36TH ANNUAL
WEAO TECHNICAL SYMPOSIUM
& OPCEA EXHIBITION
APRIL 15-17, 2007
LONDON, ONTARIO

PLUS
Focus on COLLECTION SYSTEMS
SPOTLIGHT on Dr. Gail Krantzberg
Cost Effective Solutions For Your Water and Wastewater Treatment Needs

Design, Build, Finance, Own and Operate Water/Wastewater Treatment Facilities

We Specialize in:
- Potable Water Treatment Solutions
- Wastewater Treatment Solutions
- Pilot Plants and Process Evaluation
- Process Logic Automation and SCADA
- Package Valve, Pump and Flow Meter Systems

For full information call our toll-free line at:
1.800.500.8855
info.watersystems@corix.com
www.corix.com

AGENT FOR:
- CLA-VAL
- HYDRAUTOLOGY
- FEBCO
- ApCo
- DeZURIK
WEAO Board of Directors
2006 - 2007

President
Vincent Nazareth P.Eng.,
R.V. Anderson Associates Limited
Tel: 416 497-8600 Fax: 416 497-0342
Email: vnazareth@rvanderson.com

Vice-President
Peter Takacoka P.Eng.,
R.V. Anderson Associates Limited
Tel: 416 497-8600 Fax: 416 497-0342
Email: ptakacoka@rvanderson.com

Past President
Cordell Samuels, Region of Durham
Tel: 903 468-2004 Fax: 903 686-0661
Email: cordell.samuels@region.durham.on.ca

Directors
George Lai, Ministry of the Environment
Tel: 416 527-3528 Fax: 416 527-5091
Email: george.lai@ene.gov.on.ca

Ian McIlwraith, Region of Durham
Tel: 903 668-4113 Fax: 903 686-0661
Email: ian.mcilwraith@region.durham.on.ca

Tim Constantine,
CH2M HILL Canada Limited
Tel: 416 499-0090 Fax: 416 499-4687
Email: tconst@c2m.com

Mark Rapke, City of Toronto
Tel: 416 392-5160 Fax: 416 327-0908
Email: mrapke@toronto.ca

Don Kemp, Totten Sims Hubicki Associates

Rick Niesink, Region of Niagara
Tel: 905 933-8313 Email: rick.niesink@regional.niagara.on.ca

Treasurer
John Presta, Region of Durham
Tel: 903 668-7723 Fax: 903 668-7494
Email: john.presta@region.durham.on.ca

Executive Director
Catherine Jefferson
Phone: 416 410-8533 Fax: 410 651-7006
Email: catherine.jefferson@weao.org

Executive Administrator
Julie Vincent
Phone: 416 410-6933 Fax: 410 410-1626
Email: julie.vincent@weao.org

WEF Director 2003 – 2004
Tony Petrucci, CH2M HILL Canada Ltd.
Tel: 416 499-0090 x302 Fax: 416 499-4687
Email: tony.petrucci@ch2m.com

WEF Director 2006 – 2009
George Crawford, CH2M HILL Canada Ltd.
Tel: 416 499-0090 x201 Fax: 416 499-4687
Email: gcrawford@ch2m.com

OWA Representative 2007/2008
Rosanna Dalibao, Praxair Canada Inc.
Tel: 905 490-3157 Fax: 905 601-2294
Email: rosanna_dalibao@praxair.com

OWA Representative 2006-2007
Bob Lecot, RAL Engineering Ltd.
Tel: 905 853-8626 Fax: 905 853-8807
Email: bob@raleng.com

PWEO Representative
John C. Thompson, Region of Durham
Tel: 905 576-7844 Fax: 905 576-8611
Email: john.thompson@region.durham.on.ca

OPCEA Representative
Brian Allen, Indachem Inc.
Tel: 416 743-3751 Fax: 416 743-2038
Email: bali@kedco.com

New Professional Representative
Vanessa Chan, Regional Municipality of York
Tel: 905 830-4444 Fax: 905 830-6927
Email: vanessa.chan@ymca.on.ca

TABLE OF CONTENTS

FEATURES

36TH ANNUAL
WEAO TECHNICAL SYMPOSIUM & OPCEA EXHIBITION ........... 17

Focus on
COLLECTION SYSTEMS

The Application of Radar Rainfall Data to Collection System Analysis ..... 50
Wet Weather Woes - Hamilton’s Storm Event Response ....... 54
Seminar Report
Assessment/Rehabilitation of Linear Infrastructure ............... 58
Ottawa Forcemain
Goes in Trenchless ..................... 60

Water for People: Canada and Bolivia ..................... 66

DEPARTMENTS

President’s Message ....................................................... 4
Executive Director ...................................................... 8
In the Spotlight: Dr. Gail Krantzberg .......................... 10
Committee Reports ...................................................... 12
Internal Affairs ............................................................ 36
Regulatory News ......................................................... 48
 Operator’s Corner ....................................................... 68
Certification News ....................................................... 72
OPCEA News ............................................................. 72
WEF News ................................................................. 72
Plant Profile ................................................................. 73
Calendar of Events ...................................................... 76
Professional Directory .................................................. 77
Directory of Advertisers ................................................ 78

Cover: London, Ontario courtesy of Tourism London

©2007 Craig Kelman & Associates Ltd. All rights reserved. The contents of this publication, which does not necessarily reflect the opinion of the publisher or the association, may not be reproduced by any means, in whole or in part, without prior written consent of the publisher.
A TIME TO REFLECT . . .

As I sit down to write this, the last President’s message that I will have to write, I must admit I have mixed feelings. There is a little jubilation in knowing that I will be able to pass the responsibility of the presidency on to a worthy successor, but there is also a little sadness. For while this has been a very busy year, filled with a variety of duties and responsibilities, there have been many rewarding moments, especially those which presented the opportunity to interact with our volunteers, young and not so young, our operators at conferences and operations challenge events, and with members at social gatherings. But, before I reminisce, I need to tell you about an important addition to our association.

Executive Director appointment
I am pleased to inform you that, after careful consideration and in keeping with our strategic plan, we have hired Catherine Jefferson as our Executive Director. Catherine has been involved in the environmental sector all of her career, having worked at the Ministry of Environment (pollution prevention, pesticide control, protection of surface and groundwater supplies), Environment Canada (co-ordinating and managing Municipal Wastewater Effluents), and as a surface water quality superintendent for a regional municipality. More recently, she has been the Director of Government Relations for the Canadian Water and Wastewater Association (CWWA). Her knowledge of environmental issues and experience in dealing with government agencies, both provincial and federal, will be of great help to the association as we move forward with our strategic plan. For a more detailed biography, please see the Executive Director Profile on page 8 of this issue. Catherine will be at the Conference in London. Please welcome her to our association and, if you get a chance, tell her your vision for WEAO.

