incentive program across Canada (excluding Quebec and the upstream oil and gas sector in Western Canada).

### Regional Workshops

OCETA has successfully delivered 14 energy information sessions and workshops across Canada on behalf of NRCan. These have been an effective tool to educate manufacturing companies on the economic benefits and business-case of energy efficiency, and to raise awareness on the range of industrial energy services offered by NRCan. Representatives from some 1,000 industrial manufacturing plants, energy service contractors, utilities and other organizations have attended and benefited from the hands-on information exchange and networking opportunities. Additional sessions are planned for the coming fiscal year.

### Case Study

Hershey Foods Corporation is North America's largest manufacturer of quality chocolate and non-chocolate confectionary products. The company operates their Canadian plant in Smiths Falls, Ontario and employs 600 people. The plant produces more than 100 million pounds of product per year. Total annual energy costs are in the



\$6 million range, with about 60 percent of the total for electricity and 40 percent for natural gas.

Hershey Canada participated in the Industrial Energy Audit Incentive Program operated by Natural Resources Canada. A third party engineering consultant was retained to undertake utility distribution and mapping of the major energy consuming systems in the plant. These included 150 psig steam distribution, 30 psig steam distribution, process hot water, cooling tower water, and compressed air. The resultant quantification of these systems provided Hershey with a detailed understanding of where and how energy is used, to allow for subsequent evaluation of energy saving opportunities.

To date Hershey has implemented one major project, with plans to implement three other recommendations. According to Gil Stewart, Facility Manager at the Smiths Falls plant, "when we first started our energy efficiency program, we lacked direction and focus. Today, we know our potential savings and we have a plan on how to achieve them." Hershey has also benefited from their participation in the Steam Saver Program operated by Enbridge Gas Distribution Inc. Several energy efficiency opportunities have been identified to reduce natural gas consumption including heat recovery, utilization of biogas and a steam turbine installation.



## TORONTO REGION SUSTAINABILITY PROGRAM

The Toronto Region Sustainability Program (TRSP) provides small to medium-sized manufacturing enterprises (SMEs) in the Greater Toronto Area (GTA) with one-stop pollution prevention (P2) technical assistance, coupled with a financial incentive to conduct a P2 Assessment and develop a P2 Action Plan to address priority pollutants and wastes (i.e. smog precursors – volatile organic compounds (VOCs) and fine particulate matter, greenhouse gas (GHG) emissions, toxic releases to the air and sewers, and hazardous wastes) targeted by three orders of government.



Program and funding support is provided from Environment Canada, the Toronto and Region Conservation Authority (TRCA), the Ontario Ministry of the Environment (MOE), and the City of Vaughan (Vaughan Manufacturers Sustainability Program). An additional program component, the Ontario Trillium Foundation-funded York Region Sustainability Program, includes public education and outreach activities across York Region communities.



### Technical Assistance and Funding Incentive

- Manufacturers with fewer than 500 employees at any one facility are eligible to have a multi-media P2 Assessment undertaken by a pre-qualified P2 consultant from OCETA's roster.
- Participants receive a funding incentive of up to 50 per cent (maximum \$4,000) in supporting the costs of a typical \$ 8,000 P2 Assessment. The consultant, in concert with facility staff, will identify the root causes of priority pollutants and wastes, and recommend technology, process and operating practice improvements for the facility. Client confidentiality is maintained.



### Program Benefits and Results

A wide array of industrial clients have benefited from undertaking a P2 Assessment through the program including those from the Aluminum re-melting, Auto Parts, Chemical, Electronics, Food Processing Metal Finishing, Packaging, Paint Manufacturing, Paint Stripping, and Printing sectors.

Over 90% of program clients are implementing all or most of the P2 projects identified through their P2 Assessments. Program clients have found that the P2 Assessment and the resulting P2 Action Plan leads to improved environmental performance as well as enhanced business bottom line in the form of cost savings, reduced liability, and better marketing opportunities. Overall, TRSP clients have realized a significant return on investment through implementation of the P2 opportunities, with an average payback of less than one year.

Success Stories

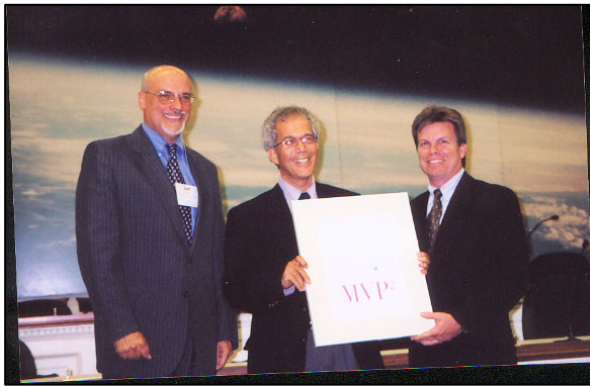


*Informco – Canadian Council of Ministers' of the Environment (CCME) P2 Awards – Medium Sized Business (2003)*

In 2003, the CCME awarded its 6th annual Pollution Prevention Award in the medium business category to Informco Inc. of Scarborough, Ontario. As part of Informco's environmental initiative, this graphic solutions and lithographic printing company, identified pollution prevention opportunities and improved practices to achieve and realize these opportunities. One of Informco's major sources of pollution came from use of large quantities of isopropyl alcohol (IPA), a volatile organic compound and smog precursor used to stabilize the conductivity and surface tension of municipal water used in the printing process. Other pollution issues included open drums of solvent blanket wash and IPA allowing fugitive emissions.

To address the problem, Informco installed a reverse osmosis system to treat the feed water. Informco now runs IPA free, which removes 4000 kg / 4 tonnes of VOC emissions per year from the environment. Along with the significant environmental benefits, the risk of fire was reduced and air quality was improved. Also, the company adopted non-VOC based additives for its printing press fountain solutions and enforced a closed container policy that allowed for a 14% reduction in VOC emissions. Sandy Stephens, Informco's VP of Operations is sold on pollution prevention, "You can measure the positive effects on the bottom line and in many less tangible ways. By taking a holistic approach, which includes treating your staff and the environment with respect, it pays in loyalty, good morale, constant improvement and reduced liability fears."

OCETA – US Pollution Prevention Roundtable MVP2 Award (2003)



The Toronto Region Sustainability Program was honoured with an MVP2 Award by the US Pollution Prevention Roundtable on September 17, 2003, in Washington D.C. The MVP2 Awards are presented to federal, state and local government agencies, as well as non-profit organizations and industry entities, which have demonstrated significant achievements in pollution prevention. OCETA was the first non-US based organization to win the award.

OCETA also received an *Honourable Mention* by the Canadian Council of Ministers of Environment (CCME) in showing leadership in the area of pollution prevention, at the eighth annual CCME Pollution Prevention Awards held

in Victoria, British Columbia, June 1, 2005, in the Organization/Institution/Group Category.

**Hospital for Sick Children - CCME P2 Awards – Institution (2004)**



In 2004, the Hospital for Sick Children (Toronto) received the Institution Award at the 7th Annual Pollution Prevention Awards ceremony. The hospital's comprehensive P2 plan goes beyond the City's Sewer Bylaw P2 requirements. They eliminated 2.5 kg of mercury and 1,700,000 kg of CO<sub>2</sub>, recycled diverted solid waste from landfills, conserved 1,434,000 kWh of energy per year, conserved 67,000 cubic metres of water per year and improved worker health and safety.

This was the first multimedia pollution prevention plan for a hospital in Canada that comprehensively and systematically addressed the underlying causes of all waste streams, emissions, and discharges. Tom Meevis, Environmental Affairs Coordinator stated, when accepting the award: "this (P2) plan provides us with an excellent starting point moving forward in pollution prevention."

**Trimac Transportation, Oakville Washrack Cleaning Facility – CCME P2 Awards - Small Business Honourable Mention (2005)**



In 2005, Trimac received honourable mention in the Small Business Category at the CCME P2 Awards. This bulk trucking company eliminated the use of solvents in their exterior cleaning process by using a soluble media blasting technique with baking soda. The technique eliminates over 24 tonnes per year of methylene chloride. The return of investment was only two and half months as the cost to treat the pollutants would have added \$162,000 per year to in-plant measures.

## BUSINESS AIR QUALITY PROGRAM

Environment Canada, Ontario Region has developed the Canada- US Border Air Quality Strategy to increase bi-national cooperation on air quality. One component of the Border Air Quality Strategy is the Great Lakes Basin Air shed Management Framework pilot project, which focuses on Southwestern Ontario and Southeast Michigan.



In support of this pilot project, Environment Canada has developed a Business Air Quality Program Pilot to reduce criteria air pollutants generated by small- to – medium sized (SME) industrial manufacturing operations in Southwestern Ontario. The program targets reduction of air emissions of NO<sub>x</sub>, SO<sub>2</sub>, volatile organic compounds (VOCs) and particulate matter. OCETA is the delivery agent for the pilot that runs over 18 months to March 31, 2006.

### The main features of the BAQP pilot are:

- The program is voluntary for companies to participate. Companies that are driven to perform beyond compliance and are sensitive to their environmental performance are the most likely candidates.
- A site specific facility assessment by qualified consultants is done at a manufacturing site. The program provides an incentive of 50% of the cost of the assessment, to a maximum of \$5000. OCETA assists companies in securing all available additional funding from complimentary programs from government and utilities that may be relevant.
- Client confidentiality is maintained.

Marketing of the pilot program has been actively directed by Environment Canada. The message is strongly driven by an air emission reduction benefit. It will be part of the pilot project evaluation to determine how well this message resonates with SME management versus issues that are of concern to them, and if this marketing generates strong participation.

## BUSINESS WATER QUALITY PROGRAM



**The Regional Municipality of Waterloo (RMOW)** is dependant upon local groundwater wells and the Grand River for their water supply. To protect these water resources, the RMOW in consultation with a group of local stakeholders and OCETA, developed the Business Water Quality Program (BWQP) to prevent spills to groundwater, surface water and sewers. The BWQP was launched in June 2001 as a five year program and finished in 2005. The BWQP is funded by RMOW, with support from Environment Canada, Ontario Region.



**Environment  
Canada**    **Environnement  
Canada**



**The BWQP provided grants to Region businesses** to share the cost of a professional facility review and assessment (FRA) and implementation of best management practices (BMPs). The FRA provided an inventory of chemical substances; identified risk areas and potential for spills; reviewed pollution prevention plans; and identified opportunities to implement BMPs. As delivery agent, OCETA assists businesses throughout the BWQP process.

**Increasing awareness** of water protection issues is a key objective of BWQP. Through intensive marketing and face-to-face interactions with businesses, awareness of spill prevention has increased within the local business community. Companies were presented with opportunities for improvement and employees gain skills and knowledge to enhance their job performance when BWQP participants implement recommended training programs. In addition, OCETA delivered RMOW-sponsored workshops to help businesses reduce the risk of a spill.