‘Facing’ our future
Almost two years ago, our strategic planning session brought to light the dramatic impacts that demographics will have on our industry. The departing workforce over the next 10 to 15 years, coupled with lower enrolments in the professions that serve our industry will become a major obstacle to progressive improvement in the environment. As a result, we identified the need to increase our focus on recruitment of young and new faces to the industry and to our association.

The strategy revolves around ‘growing’ our presence in institutions of learning by setting up student chapters to add to the one at the University of Toronto. The bulk of this work is being ably handled by our New Professionals Committee, which has targeted the following institutions for starting student chapters: University of Waterloo, Ryerson University, University of Guelph, McMaster University and Sheridan College. They are hopeful that the chapters at Ryerson and Sheridan will be formalized this year.

We also decided to launch a Scholarship Program aimed at students in an environmental field. We anticipate a modest start, but we are cautiously confident that, with the support of our members, we can build this into an annual award total of $5,000 to $10,000.

As we recognized that newcomers to the profession will be the ‘future face’ of the association, the Board appointed a new professional to participate at the Board – as a kind of apprenticeship. This year Vanessa Chau has been the NP representative and it has been decided that the NP Committee Chair will continue in this role in the future. We are also hoping that two of our new professionals will attend the Young Professionals Summit in Chicago immediately following our Conference where they will have a chance to interact with their peers from other member associations.

INFLUENTS – a positive start
Our INFLUENTS magazine has grown from strength to strength, receiving a lot of attention from other member associations, and becoming one of the more successful ventures of the association. Requests for ad space have surpassed expectations and we expect to receive a ‘bonus’ in revenues from our contract with Kelman and Associates Ltd. I would urge members to continue to
We have embarked on some important strategic initiatives this year that will, I believe, strengthen the association and raise our profile.

Contribute ideas and articles to make the magazine even more appealing. Send your ideas/articles to Emil Cocirla or Julie Vincent. If not an article, then how about suggestions or feedback – let’s hear from you (For more information, see page 56).

Vote of thanks
As time moves on, stalwart members of the Board step down to focus on other ventures. In December 2006, Cindy Toth completed her tenure as CWWA representative at the Board. Cindy has been an active volunteer with the association for many years, having played a key role in forming and developing our Public Education Committee, and serving on our Communications Committee. Cindy has also been the mainstay in our role for the Stockholm Junior Water Prize, a role that she has kindly agreed to retain – all this in addition to being a Board member. Thank you Cindy, for all your efforts over several years and, in particular, for your efforts on the Board in 2006. We welcome Rosanna DiLabio who will take over from Cindy as CWWA representative.

John Thompson completed his role as WEF Director and is now PWO Rep. For readers of INFLUENTS, you will see John’s handiwork in the Operations Corner section of the magazine. The articles are always well presented and the mix of information is being well received. John has also served in a number of capacities primarily dealing with operational issues. We are grateful to John for his past efforts and even more grateful that he has agreed to stay on as PWO Rep. George Crawford Jr. replaces John as WEF Director.

President’s diary
The Ministry of Environment hosted a Solutions through Innovation Day to showcase and celebrate innovation within the Ministry. Speakers included Carl Griffith, Assistant Deputy Minister (Environment), Paavo Kivisto, Deputy Minister (Environment) and Alastair Glass, Deputy Minister (Research and Innovation). The day provided the Ministry an opportunity to highlight its own efforts to bring a culture of innovation to the business of protecting the environment. A complete report is presented in an article entitled “MOE Hosts Solutions through Innovation” on page 38.

Nancy Bonham (Government Affairs Committee) and I represented the association at consultation meetings hosted by the MOE, to help develop Ontario’s response to the Canada-wide Strategy for Municipal Wastewater Effluents. The second meeting and a national consultation session were held in January. There will be a report on these sessions and the strategy as a whole in our next issue.

I am glad to say that it has not been all work since the last issue, and I did get a little time to ‘play.’ If you want to “get down, have a little fun or just chill,” then let the NPs show you the way. I thoroughly enjoyed meeting the New Professionals at their Holiday Bash held in conjunction with their OWWA counterparts, at the Charlotte Room. Of course, some beer, mixed
with my less than sterling attempts at pool (much like my golf!), helped to round off the evening quite nicely. It was great to interact with such an enthusiastic bunch, and, when I left the gathering, things were still going strong. Thanks to Vanessa and her crew for organizing the “do”.

Privilege and honour to serve
As my year in office comes to a close, I must say that it has been a privilege and honour to serve as your president. I would like to thank you for the trust that you placed in me.

We have embarked on some important strategic initiatives this year that will, I believe, strengthen the association and raise our profile. Some of these will increase our operating budget and the Board is considering options to address the need for increased revenues to offset the increase in expenditures. We will notify members of our plans leading up to the conference, and table them as part of the treasurer’s report at the AGM, which I hope you will attend to make your views known.

I am extremely grateful to all our volunteers, without whom our association would not be able to function the way it does, nor would it be what it is today – a leader in the exchange of information and knowledge pertaining to the environment. Our success is due to all of them, in particular their willingness to contribute vast amounts of their time from schedules that are as busy as they have ever been. With approximately 130 volunteers serving the Board and various committees, we estimate that they contribute somewhere between 13,000 and 20,000 hours annually, which is something that we could never pay for, but for which we must find better ways to acknowledge and recognize.

Finally, to all of you, the whole experience of serving as president has been a very rewarding one, and one that I am very grateful for. Thank you for this, and, once again, if you are not a volunteer please consider trying it – you will not regret it.

I look forward to seeing you at the annual conference in April.

Vincent Nazareth, P. Eng.
R.V. Anderson Associates Limited

Claessen Pumps
Servicing The Canadian Industry Since 1976

Distributors of:

GRINDEX
POWER PRIME PUMPS

Phone: 705-431-8585 Fax: 705-431-2772
For More Information please contact us or visit our web site at www.claessenpumps.com
JEFFERSON IS NEW WEAO EXECUTIVE DIRECTOR

EAO is pleased to announce that Catherine Jefferson has joined the team as Executive Director. Catherine has an MSc degree from the Watershed Ecosystem Program at Trent University, specializing in aquatic toxicity. She joined the Ontario Ministry of the Environment in 1977 developing and implementing contaminant monitoring programs for inland waters and the Great Lakes, chasing contaminant sources from industry, municipal inputs, and agriculture. Catherine ran the aquatic nuisance control program for MOE in the pesticide section, before moving to the Great Lakes Section to work on IJC and COA issues.

Catherine’s varied background has taken her to Western Australia and across Ontario providing advice to: the Departments of Health, Agriculture and Conservation Authorities for the development of pesticide operator training, and development of environmental monitoring programs; to the MISA development programs for the municipal and organic chemical sectors; undertaking a variety of environmental assessments, pesticide and other water related issues; and led to accepting the position of Superintendent of Surface Water Programs, Regional Municipality of Ottawa – Carleton, where she established a variety of environmental monitoring programs.