### **Program Results and Successes to Date**

- 50 facilities from 24 business sectors requested proposals and participated in the program
- Total business investment: \$398K
- Total BWQP grant support committed to businesses: \$250K
- Over 340 P2 opportunities identified

An in-depth analysis of program performance revealed that BWQP successfully reached the target audience; most participants were SMEs whose activities present a moderate/high risk to groundwater. Additional BWQP achievements included reductions in CEPA toxics, development of employee training programs, increased spill response ability, and improvements to sewers, drains and secondary containment structures.

**Case Study**



The Cambridge Ontario facility of Gerdau Ameristeel Corporation has been in business for over three decades and is the largest recycler in Waterloo Region. The Cambridge facility recycles more than 350 metric tons (70 million pounds) of discarded scrap metal into new steel products each year. The mill is a leader in the minimill industry in production, service, and quality, and is registered to both ISO 9001 for quality and ISO 14001 for its Environmental Management System. Gerdau's Cambridge facility completed an FRA by an external consultant, which recommended several projects to reduce the risk of spill. Armed with this information, and a commitment of a \$10,000 grant from BWQP, Gerdau was able to move forward with a project to replace and relocate their above-ground hydraulic

oil storage tanks, including secondary containment and roofing. This project was completed November 2003 and protects against potential environmental contamination and clean-up costs in the event of a spill. Bob Downie, Gerdau's Environmental Coordinator, says "Participating in BWQP was an easy decision. The Program's financial assistance helped us initiate a worthwhile project to reduce our liability while protecting local water resources; it was a win-win situation."



[www.aboutremediation.com](http://www.aboutremediation.com)

**aboutREMEDICATION** is Canada's leading information resource on effective site remediation and sustainable brownfields redevelopment.

### Information and Solutions

aboutREMEDICATION.com (AR) provides industry stakeholders and practitioners with relevant up-to-date news, initiatives, resources, tools, technologies and case studies. Over 88,500 unique visitors per year access the website and obtain information and innovative solutions to guide them through the remediation, reclamation and redevelopment process.

### Key Industry Partners

AR offers unique content through partnerships with government and funding from industry sponsorships and advertising. Stakeholders can collaborate with experts to increase their awareness and knowledge to accelerate site remediation and brownfields redevelopment across Canada.

As a sector gateway to relevant expertise and information on government policies, effective remediation products and services, and successful management strategies, practitioners can promote their services and products to develop new business opportunities in the brownfields industry.

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### Brownfield Redevelopment Toolbox

AR collaborated with the Canadian Brownfields Network to create a Brownfields Redevelopment Toolbox for Ontario Municipalities as a pilot project for Canadian communities.

This free online resource guide assists municipalities in understanding the process of redevelopment and educates them regarding the significant role they play in motivating and championing brownfields redevelopment in their communities.

The three main components of the Toolbox are:

- 10 Key Elements of a Redevelopment Strategy;
- Brownfields Decision Tree which outlines the steps to redevelopment including Community Readiness, Evaluation, Transaction, Implementation and Site Management; and
- 5 Steps to Redevelopment that focuses on the common challenges and issues, and identifies practical tips and solutions to help municipalities address them.

### Toolbox Partners

The project was developed with funding support from Environment Canada (Ontario Region), Industry Canada (FedNor) and the Canada Mortgage and Housing Corporation.

### Ontario Toolbox Funding Organizations



### Ontario Toolbox Development Partners



- Ontario Ministry of Municipal Affairs and Housing
- City of Brantford
- City of Kitchener
- City of Toronto



### **Knowledge and Capacity Building Workshops**

AR collaborates with federal, provincial and municipal governments to develop and deliver Brownfields Knowledge Workshops. The interactive workshops are used to increase awareness regarding the benefits of redevelopment, disseminate information and knowledge, and allow networking and transaction opportunities. The workshops were well received by participants and government-funding agencies.



[www.canadianbrownfieldsnetwork.ca](http://www.canadianbrownfieldsnetwork.ca)

OCETA, Ecolog Information Resources Group, and the Canadian Urban Institute formed the Canadian Brownfields Network in March 2004 in response to the National Roundtable on the Environment and Economy (NRTEE) recommendation to establish a national brownfields network in Canada.

**Vision**

- Advocate brownfields redevelopment as an essential component of sustainable communities and urban revitalization in Canada.

**Mission Statement**

- Act as enabling mechanism to implement the NRTEE’s recommendations for a national brownfields strategy;
- Deliver outreach and capacity-building initiatives to increase awareness on the benefits of brownfields redevelopment;
- Create linkages and connectivity between private industry, government and NGOs;
- Consolidate regional and local issues into an integrated plan for national and provincial action.