Catherine joined Environment Canada in 1995, working on the development of environmental quality guidelines through CCME. Her experiences with Environment Canada included working on CEPA review, upgrading of the Municipal Uses Database (MUD), and working on the development of the department’s policy and programs on municipal wastewater effluents. Since 2001, she has been involved as an owner operator of Carry Jefferson & Associates Environmental Services Inc. providing support to the Canadian Water and Wastewater Association on issues such as CEPA review, NPRI, HACCP and MWWE. Other clients have included Health Canada, the Public Health Agency, Environment Canada, engineering consulting firms (environmental impact studies), and private land owners.

Catherine is a member of WEF, WEAO, CWWA, IWA, CWRA, Eastern Ontario Soils and Crop Improvement Association, and more recently has been on the Board of the Chamber of Commerce Eastern Region, and the Executive and Board of Peterborough Greenup.

Catherine lives on a farm east of Peterborough with her four legged friends – Max, Latté and Mocha. She is looking forward to working with WEAO members and others on issues affecting our environment.
Creating Water Solutions

- **BIOSTYR** Biological Aerated Filtration
- **ACTIFLO** High Rate Treatment
- **Membrane Solutions** for water & wastewater
- Full Line of **Headworks** Equipment
- **Stormwater Management** Solutions
- Complete Line of **Instrumentation**
- **UV / Ozone Disinfection**
- **Dewatering & Sludge Management**
- Energy Efficient **Blower Technology**
- **Pilot Study** capabilities

John Meunier Inc.
T. (905) 286-4846
F. (905) 286-5805
sales@johnmeunier.com
www.johnmeunier.com
Dr. Gail Krantzberg always had a passion for the environment, and a desire to see it valued.

A native of Montreal, she began her academic career at McGill University in ecology. She pursued graduate studies at the University of Toronto examining heavy metal cycling in the environment. Her post-doctoral work was in ecotoxicology and sediment bioassessment with the Ministry of the Environment. She was working on inland shield lakes, tracing the effects of acid rain, which led her to study the Great Lakes.

The shield lakes are very sensitive to the effects of acid rain due to a lack of buffering capacity to acidification. Krantzberg was concerned over the loss of biodiversity in these lakes and how they may have been affected by heavy metal toxicity.

So, when the Ministry of the Environment became interested in her work and asked her to work with the Great Lakes, her initial reaction was to decline.

“At the time, I thought the Great Lakes were so vast and untouchable, that there should not be any problems. But, the more I came to know them, the more I saw how vulnerable they are.”

She began her work on the Great Lakes as a sediment specialist, assessing sediment contamination in Areas of Concern (AOCs), of which Canada had 17. “The Great Lakes are exquisitely susceptible to human pressure. For example, chemicals can reside in the lakes for nearly 200 years,” says Krantzberg.

She quickly became the co-ordinator of the Collingwood Harbour Remedial Action Plan. “In that situation, we were faced with harbour eutrophication, habitat loss, and sediment contamination. The remediation process looked at the ecosystem from a watershed point of view – water quality, fisheries, toxic chemicals, nutrient enrichment, human stewardship, etc.” The plan was completed in 1994, and was the first to see completion.

Krantzberg also worked as the program co-ordinator for remedial action plans in Ontario, and as senior policy advisor for the province on Great Lakes issues, translating science and technology into remediation and protection policies and programs.

Before her post at McMaster, she was Director of the Great Lakes Regional Office of the International Joint Commission, overseeing the work of the two governments in protecting and advancing the environmental quality of the lakes.

Working with such diverse groups allows Krantzberg to help shape the future of the lakes. “I work with teams of scientists from academia, industry, and government to provide an analysis of how well the lakes are progressing, what the emerging stressors are, and what the policy response ought to be.”

Although gains have been made, vigilance will always remain.

“This is a critical time for the Great Lakes, with attention from thousands of scientists, governments, communities, and academics” says Krantzberg. The Great Lakes Water Quality Agreement, first penned in 1972 and revised in 1987, is again under critical review. Krantzberg is optimistic about the future.

“There are positive signs of enlightenment in the industrial sector, and also on the part of government. The Agreement has not been touched in 20 years, and some aspects have not been touched for 35 years, so there is an opportunity here. Science has evolved, policies have evolved, so it is time to bring the document into the 21st century.”

There is a companion piece to the Agreement on the Canadian side called the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem which expires in March 2007. The Ontario government has publicly announced that it is committed to renewing and renegotiating a bolder, more aggressive agreement.

With this commitment, and a new federal environment minister, the immediate future of the lakes should prove to be interesting.

There has been an attitude shift in some industries toward the lakes, but some industries have been recalcitrant, and do not participate in cleanup or prevention. The idea that the environment imposes upon the economy is still prevalent in some circles, but public demand may cause that to change.

“The public wants action on the environment, and, in this region, people are highly protective about water. We are sitting on the largest surface freshwater body on the planet. The motivation for proper stewardship of the waterways is increasing,” says Krantzberg.
Organizations such as the Water Environment Association of Ontario have an important role to play in the process, Krantzberg says. Such groups have the opportunity to showcase technologies and policies, and develop innovative engineering solutions to protect water quality or improve treatment. But, it is important to do so before “the end-of-the-pipe solution,” she says.

Emerging concerns such as pharmaceuticals in the water supply are being picked up by the media and taking hold in the public consciousness. Associations like the WEAO can promote the development of technologies to destroy these substances in wastewater effluents, so they do not enter the lakes and then have to be dealt with on the drinking water side.

Discussing policies at conferences and fostering dialogue also plays an important role, says Krantzberg. “Linking the engineers and policymakers at forums is paramount for positive movement towards sustainability.”

Krantzberg feels fortunate to have worked in a bi-national atmosphere. The benefits include many colleagues on both sides of the border from all levels of government, as well as from industry and academia.

“That gives me a broad perspective on different jurisdictions and their opinions, societal perceptions, and industry positions. Sometimes they align and sometimes they do not.”

One thing all groups associated with the lakes have in common is passion, one that Krantzberg shares. “There is a passion that permeates from across all sectors that is invigorating,” she says.

Krantzberg’s Master’s students at McMaster University’s Dofasco Centre for Engineering and Public Policy often catch the Great Lakes bug as well. “I think everyone who ends up working on the Great Lakes becomes an addict. There is a visceral connection to the vastness of the place, its power and its fragility. You can talk to any stakeholder and come away with a sense of wonder. That helps drive a common vision.”

Although attitudes are changing, some still have a utilitarian view of nature, and see resources as things to be used, and ecosystems as things to be ‘managed’.

“We can not manage ecosystems, they manage themselves. But, some people still have a Promethean view that we are all-powerful and nothing we do will be irreversible.”