**CBN Achievements**

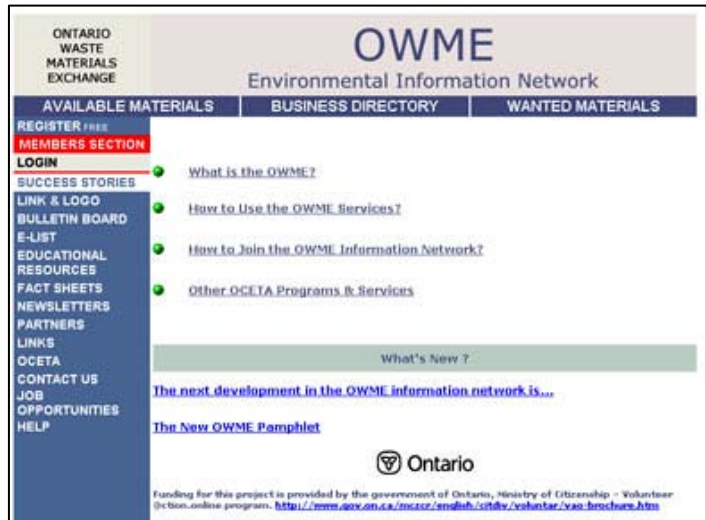
- Formed Advisory Panel of experts that cover the various industry sectors from Canada and internationally;
- Created a membership base of over 200 members, both individual and corporate memberships are available;
- Developed strategic alliances with key support organizations from across Canada and internationally;
- Implemented advocacy, education and outreach activities;
- Organized a workshop with the NRTEE to consider approaches to removing Crown liens and tax arrears on brownfield sites;
- Organized a workshop with the Federation of Canadian Municipalities (FCM) to obtain advice and suggestions from industry stakeholders on the types of loan products that FCM should develop to accelerate the redevelopment of brownfield sites in Canada (\$150 M Green Municipal Fund);
- Worked with AR to develop the Ontario Brownfields Redevelopment Toolbox;
- Organized the CBN’s annual Canadian Brownfields Conference with the Canadian Urban Institute. The conference featured high-profile keynote speakers and seminars, the latest case studies from across Canada and internationally, and the Brownfields marketplace.
- Created the Canadian Brownfields Chronicle, which is a media partnership between the CBN and *HazMat Management* magazine;
- Established credibility and working relations with federal government departments (Infrastructure Canada, Environment Canada).



## ONTARIO WASTE MATERIALS EXCHANGE

The Ontario Waste Materials Exchange (OWME) has been in operation since the mid 1980s. The Exchange has assisted companies in diverting thousands of tonnes of waste materials from landfill. Originally managed by ORTECH, operational responsibility was transferred to the Ontario Centre For Environmental Technology Advancement (OCETA) in December 1997.

The Exchange is a service designed to facilitate the reuse and recycling of industrial by-product materials. The purpose is to create a network that allows waste products or outputs of one industry to become the raw material inputs of another. Through the Exchange network, generators are provided with access to reuse and recycling markets, and users with access to material suppliers.



The Exchange has undergone an electronic evolution. Users simply logon to the website, register and gain instant access to a wealth of information on materials available for exchange and waste diversion opportunities.

### OCETA and the University of Toronto Deliver a Workshop on Environmental Management Systems and Cleaner Production in Cambodia

Since 1999, OCETA has been working with the University of Toronto on the CIDA funded, “Waste-Econ Program: Making Wastes Work for the Economy through Integrated Waste Management in Vietnam, Laos and Cambodia”. On October 26 and 27, 2004, OCETA, in association with the University of Toronto, conducted an Environmental



Training Workshop on Environmental Management Systems and Cleaner Production with Specific Focus on Opportunities for the Textile Industry, at the Royal University of Phnom Penh, Cambodia.

The Royal University of Phnom Penh, the partner organization in Cambodia, had marketed and promoted the workshop to a broad range of stakeholders. The workshop attracted about 30 participants, consisting of representatives from industry, government officials involved in environmental matters and others. OCETA presenters focused on basic elements and benefits of an environmental management system, lessons learned in the development of clean production policies in other countries and special techniques for cleaner production in the textiles industry. In addition to presenters from OCETA and the University of Toronto, a guest presenter from Vietnam discussed his country’s experience to date with cleaner production and both Royal University faculty and industry representatives spoke about the issues facing Cambodian government and industry in this field. A Cambodian participant provided an overview of a cleaner production project being launched in Cambodia by the United Nations Industrial Development Organization (UNIDO). The group discussions were excellent. Towards the conclusion of the workshop, some industry participants informed the workshop that they had formed a special inter-industry group to work to collaborate on the development of environmental management systems for their respective companies.

## ETV CANADA

ETV Canada is the independent verification organization which manages Canada's Environmental Technology Verification Program, under a license agreement with Environment Canada. The ETV Program was developed by the Government of Canada to accelerate the growth of the Canadian environmental industry, and in particular, to promote the commercialization of Canadian innovative environmental technologies. ETV Canada offers a reliable process for verifying the environmental performance claims associated with technologies and technological processes.

*ETV Canada has 3 key areas of activity:*

- Performance Verification
- Performance Benchmarking
- Harmonization and Cooperation



### Performance Verification

Provides independent assessment and verification of environmental performance claims associated with technologies, projects and programs.

*Performance Verification:*

- is based on scientific and statistically valid test methods and verification protocols
- helps qualify available technologies for solving environmental issues
- supports development and implementation of environmentally-sound technologies



All verifications require complete and representative baseline operational data independently prepared by an accredited qualified third party. The technology performance claim must demonstrate environmental benefits and conform with health and safety standards.

To help companies not yet ready to enter the verification process, ETV Canada has developed the Environmental Technology Development Assessment Program (ETDAP).

***ETDAP involves two components:***

*Market Review and Application* – to assess the technology performance requirements needed to meet existing or anticipated regulations and industry standards

*Technology Assessment* – to provide guidance for the generation of sufficient data of adequate scientific and statistical quality, overseen by a qualified independent technical organization.

An ETDAP report also provides an estimate of the cost and time required to achieve ETV verification.