Getting people to value ecosystems for their own sake may not be necessary, however. “I am not sure if we need that degree of paradigm shift,” says Krantzberg. “As long as people understand the linkage between a healthy environment, quality of life, and a healthy economy, and that they go hand-in-hand-in-hand – that is the degree of education we need.”

Krantzberg will continue her work with the lakes because, despite their majesty and power, they need help. “I want to work for the ecosystem because it has no voice, and I want to be its voice.”

By Cheryl Parisien
New professionals presentation at Sheridan College
On December 5, 2006, the New Professionals continued their effort with the student outreach program at Sheridan College, Davis Campus, making this our first presentation geared towards college students. Bill Costigane and Terry Davison graciously assisted with the planning of the event. Both provide monumental care and support for the School of Applied Computing & Engineering Sciences program at Sheridan.

Attendance was quite remarkable, with over 30 students present from different environmental programs. There was a good mixture of students representing different years in their respective environmental program. Vincent Nazareth conducted an uplifting and insightful presentation on the industry, describing his experience, statistics and different job opportunities that students should consider after graduation. He also discussed a successful account of a college graduate who is currently employed in a consulting firm. Their experience and transition to the job market provided hope of a successful career in our sector.

The second presenter, Kelly Dechert, discussed the transition from student to municipal planner and to professional engineer. Her experiences also gave valuable reference to students on how to find careers in either the public or private sector.

The presentation continued with a talk on the sales and contracting cycle with special emphasis on the tendering process so that students could have a summarized view of how projects are thought of from conception to the commissioning of systems.

The presentations are geared to open up students to different career opportunities and to provide them with high prospects of finding their career path soon after their graduation. The importance of becoming a WEAO member was also highlighted as a complement to this goal and to be thought of as a ‘win-win’ situation for their future, as it benefits themselves and their future employers.

Asset management seminar
In keeping with WEAO-NP commitment to continuing education through technical development, the New Professionals Committee organized a well received seminar of Asset Management in the Wastewater Industry held on Monday, December 4, 2006. Attendance was limited to a maximum of 25 registered participants and a total of 31 new professionals benefited from the two presentations.

Presenters included two leading professionals in the Asset Management field: Roop Lootchman from CH2M-Hill and Terry Martins from UEM Consulting. Our speakers discussed everything from fundamentals of asset management to its benefits, supporting data architecture, technology, business processes and more.

Seminar participants also gained valuable knowledge from the Q&A session that followed the presentations and had the chance for bit of a social time during the break.

Special thanks to Roop Lootchman and Terry Martins our presenters, and to Anania and Diana Senior of CH2M-Hill for hosting this seminar.

New and young professionals
3rd annual Holiday Bash
The third annual Holiday Bash between the Ontario Water Works Association (OWWA) Young Professionals and Water Environment Association of Ontario New Professionals was held on Friday December 1, 2006 at the Charlotte Room in downtown Toronto.
In the past few years, a number of communities in southern Ontario have been hit hard by extreme storm events, resulting in surface and basement flooding, and millions of dollars in insurance claims (see related article on page 54). Also, there is a growing recognition of the effect of pollutants in stormwater on water quality in Ontario’s lakes and rivers. At the same time, recent legislation (the Clean Water Act) is requiring that water quality, and, accordingly, source water protection, be considered on a holistic watershed basis.

In recognition of the increasing prominence of these issues, WEAO recently formed a Stormwater and Watershed Issues Sub-committee (SWIS), as a sub-committee to the existing Collection Systems Committee. The mandate of SWIS is as follows:

To provide WEAO members a focal point for information pertaining to water quality issues on a watershed basis including:

- Stormwater impacts on water quality, both surface waters and groundwater, and the manner in which stormwater management is applied to mitigate impacts;
- The consideration of water quantity as it relates to water quality issues and the application of stormwater management;
- WWTP effluent and CSO/stormwater (wet weather) considerations in watershed planning and source water protection.

The inaugural meeting of SWIS was held on June 12, 2006. A great deal of interest has been shown in the sub-committee and a large number of volunteer members have come forward. The current membership of the committee stands at 11, with representation from large urban and rural municipalities, consulting companies and provincial agencies. The present chair, vice-chair and secretary are as follows:

**Chair**
Carl Bodimeade

**Vice-Chair**
Harold Chard

**Secretary**
Bruce Gall

SWIS welcomes any suggestions from the WEAO membership as to the issues and activities in which it should be involved. If you have any suggestions, or wish to volunteer for the sub-committee, please e-mail Carl Bodimeade at carl.bodimeade@hatchmott.com.

Carl Bodimeade, Hatch Mott MacDonald

WEAO recently formed a Stormwater and Watershed Issues Sub-committee (SWIS)
within our working areas, we face the everyday challenge of ensuring that an environmentally responsible, safe and healthy work environment exists. We strive to do this by being proactive in identifying risks and emerging issues and by developing and implementing innovative, practical and sustainable processes to manage them, including training/awareness, teaching, provision of expert advice, emergency response and assurance.

To assist WEAO members in tackling their everyday tasks, a new Environmental, Health, Safety and Security (EHS&S) Committee has been formed and will function as a sub-committee of the WEAO Professional Development Committee.

EHS&S Committee Mandate is:

• To convey information and developments in standards, policies, applicable laws and best management practices related to environmental, health, safety and security within the wastewater industry
• To provide a discussion forum for a broad base of expertise regarding environmental, health, safety and security issues
• To promote EHS&S and foster a credible ‘EHS&S culture’

Mark September 12 on your calendars

The EHS&S Committee has partnered with OWWA and OMWA in the organization of a ‘Safety Day’, tentatively scheduled to be held in the greater Toronto area on Wednesday, September 12, 2007.

Topics under consideration include:
• Confined Space Entry
• Chlorine & Disinfection handling
• Excavating around underground utilities

If you are interested in participating on the EHS&S Committee, or any other WEAO committee, please contact the WEAO office at: julie.vincent@weao.org or (416) 410-6933.

Bob Crane, Chair, Professional Development Committee
Have you looked at UV lately?

HERE’S WHY YOU SHOULD.

The TrojanUV3000Plus™ provides the reasons why you should be taking a closer look. This highly flexible system has demonstrated its fully validated and reliable performance around the world in over 475 installations. The TrojanUV3000Plus™ is ideal for challenging wastewater disinfection applications such as combined sewer overflows or primary and tertiary wastewater reuse.

TrojanUV is simple and safe to operate, with performance guaranteed for the life of your system. Reduce operation & maintenance costs, while eliminating disinfection by-products and the risks of chemical hazards to operators and your community.

Find out how your wastewater treatment plant can benefit from the TrojanUV3000Plus™. Call or visit us today.

www.trojanuv.com

Represented by:
H2Flow Equipment Inc.
470 Rivermeade Rd. #7
Concord, ON L4R 3R8
T. 905.660.9775

H2Flow EQUIPMENT INC.

Michael Albanese
michael@h2flow.com

TROJAN UV
Racing to Niagara Falls, Ontario
with the Latest in Quality Trenchless Education
May 28 – June 1, 2007
The Brock Plaza Hotel

FEATURING
Brand New Expanded Session Topics including:
- Asset Management
- Sub-Surface Utility Location & Mapping
- Successful Trenchless Rehab Projects
- Water Main Rehabilitation
- Tunneling & Microtunneling
- HDD Applications for Water & Sewer Projects

Specialized Seminars
- NAAPI Reviewers Certification Course
- NAAPI Asset Management Course
- Trenchless 101 Course
- NASTT Lateral Course
- NASTT Cured-in-Place Good Practices Course

Networking opportunities with Industry Leaders in the Exhibit Hall
Live Outdoor Demonstrations

The Trenchless Road Shows are built on over 10 years of experience in providing quality education to municipalities, engineers and utility contractors. We bring seminars, exhibits and demonstrations to you.

REGISTER TODAY!
www.trenchlessroadshow.com
36th Annual WEAO Technical Symposium & OPCEA Exhibition 2007

London Convention Centre
London, Ontario
April 15 - 17, 2007

The largest Canadian Technical Conference for the Wastewater Industry

OUTFALL FALLOUT
WEAO TECHNICAL SYMPOSIUM

WELCOME FROM THE CHAIR

I would like to take this opportunity to invite you to join us for the 36th Annual WEAO Technical Symposium and OPCEA Exhibition at the London Convention Centre and Hilton Hotel. The Conference Committee has been working diligently to make this an informative and fun event for all attendees, and we are certainly happy to be bringing the conference back to the City of London for 2007.

The conference theme, Outfall Fallout, is timely, and the Technical Steering Committee, along with the PWO, New Professionals, Wastewater Collection Systems, Wastewater Treatment & Technology, Residuals & Biosolids, Public Education and Government Affairs committees have sorted through a plethora of abstracts and put together a fantastic technical program. The technical program this year features several new sessions.

The expanded floor space available at the Convention Centre this year promises to make the OPCEA Exhibition bigger and better than before, which is no easy feat. This year, we are expecting approximately 120 booths in the exhibit area displaying the latest and greatest services and technologies on the market.

Of course, the success of the conference would be greatly diminished without our professional wastewater operators, who will once again showcase their expertise and skills in the Operations Challenge area adjacent to the OPCEA Exhibition.

On behalf of all the hard working volunteers, I look forward to seeing everyone in London this April.

John Leve
Conference Chair

PRESIDENT’S WELCOME

The 36th WEAO Technical Symposium and OPCEA Exhibition will be held this year at the London Convention Centre. Past Conferences in London have proven to be highly successful and this year will be no exception.

The conference theme this year – “Outfall Fallout” - encapsulates the wide array of issues facing the industry today. As we continue to move forward in the third millennium, our members are faced with new and changing regulations, more stringent effluent discharge limits, challenging fiscal constraints, a more knowledgeable and vocal public, and a decaying infrastructure. We recognize advances in technology, which allow us to meet the new regulatory requirements, but we are faced with new challenges. Just think of the new contaminants of concern, finding their way into our waterways, include pharmaceutical products, residues and endocrine disruptors; and we need to start to respond to these issues now.

So as we try to preserve and enhance our environment, and strive for sustainability, we will need to better understand our challenges if we are to find solutions for them. The 2007 WEAO Annual Conference presents the ideal opportunity to expand our knowledge in this regard, with a promising technical program and the best environmental equipment exhibition this side of the 49th Parallel, not to mention the excitement of the Operations Challenge. Yes a very full slate indeed!

I look forward to seeing you in London; I have no doubt that it will not only be enjoyable but highly rewarding too.

Vincent Nazareth, President,
Water Environment Association of Ontario

THE ONTARIO POLLUTION CONTROL EQUIPMENT ASSOCIATION

OPCEA expects approximately 120 member companies to come together to exhibit their equipment and services for the Water & Wastewater industry. Many consultants, operators and other industry professionals who will be looking for new ideas, technologies and professional expertise from the OPCEA exhibitors will attend the OPCEA trade show. Take this excellent opportunity to bring yourself and others in your group up to date on what’s new in the equipment and services side of the industry. Be sure to join us for a relaxed get-together during our Monday evening reception where you will have the opportunity of discussing current issues with other attendees or join us on Tuesday for lunch in the exhibit area.
OPENING ADDRESS
2007 will see the creation of an exciting new position at WEAO, the office of the Executive Director. As part of the inaugural duties of this position, the new Executive Director will address the attendees and delegates at the 2007 WEAO Symposium to start the conference.

The Executive Director is not all that is in store at the Opening Address. Other dignitaries and persons of interest are eagerly waiting to welcome all attendees to the 36th Annual WEAO Technical Symposium and speak to items that are timely and fitting with the theme of this years’ conference.

OPERATIONS CHALLENGE
Come see some of the best wastewater personnel in Ontario display their expertise during the 36th Annual WEAO Technical Symposium and OPCEA Exhibition. The event will mark the 17th consecutive year for the Operations Challenge Competition.

Participants are required to compete in five events testing their skills and knowledge against competitors throughout the Province. The five events are Collection System, Laboratory, Process Control, Pump Maintenance and Safety.

Each Operations Challenge Team must follow the Water Environment Federation (WEF) requirements that team members be drawn from Professional Wastewater Operators (PWO) members, currently employed or retired, from one or more facilities or municipalities and each team must be comprised of at least two operators in non-supervisory roles. The winning team is eligible to represent Ontario in San Diego, California at WEFTEC 2007.

Interested in Participating?
Be a part of the Operations Challenge Competition by demonstrating your region’s expertise and professional-ism by entering a team or becoming a volunteer on the Committee. For more information or to register for the Operations Challenge, please contact Gary Burrows at 519-661-0350 or gburrows@london.ca or visit www.weao.org/committees/Operations_Challenge/Operations_Challenge.html.

“TOTALLY WASTED” GAME SHOW
Test your knowledge of wastewater. Participate or follow along and cheer as teams compete for top prizes and bragging rights in the 8th annual Totally Wasted Game Show (TWGS) that will take place following the Operations Challenge Competition in Ballrooms 1 and 8.

Fashioned after a popular TV game show, the TWGS quizzes contestants with questions comparable to those found on Provincial Certification Exams. The TWGS is both educational and entertaining. Will “Two Martins and a Mark” (Martin Doyle – Troy-Ontor Inc., Martin Van den Heuval – Durham Region and Mark Rupke – City of Toronto) return to defend their 2006 Championship? Teams should be comprised of a consultant, OPCEA supplier and professional operator. Don’t delay the first four teams confirmed will be the contestants for the 2007 Totally Wasted Game Show? Please contact Gary Burrows at 519-661-0350 or gburrows@london.ca for more information or to register.