Overall, ETV Canada's efforts in the performance verification area have focused on the establishment of a strong portfolio of technology companies, many of which will be profiled at GLOBE 2006 International Conference and Trade Fair on Business and Environment in Vancouver.

## Performance Benchmarking

Through Performance Benchmarking, ETV Canada helps ensure that the environmental performance of technologies and technology systems is relevant to the marketplace and responsive to user needs.

*Performance Benchmarking:*

- engages key stakeholders to identify sector priorities and performance objectives
- develops performance criteria for implementation options, including technology applications and process modifications
- addresses qualitative and quantitative performance objectives

By working with other organizations and agencies both in Canada and internationally ETV Canada is seeking to promote the adoption and use of environmentally-sound technologies in the global marketplace.

### **Canadian Association of Municipal Fleet Managers (CAMFM)**

ETV Canada is working with CAMFM to establish a comprehensive framework for assessing the performance of green transportation infrastructure based on the integrated evaluation and verification services that ETV Canada can provide.

The objectives of the proposed project are to:

- further characterize the market for green transportation infrastructure;
- establish a comprehensive framework for assessing the performance of green transportation infrastructure; and
- better serve both technology users and suppliers in the transportation infrastructure marketplace leading to greater market confidence and substantial benefits to all stakeholders.

### **City of Toronto – Eco-Efficient Street Sweepers**

ETV Canada has worked with the City of Toronto to assist them in the establishment of a protocol to reduce air toxic and criteria pollutant emissions arising from public and private sweeper fleet operations with a particular focus is on particulate matter (PM-10). The protocol would be used to screen and select more efficient sweepers when purchasing or leasing these vehicles for sweeping operations undertaken by or for governments or governmental agencies.

## Harmonization and Cooperation

By working with other organizations and agencies both in Canada and internationally ETV Canada is seeking to promote the adoption and use of environmentally-sound technologies in the global marketplace.

The third component of the ETV Canada strategy, Harmonization and Cooperation:

- provides a mechanism for inter-jurisdictional reciprocity
- facilitates mutual recognition and accreditation of Verification Entities
- enables the sharing of protocols and test methods
- clarifies the reporting of performance information

To date, specific efforts have focused on the following national governments and international agencies:

- US EPA ETV Program
- European Commission
- European Union Advisory Board for the PROMOTE Consortium Project
- Confederation of Indian Industries (CII)
- World Bank Water and Sanitation Program (WSP)
- UNEP Strategic Plan for Technology Support and Capacity-building
- World Urban Forum

### Case Study

#### City of Toronto Street Sweepers Testing

The City of Toronto and the City of Hamilton urgently need to replace existing street sweepers. \$5 Million worth of new sweepers will be purchased based on this need. Testing of the sweepers needed to be performed to ensure suitability of the sweepers for winter work (where no dust suppressing water spraying would be carried out – as would normally occur in summer). City of Toronto want to be able to use the street sweepers in the City even on smog days, so are interested in locating street sweepers with high efficiency in retention of picked up dust.

The current test method for street sweepers is based on the California protocol 1186. However, dust suppression water spraying is allowed to be used to reduce dust in the 1186 test, and the test material required to be used in the 1186 test is not deemed suitable by City of Toronto for their requirements.



A new test protocol was developed by City of Toronto, and the testing was focused on the efficiency of pick-up from a simulated street of PM 2.5 and PM 10 particulate material laid in a tunnel facility. To gain credibility in testing the methodology ideally needed to be witnessed by third party experts.

ETV Canada located a suitable expert organization, organized initial meetings with City of Toronto, and the ultimate involvement of independent test experts Prairie Agricultural Machinery Institute (PAMI) as witnesses to the testing. ETV Canada also was on site as witnesses to the street sweeper testing.

In the end, one street sweeper technology (regenerative air based) was tested. The testing lasted nearly 2 weeks for the particulate testing a pre test for part of the first week which involved running through the testing method with a street sweeper. This was followed by the full testing the next week of the proponents street sweeper. The testing was completed in September, and the end result of the analysis of the data and additional on street testing will be the decision by City of Toronto and Hamilton whether or not to purchase this particular type of street sweeper.

## **BANGLADESH ENVIRONMENTAL TECHNOLOGY VERIFICATION- SUPPORT TO ARSENIC MITIGATION PROJECT (BETV-SAM)**

### **Addressing the Arsenic Crisis in Bangladesh:**

#### **The ETV-AM Program and BETV-SAM Project**

Tube wells are the main source of clean drinking water in rural Bangladesh. Much of the groundwater supplying those wells is contaminated by very high levels of naturally occurring arsenic, originating in the region's deltaic geology.



Consumption of inorganic arsenic has been linked to health effects such as skin cancer and cancer of internal organs. It is estimated that at least 25 million people in Bangladesh are at risk for arsenic poisoning and there have been thousands of documented cases. The World Health Organization has described this crisis as the largest case of mass poisoning in history.

The *Environmental Technology Verification – Arsenic Mitigation (ETV-AM) Program* and its successor project, the *Bangladesh Environmental Technology Verification-Support to Arsenic Mitigation Project (BETV-SAM)* have been funded by the Canadian International Development Agency. ETV-AM was completed in December 2003 and the successor project, BETV-SAM, began in early 2004.

The main purpose of these two projects has been to verify the performance of technologies that are designed to remove arsenic from well water. The candidate arsenic removal technologies that pass this verification process are issued a certificate that allows them to be sold in Bangladesh.