GUEST PROGRAM 2007
The program starts Monday with breakfast at the hotel and then off to see some whimsical garden and home decor products. The morning will finish with a visit to an antique gift shop and candle manufacturer. After lunch at a countryside tearoom we will be visiting a rural local gift shop and gallery.

On Tuesday after our breakfast we will be heading to a workshop on scrap booking. Please bring with you 8 – 10 photos from one event or theme and we will complete a project using these photos. We’ll have our lunch and then participants can return to the hotel or have some leisure time to visit some of the stores in downtown London.

Register early, as there is a maximum limit of 10 participants.

OETC EXAM
NEW! The Ontario Environmental Training Consortium (OETC) will host a Wastewater Operator Certification Examination session on Tuesday April 17 at the WEAO Conference! All levels of Wastewater Treatment and Collection will be offered, including Operator-in-Training (OIT), but space is limited so sign up soon!

Participants wishing to register for the exam must submit their application form directly to the OETC no later than March 17, 2007. The application form and instructions can be found at www.oetc.on.ca/exams.asp. For information purposes only, if you are intending to register for the examination with the OETC please also check the box on the Conference Registration form. Please note that checking the box on the Conference Registration form will not register you for the examination, you must register with the OETC.
PROFESSIONAL WASTEWATER OPERATOR TECHNICAL SESSION AND TOUR

PWO TECHNICAL SESSION
In keeping with the conference theme “Outfall Fallout” this year’s PWO Technical Session will include presentations from Can-Am Instruments and Trojan Technologies. The MOE will also be stopping by to discuss O.Reg. 129/04 and answer your questions. To sign up for the PWO Technical Session you must register for at least the Monday of the 2007 WEAO Conference in London, Ontario at www.weao.org and check off the box indicating that you will attend the PWO Technical Session.

SUNDAY TOUR
ADELAIDE PCP AND TROJAN TECHNOLOGIES
The PWO Tour on Sunday, April 15th will start with a tour of the City of London's Adelaide Pollution Control Plant. Representatives will be on hand to demonstrate and discuss Storage Systems, Rotating Drum Thickeners, UV Technology and the unique Pumping Station. Our second stop will be Trojan Technologies for a tour of their R&D facilities that include the microbiology lab and environmental contaminants pilot lab. A bus will leave from the London Convention Centre at 1:00 p.m. and return by 3:30 p.m. Pre-registration for the tour as part of your conference registration is required. London Transit will provide transportation. Space is limited and will be on a first come, first served basis. The tour will not be cancelled due to weather, so dress appropriately – safety shoes/boots are required at the Adelaide PCP. For more information, please contact Carrie Brunet at 905-685-4225 x3767 or e-mail carrie.brunet@regional.niagara.on.ca regarding the Professional Wastewater Operator (PWO) Technical Session and Tour.

2007 CONFERENCE TECHNICAL

The 2007 conference technical program includes papers on all aspects of wastewater treatment, from watershed management, collections and stormwater systems, plant operations and biosolids management. This year we will have speakers from consultants, equipment suppliers, municipalities, and government officials including a strong New Professionals session. The program features a combination of half day and full day sessions including new focus specific sessions on Membrane Bioreactors, Contaminants of Emerging Concern, Asset Management and the return of the Public Education and Government Affairs session. The technical committees of the WEAO have worked hard to bring you an interesting and informative conference program.

MONDAY APRIL 16TH, 2007

COLLECTION SYSTEMS PART A
10:00 – 12:00 SESSION 1
Do you have collection system challenges associated with CSO’s, SSO’s, basement flooding, surcharge conditions, odour and corrosion, and aging infrastructure? If you do, you are not alone. This is the first of a two-part session being presented by the WEAO Wastewater Collection Systems Committee. In this session you will see case studies on how a number of collection system owners are addressing system deficiencies through modeling, investigation, pilot testing, benchmarking, and investment/management programs.

BIOLOGICAL TREATMENT PART A
10:00 – 12:00 SESSION 2
The morning biological session will cover innovations in both fixed film hybrid and biological nutrient removal (BNR) processes. The fixed film presentations include the start up and operation of the largest biological aerated filter (BAF) installation in North America at Thunder Bay, and a pilot study using a Moving Bed Bio-reactor (MBBR) at Brockville. Both systems...
were designed for CBOD and Ammonia reduction. The BNR presentations include computer modeling and pilot testing of two BNR systems at North Perth (Listowel) and the design and operating results from the largest biological phosphorous removal (BPR) plant in Ontario at Sault Ste Marie.

3 ADVANCED TREATMENT
10:00 – 12:00 SESSION 3
The Advanced Treatment session will present papers on a variety of topics including the use of Membrane technology for advanced wastewater effluent treatment, monitoring equipment for rapid and accurate measurement of the concentration and health of living biomass in wastewater treatment systems and a comparison of traditional mechanical thickening versus membrane filtration of biosolids in a municipal wastewater treatment plant setting.

4 PUBLIC AND GOVERNMENT AFFAIRS AND INNOVATIVE MUNICIPAL BUSINESS MANAGEMENT STRATEGIES
10:00 – 12:00 SESSION 4
The 2007 conference marks the return of public and government affairs issues integrated with municipal management strategies and implementation case studies. With today’s regulatory environment and increasing public interest and knowledge of water/wastewater operations and issues, municipalities are often faced with unique challenges. This session will examine case studies and solutions that municipalities have employed to meet regulatory requirements while still addressing the concerns of the public and fostering the promotion of new ideas to the water environment community as a whole.

5 COLLECTION SYSTEMS PART B
2:15 – 5:15 SESSION 5
This is a continuation of a two-part session. The afternoon session will present additional case studies on how a number of collection system owners are facing system deficiencies with CSO’s, SSO’s, basement flooding, surcharge conditions, odour and corrosion, and aging infrastructure and how they are dealing with these problems through modeling, investigation, pilot testing, benchmarking and investment/management programs.

6 MEMBRANE BIOREACTORS
2:15 – 5:15 SESSION 6
Do not miss an opportunity to attend the first specialized session on Membrane Bioreactor (MBR) technology in the history of WEAO Technical Symposiums. This session will focus on membrane bioreactor technology for enhanced biological nutrient removal, the retrofitting of MBRs at WWTPs, and pilot testing of MBR technology to support the potential implementation at plants as big as 600 MLD. Also, the results of the unique ‘side by side’ pilot testing of five MBRs conducted in the US will be presented.

7 ODOUR CONTROL, PRIMARY TREATMENT
2:15 – 5:15 SESSION 7
The understanding and control of nuisance odours in sewage treatment continues to be a challenge from both a design and operational standpoint. This session discusses topics of theory, research and available technologies for odour control, and presents case studies of how various sized municipalities have addressed odour concerns in dealing with plants and collection systems. This session will also discuss headworks upgrades for receiving hauled waste in a small municipal plant and screening upgrades at one of the largest wastewater plants in Ontario.

8 NEW PROFESSIONALS
2:15 – 5:15 SESSION 8
The New Professionals Committee would like to invite students, new professionals and industry experts alike to attend the New Professionals Session for an afternoon of informative and technical presentations prepared by the new generation of industry professionals. Technical papers presented in this session will draw from a host of industry related issues including control of activated sludge bulking and foaming, hydraulic design concepts, design and construction of equalization tanks, the use of ORP for BNR systems and asset management for ISO 9000 wastewater treatment plants.
TUESDAY
APRIL 17TH, 2007

UTILITY
MANAGEMENT
8:30 – 11:30 SESSION 9
The utility industry has undergone significant changes over the
last decade. In order to keep pace municipalities have had to employ
progressive strategies to address infrastructure planning and main-
tenance issues. This session will discuss management techniques and
tools including time and materials contracts, O&M manual develop-
ment in the 21st century, wastewater design guidelines and standards,
extreme makeover for maintenance managers and an examination of
sustainability indicators in the water sector.

BIOSOLIDS
MANAGEMENT PART A
8:30 – 11:30 SESSION 10
The management of the organic residual from wastewater treatment
continues to be a high priority for both design engineers and operations
personnel. The morning session will present important information and
discussions related to both emerging regulations and scientific study.

NEW TECHNOLOGIES
AND RESEARCH
8:30 – 11:30 SESSION 11
Presentations in this session examine the characteristics of wastewater
sludge and mixed liquor with respect to impact on filterability through
membrane media and the recurrent issue of membrane fouling. Other
presentations relate to using ATP-based control to optimize biological
processes; measuring gas transfer in anaerobic reactors; and
using ultrasound as a pretreatment process prior to disinfection. All the
subjects include new and innovative approaches to some key wastewater
planning, study, and the implementa-
tion of advanced biosolids treatment
and technology. There will also be a
presentation by the winner of the 2007
Award for Exemplary Achievement in
Biosolids Management.

WATERSHED
MANAGEMENT AND
SMALL COMMUNITY ISSUES
8:30 – 11:30 SESSION 12
Small communities are often faced
with unique wastewater situations
that require individual solutions.
This session will examine some of
the engineering solutions that have
been employed by small communities
for leveraging SCADA with remote
monitoring control for safe un-manned
operation, pulp and paper mill BOD
loadings based on an assimilative
capacity, using a constructed wetland
to remove nutrients from leachate
impacted stormwater, a review of
alternate sewage collection systems
and a review of one of the more successful
municipal treatment wetland systems.

ASSET
MANAGEMENT
1:30 – 3:30 SESSION 13
This session will focus on asset manage-
ment techniques and tools for
infrastructure capital planning and
maintenance, infrastructure optimi-
ization through technology improve-
ments and optimization, life cycle cost
analysis, and other topics of critical
importance to managing our capital
resources. Both theory and case studies
will be presented with the objective of
transferring knowledge that can readily
applied to our everyday activities.

BIOSOLIDS
MANAGEMENT PART B
1:30 – 3:30 SESSION 14
This session will build upon the informa-
tion and discussions presented in
the morning, and will present several
examples of biosolids management

STORMWATER
MANAGEMENT
1:30 – 3:30 SESSION 15
This is the first ever session being
presented by the WEAO Stormwater
and Watershed Issues Sub-committee.
With today’s regulatory environment
and focus being shifted away from point
source pollution to a broader water-
shed based approach to environmental
management, the impacts of waste-
water effluent, stormwater and CSO’s
on water quality has taken on greater
importance. In this session you will see
case studies on how these issues are
being addressed through modeling, pilot
testing, benchmarking, and investment/
management programs.
SPECIAL THANKS TO OUR SPONSORS

PLATINUM SPONSOR

GOLD SPONSORS

SILVER SPONSORS

R.V. Anderson Associates Limited

Kemira

TROJAN UV

Veolia Water

CH2M HILL

Terratec Environmental Ltd.
CONFERENCE AT A GLANCE

SUNDAY
APRIL 15TH, 2007

2:00 p.m. - 7:00 p.m.  Conference Registration
1:00 p.m. - 3:30 p.m.  PWO Plant Tour
4:00 p.m. - 6:00 p.m.  WEAO AGM Meeting
6:00 p.m. - 7:00 p.m.  New Professionals Reception
7:00 p.m. - 10:00 p.m. Ice Breaker Reception

MONDAY
APRIL 16TH, 2007

8:00 a.m. - 4:00 p.m.  Conference Registration

MORNING SESSIONS

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 - 8:30</td>
<td>Coffee</td>
</tr>
<tr>
<td>8:30 - 9:30</td>
<td>Opening Addresses</td>
</tr>
<tr>
<td>9:30 - 10:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>10:00 - 12:00</td>
<td>Technical Sessions 1, 2, 3, 4</td>
</tr>
</tbody>
</table>

AFTERNOON SESSIONS

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 - 2:00</td>
<td>Awards Luncheon</td>
</tr>
<tr>
<td>2:15 - 3:45</td>
<td>Technical Sessions 5, 6, 7, 8</td>
</tr>
<tr>
<td>3:45 - 4:15</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>4:15 - 5:15</td>
<td>Technical Sessions 5, 6, 7, 8 cont’d.</td>
</tr>
<tr>
<td>10:00 a.m. - 12:00 p.m.</td>
<td>PWO Technical Sessions</td>
</tr>
<tr>
<td></td>
<td>(CEU’s-availability to be confirmed)</td>
</tr>
<tr>
<td>2:15 p.m. - 4:00 p.m.</td>
<td>Process Control Exam</td>
</tr>
<tr>
<td>4:00 p.m. - 5:00 p.m.</td>
<td>PWO Meet and Greet</td>
</tr>
<tr>
<td>2:00 p.m. - 7:00 p.m.</td>
<td>OPCEA Exhibition</td>
</tr>
<tr>
<td>5:00 p.m. - 7:00 p.m.</td>
<td>OPCEA Reception</td>
</tr>
</tbody>
</table>

TUESDAY
APRIL 17TH, 2007

8:00 a.m. - 1:00 p.m.  Conference Registration

MORNING SESSIONS

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 - 8:30</td>
<td>Coffee</td>
</tr>
<tr>
<td>8:30 - 10:00</td>
<td>Technical Sessions 9, 10, 11, 12</td>
</tr>
<tr>
<td>10:00 - 10:30</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>10:30 - 11:30</td>
<td>Technical Sessions 9, 10, 11, 12 Cont’d</td>
</tr>
</tbody>
</table>

AFTERNOON SESSIONS

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 - 1:30</td>
<td>Boxed Lunch</td>
</tr>
<tr>
<td>1:30 - 3:30</td>
<td>Technical Sessions 13, 14, 15, 16</td>
</tr>
<tr>
<td>3:00 - 3:30</td>
<td>Operations Challenge Awards</td>
</tr>
<tr>
<td>3:30 - 4:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>9:00 a.m. - 3:00 p.m.</td>
<td>Operations Challenge</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>OETC Examination</td>
</tr>
<tr>
<td>4:00 p.m. - 5:00 p.m.</td>
<td>Totally Wasted Game Show</td>
</tr>
<tr>
<td>9:00 a.m. - 4:00 p.m.</td>
<td>OPCEA Exhibition</td>
</tr>
</tbody>
</table>

CONFERENCE BANQUET

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:30 p.m. - 6:30 p.m.</td>
<td>Cocktails</td>
</tr>
<tr>
<td>6:30 p.m. - 9:00 p.m.</td>
<td>Banquet</td>
</tr>
</tbody>
</table>
COMMITEE MEMBERS
2007 CONFERENCE

John Levie  
Chair  
ASI Group Limited

John Duong  
Past Chair  
Region of Halton

Ian McIvorham  
Technical Program / Board Liaison  
Region of Durham

Neil Awde  
New Professionals Program  
Earth Tech Canada Inc.