#### **Project Activities include:**

- Soliciting candidate arsenic removal technologies from around the world.
- Subjecting those technologies to a rigorous and transparent verification process. This includes screening, field testing and then comparing the results of those field tests with the performance claims made by the manufacturers of these technologies.
- Based on the results of the verification work, either accepting or rejecting a candidate technology for use in Bangladesh, through the Bangladesh Council for Scientific and Industrial Development.
- Building the capacity of local institutions to carry out water treatment technology verification on their own.
- Advising the World Bank and other donors on how best to deploy and maintain verified arsenic technologies in regions affected by arsenic contamination.
- Assisting the Government of Bangladesh in developing a regulatory framework for the oversight of these technologies, to ensure safe use by villagers.

**Results to date include:**

The granting of verification certificates to a number of arsenic removal technologies that have successfully passed the verification process. These technologies are now being deployed in Bangladesh, in areas affected by the arsenic contamination.

The development of the scientific protocols needed to test and verify the performance of arsenic removal technologies, under Bangladeshi conditions.





## OTHER PROJECTS

### OCETA Delivers Technical Assistance on Arsenic Contamination of Irrigation Water in the Terai Region of Nepal



Photo by Peter Fowlie

Arsenic contamination from natural sources has been found in irrigation wells drilled in the agricultural Terai region of Southern Nepal. The wells were drilled as part of the Community Groundwater Irrigation Sector Project (CGISP) sponsored by the Asian Development Bank (ADB) and the Canadian International Development Agency (CIDA) to allow farmers in the Terai to reliably plant and harvest crops during the dry season. OCETA has provided technical assistance to CIDA, the ADB and the Government of Nepal to evaluate the extent of arsenic contamination of irrigation water.

The purpose of a 2004 mission to Nepal was to evaluate the scientific basis of the Arsenic Management Strategy developed by the Nepal Arsenic Technical Advisory Committee. The evaluation was carried out by attending a progress review workshop on the CGISP, evaluating the laboratories providing data to the project, use of test kits for field analysis of arsenic, techniques used for sampling water from the wells and considering the implications of CGISP for arsenic in the irrigation wells and their potential impact on drinking water wells used by the farmers.

The Nepal drinking water standard has been set at 50 ppb (0.05 ppm). Nepal does not currently have a standard for irrigation water. It is important to note that the drinking water standard has little relevance to irrigation water. The Canadian Council of Ministers of the Environment (CCME) has established guidelines for arsenic in irrigation water of 100 ppb arsenic. Although not directly applicable in Nepal, the CCME guideline can provide a useful benchmark for CGISP.



Photo by Peter Fowlie

## FINANCIAL

OCETA  
Condensed Consolidated Balance Sheet

As at March 31	2005	2004
<b><u>ASSETS</u></b>		
<b>CURRENT</b>		
Cash and marketable securities	\$ 961,598	\$ 766,735
Accounts receivable (less allowance)	314,652	393,302
Sundry	28,717	14,930
	1,304,967	1,174,967
NON-MARKETABLE SECURITIES	-	7,604
PROJECT DEVELOPMENT COSTS	79,479	106,729
PROPERTY, EQUIPMENT AND INTANGIBLES	145,668	88,014
	\$ 1,530,114	\$ 1,377,314
<b><u>LIABILITIES</u></b>		
<b>CURRENT</b>		
Accounts payable and accrued liabilities	\$ 247,669	\$ 247,729
Deferred revenue	638,942	598,967
Loan payable - current portion	-	6,250
Government contributions payable - current portion	1,000	14,325
Capital lease obligations - current portion	15,876	-
	903,487	867,271
CAPITAL LEASE OBLIGATIONS	23,609	-
GOVERNMENT CONTRIBUTIONS PAYABLE	10,420	30,420
	937,516	897,691
<b><u>NET ASSETS</u></b>		
INVESTED IN PROPERTY AND EQUIPMENT	68,733	50,564
DEFICIENCY IN UNRESTRICTED NET ASSETS	523,865	429,059
	592,598	479,623
	\$ 1,530,114	\$ 1,377,314

**AUDITORS' REPORT**

To the Members of:  
Ontario Centre of Environmental Technology Advancement (OCETA)

We have audited the consolidated financial statements of OCETA as at March 31, 2005 in accordance with Canadian generally accepted auditing standards and expressed an unqualified opinion on these financial statements in our report dated June 7, 2005. This opinion is reproduced below:

In our opinion, these consolidated financial statements present fairly, in all material respects, the financial position of the organization as at March 31, 2005 and the results of operations and cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

In our opinion, the information contained in the attached condensed consolidated financial statements is consistent with the above-mentioned consolidated financial statements from which it was derived.

To obtain a better understanding of the organization's financial position and results of its operations for the year in question, the condensed consolidated financial statements should be read in light of the relevant audited annual consolidated financial statements.

Toronto, Ontario  
June 7, 2005

*Mintz + Partners LLP*

CHARTERED ACCOUNTANTS

**OCETA**  
**Condensed Consolidated Statement of Operations**

<b>For the Year Ended March 31</b>	<b>2005</b>	<b>2004</b>
<b>REVENUE</b>		
Project fees and revenues	\$ 3,428,811	\$ 2,269,622
Environment Canada	400,000	400,000
In-kind contributions	28,000	35,179
	3,856,811	2,704,801
<b>OPERATING EXPENSES</b>	<b>3,750,057</b>	<b>2,590,469</b>
<b>EXCESS OF REVENUE OVER EXPENSES</b>	<b>106,754</b>	<b>114,332</b>
<b>OTHER EXPENSES (INCOME)</b>		
Gain on forgiveness of debt	(19,000)	(130,000)
Loss on write-down of securities	12,779	-
	(6,221)	(130,000)
<b>EXCESS OF REVENUE OVER EXPENSES</b>	<b>112,975</b>	<b>244,332</b>
<b>Net Assets - beginning of year</b>	<b>479,623</b>	<b>235,291</b>
<b>Net Assets - end of year</b>	<b>\$ 592,598</b>	<b>\$ 479,623</b>

**EXCERPTS FROM NOTES TO CONSOLIDATED FINANCIAL STATEMENTS  
MARCH 31, 2005**

**SIGNIFICANT ACCOUNTING POLICIES**

**IN-KIND CONTRIBUTIONS**

Directors' in-kind fees are valued at market rates and will not exceed \$800 per director per day. All other in-kind services provided are valued at market rates.

During the year, the organization received contributions in-kind of \$28,000 (2004-\$35,179). These contributions have been included in operating expenses on the consolidated statement of operations and are summarized below:

	<u>2005</u>	<u>2004</u>
Board fees	\$28,000	\$34,400
Occupancy costs	-	779
	<u>\$28,000</u>	<u>\$35,179</u>

Net expenses for the year, excluding in-kind contributions total \$3,722,057 (2004-\$2,555,290).

**REVENUE RECOGNITION**

- Fees from business and technology consulting, special projects, seminar revenue and expense recoveries are recognized once a deliverable product has been completed.
- Revenue from royalties is recognized as royalties are earned.
- Due to the measurement uncertainty associated with the success of long-term technology demonstration projects, revenue will be recognized as the cash is received.
- The Centre follows the deferral method of accounting for contributions. Unrestricted contributions are recognized as revenue when received or receivable, if the amount to be received can be reasonable estimated.
- Revenue from website sponsorship is recognized over the life of the contract.
- Realization of government funding is subject to government approval from the respective agencies. The amounts recognized as revenue are based on management's best estimate of allowable project costs incurred during the year. The impact of any adjustments due to government verification of allowable project costs will be recorded in the period of verification.

**USE OF ESTIMATES**

The preparation of these condensed financial statements in conformity with Canadian generally accepted accounting principles has required management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent liabilities as of March 31, 2005 and the revenues and expenses reported for the year then ended. Actual results may differ from those estimates.

**COMMITMENTS**

The Centre is obligated under various operating leases for premises and equipment expiring through 2010 to aggregate annual rentals as follows:

2006	\$ 115,055
2007	\$ 115,055
2008	\$ 113,624
2009	\$ 107,521
2010	\$ 113,477

**BOARD OF DIRECTORS****W. Douglas Beynon, Ph.D.**

Doug Beynon has over twenty five years of senior management, technology sector experience and is presently President & CEO at Unisearch Associates Inc., a manufacturer of spectroscopic instruments for environmental monitoring and process control. Prior to this, he worked for five years as OCETA's Regional Vice President. Previously, he was President and Chief Operating Officer at Mindflight Corporation & Mindflight Technology Inc. and Waterloo Engineering Software. Dr. Beynon serves as a Director of Waterloo Engineering Software. He also serves as the Chair of the Advisory Council at the Centre for Business, Entrepreneurship and Technology, University of Waterloo. He is also a Board member of OPTIC (Ontario Photonics Technology Industry Cluster).

**Earl Shannon, Ph.D., P. Eng.**

Earl Shannon is a vice-president and partner with Conestoga-Rovers & Associates Ltd. (CRA), a Canadian environmental firm that provides worldwide engineering, construction, and IT services. He has corporate responsibilities for industrial wastewater and water treatment, and in his 30 plus-year career, has managed numerous projects for North American Fortune 500 companies and public sector clients. Dr Shannon has been involved in South Florida Everglades water quality issues for over 25 years. Prior to joining CRA, he was president of Canviro Consultants Ltd and Envirosite Inc., Ontario Regional Manager for another large environmental consulting firm and Head of Chemical Processes at Environment Canada's Wastewater Technology Centre. He is a former Director of the Consulting Engineers of Ontario (CEO) and has served for over 10 years on the Advisory Committee for the University of Waterloo's NSERC Water Treatment Chair.

**Donald Singleton, Ph.D.**

Donald Singleton has over 30 years of service with the National Research Council Canada (NRC), and is currently Director General of NRC's Institute for Chemical Process and Environmental Technology, which develops technologies that improve the commercial and environmental performance of Canada's chemistry intensive industries. Dr. Singleton represents NRC on several federal government committees related to energy and climate change and recently completed a term on the Grants Review Committee of the Canadian Foundation of Climate and Atmospheric Sciences. Previously, he held the position of NRC Post-doctoral Fellow; Visiting Scientist, National Center for Atmospheric Research, Boulder, Colorado; received NRC's outstanding achievement award.

**Brian E. Denney, P. Eng.**

Brian E. Denney became Chief Administrative Officer of The Toronto and Region Conservation Authority (TRCA), where he has been employed in positions of progressive responsibility for 29 years. He graduated from the University of Guelph in 1974 with a B.Sc. (Eng), Water Resources major. His responsibilities include managing and overseeing all aspects of the organization in an effort to guide the TRCA to work with its many partners to make the Toronto region one of the most sustainable and livable urban communities in the world. He is currently pursuing many initiatives to promote the sustainable communities agenda in the Toronto region. He is a member of the Towards Sustainability in York Region Advisory Group and the Rouge Park Alliance. He is an active participant in Conservation Ontario, the association representing the 36 conservation authorities in the province.

**Dusanka Filipovic, P.Eng.**

Dusanka Filipovic is President and CEO of Blue-Zone Technologies Inc., a corporation that specializes in the reduction of Green House Gas (GHG) emissions in the medical field, sustainable development and life cycle extension of valuable inhalation anesthetic agents using globally patented proprietary technology. Prior to founding Blue-Zone Technologies, Ms. Filipovic was President of Energy and Environment Research Corporation (EER) Canada. Ms. Filipovic also held technical, marketing and business development positions with Union Carbide Canada and Praxair Canada Inc. Ms Filipovic is a recipient of many awards, including the Engineering Medal for Research and Development, PEO (1991); Humanitarian Manning Principal Award for Canadian Innovation (1993); Environment Award for Business, Financial Post (1991); Ontario Waste Minimization Award, Recycling Council of Ontario (1993).

**Gary Cronkwright**

Gary Cronkwright is the Director of the Colleges of Ontario Network for Education and Training (CON\*NECT). CON\*NECT provides business, industry and government with a convenient, single point of access to the education and training resources of Ontario's 24 colleges of applied arts and technology. CON\*NECT works to enhance the profile of the colleges as deliverers of corporate training, and in the process to identify, secure and coordinate multi-site training contracts. Gary is also the Executive Director of the Ontario Environmental Training Consortium (OETC) which tests and licenses all Water/Wastewater operators in Ontario. Mr. Cronkwright has been part of the college system since it was founded in 1968, having served as Vice President, Academic at Cambrian College in Sudbury and as an instructor and Principal at Sir Sandford Fleming College in Peterborough and Lindsay.

**Robert Kerr**

Robert Kerr has been with the International Council for Local Environmental Initiatives – located at ICLEI's World Secretariat in Toronto, Canada - for 10 years, the last 3 as the Director of ICLEI –Canada. Robert has previously been the director of ICLEI's consulting unit providing analytical services to local governments. Mr. Kerr is a graduate of Canada's Trent University in Physics and Environmental Resource Studies and has worked in the environmental and sustainability field since 1979. He has extensive experience in both the public and private sector and has worked within all three spheres of Canadian government.

**Harry Dahme**

Harry Dahme is a senior partner of Gowlings' Environmental Law Group. He has practised exclusively in the areas of environmental and municipal planning law since 1984 and has a solid reputation as one of the foremost environmental lawyers in Canada. Harry is certified by the Law Society as a specialist in environmental law and has been recognized as one of the foremost environmental lawyers in the world by the U.K. publication *International Corporate Law* and by the U.K. based Euromoney Legal Media. Gowlings is recognized by the *LEXPERT Directory* as being among the most frequently recommended leading firms in the area of environmental law and Harry Dahme is "consistently recommended" as one of the leading practitioners of environmental law in Ontario.

**Richard Morris**

Richard Morris is the Managing Partner of the Better Buildings Partnership and Manager of the City of Toronto's Energy Efficiency Office. He has led the development and growth of the Better Buildings Partnership program to focus on curbing carbon dioxide (CO<sub>2</sub>) emissions across the city. Through his leadership the program continues to make a significant contribution to the goals and objectives of the City of Toronto, namely environmental improvement, job creation and economic development. His background includes extensive experience in the areas of nuclear power production, electric utility management, energy sales and marketing, energy efficiency, business development, innovative financing, public/private partnerships and municipal administration. He is a member of a number of industry organizations and has served on a broad variety of panels and taskforces.

**Howard D. Goodfellow, Ph.D.**

Dr. Goodfellow is President of Techint Goodfellow Technologies (TGTI), a Canadian based technology company that sells and markets Goodfellow EFSOP™ (Expert Furnace System Optimization Process), an award winning software and hardware technology system. He is an Adjunct Associate Professor at the University of Toronto where he teaches a graduate course in ventilation and conducts Research and Development in the ventilation and indoor air quality field. Dr. Goodfellow was awarded the 2T5 Meritorious Service Medal of the Engineering Alumni Association of the University of Toronto for his outstanding contributions as an engineer, teacher, researcher, author and administrator in the field of ventilation and occupational health at the University of Toronto, with global recognition for achievements in the advancement of environmental consulting. Dr. Goodfellow has been an active member of the Iron & Steel Society (ISS) and the AISE for more than 25 years. He has presented and/or published more than 100 technical papers internationally. He has been a contributing editor to reference books published by ASHRAE and AWMA and author of two (2) scientific textbooks.

**Dan McGillivray, M.Sc., Ph.D.**

Dan McGillivray brings a unique mix of skills and experience to his portfolio having worked as an environmental consultant, a university professor, a physical oceanographer and the president and CEO of Environmental Software Consultants Inc. He received his M.Sc. and Ph.D. from the University of Toronto, specializing in Earth and Environmental Sciences. He currently serves as a director on the boards of OCETA (Ontario Centre for Environmental Technology Advancement) and ONEIA (Ontario Environment Industry Association). Dan joined CRESTech in October 1997, initially as Director, Business Development & Technology Transfer - Earth Systems and was appointed Interim Managing Director in October 2004. He is now Managing Director of the Centre for Earth and Environmental Technologies (formerly CRESTech).