Janice Patterson  
Budget  
CH2M HILL

Darla Campbell  
Proceedings Compilation and CD  
amonavi Consulting Group Inc.

Ryan Connor  
Lunch & Banquet Programs  
CH2M HILL

Debbie Crane  
Guest Program

Paul Dagenais  
Audio / Video  
KMK Consultants Limited

Ugo DeCandido  
Entertainment / Charity Draw  
City of London

Dan Desbiens  
Conference Program / Signs & Banners  
Stealth Valve & Controls Ltd.

Heinz Held  
Advisor / Speaker’s Gifts  
SEW-Eurodrive Company of Canada Ltd.

Gary Burrows  
Ops Challenge, PWO Program, TWGS  
City of London

Dean Whittaker  
Local Arrangements  
KMK Consultants Limited

Yvonne Mackwood  
Sponsorship  
Westin Engineering

Dave Evans  
Marketing / Media  
R. V. Anderson Associates Ltd.

Wayne Harrison  
OPCEA Exhibition  
Siemens Water Technologies Canada Inc.

Rob Anderson  
OPCEA Exhibition  
H2Flow Equipment Inc.

Julie Vincent  
Executive Administrator  
Water Environment Association of Ontario

Carrie Vincent  
Administrative Assistant  
Water Environment Association of Ontario

Richard Todd  
Sponsorship  
City of London

CONFERENCE REGISTRATION

For all the Conference information at a glance, visit our website at www.weao.org. To register, please fill out and return the accompanying registration form. You can also register for the Conference on-line. Try it out and let us know if you have any difficulties. When you visit the website for the Annual Conference information, make sure you check out the rest of the site. If you want to receive future information, be sure to register your email address by following the instructions on the home page. See you at the London Convention Centre in London, Ontario.

The Association is the authoritative information source for water and wastewater treatment issues and technology. WEAO’s 1,200 members come from governments, universities, industries, consulting firms, equipment suppliers, contractors, and wastewater collection/treatment personnel. For conference information, contact WEAO, P.O. Box 176, Milton, Ontario, L9T 4N9, Phone 416-410-6933, email julie.vincent@weao.org or visit www.weao.org.

The Ontario Pollution Control Equipment Association is a non-profit organization dedicated to assisting member companies in the promotion of their equipment and services. Originally founded in 1970, OPCEA has grown to more than 150 member companies whose specialized fields encompass a broad spectrum of equipment and services for the generalized air and water pollution prevention and control marketplace. For membership or exhibit information, call Kelly Madden 705-725-0917 or email opcea@opcea.com or visit www.opcea.com.

The Professional Wastewater Operators (PWO) is a membership segment acting as a committee of the WEAO. The primary goal of PWO is to enhance the recognition and professional development of the people whose work involves performing the hands-on management tasks needed to operate and maintain municipal and industrial wastewater collection and treatment facilities. For information or Operations Challenge team registration, contact Gary Burrows at 519-661-0350 or gburrows@london.ca
When You Need To Stir Things Up, Experts Agree The Smart Money Is On WILLO EMU Mixers.

HIGH-EFFICIENCY, LONG-LIFE MIXERS

There are cheaper mixers, but there are simply no better performing mixers. And, most certainly, there are zero mixers that last longer than WILLO EMU mixers. Frankly, in tough conditions and tough applications, a WILLO EMU mixer is, without question, your best mixer value—and we can prove it. Ask about our Try-Before-You-Buy Program.

WILLO EMU pumps and mixers. Always The Best Choice In The Long Run.

Toll Free: 866-476-0323 | www.wilo-emu-usa.com

Area WILLO EMU Representative:
ASL Roteq Ltd., Ontario  625-869-1233
OPCEA EXHIBITION 2007

LONDON CONVENTION CENTRE
GRAND BALLROOM

LIST OF EXHIBITORS (AT TIME OF PRESS)

ABB Inc
Abba Parts & Service
ACG Technology Ltd.
ACI Instrumentation Ltd.
Alfa Laval Inc.
Anachemia Science
Aqua Technical Sales Inc.
Aquatic Life
Archer Technical Equipment Inc.
ASL Roteq Ltd.
Aysix Technologies
Baycor Fibre Tech Inc.
BNW Valve Manufacturing Ltd.
Bristol Canada
C & M Environmental Technologies Inc.
Canadian Drives
Canadian Safety Equipment Inc.
Can-Am Instruments
Cancoppas Ltd.
CB Automation Inc.
Chemline Plastics
Claro Inc.
ClearTech
Clow Canada
Conval Equipment Ltd.
Dakins Engineering Group Ltd.
Directrik Inc.
Eimco Water Technologies
Engineered Air
ENV Treatment Systems Inc.
Envirocyn Ltd.
Environmental Science & Engineering
F.E. Myers
Flaval Equipment
Flowserv Canada Corp.
H2Flow Equipment Inc.
H2Flow Tanks & Systems
Hardie Industrial Services Inc.
Hayward Gordon Ltd.
Hollen Controls Ltd.
Hydro Logic
Environmental Inc.
Indachem Inc.
ITT Flygt
John Brooks Co. Ltd.
John Meunier
KGO Group Ltd.
KSB Pumps Inc.
Mabarex Inc.
MEP Drives Ltd.
Metcon Sales & Engineering Limited
Napior Reid Limited
National Process Equipment
New Valves
N-Viro Systems Canada Inc.
Parkson Corporation
Pencon Company
Performance Fluid Equipment Inc.
PJ Hannah Equipment Sales Corp.
Pro Aqua + Shadrack Inc.
Protectolite Inc.
RMS Enviro Solv Inc.
Rockwell Automation
Rotork Controls
Rudi Kovacko & Associates Inc.
Sanitherm Engineering Ltd.
SEW Eurodrive Company of Canada Limited
Siemens
SPD Sales Ltd.
Stealth Valve & Controls Ltd.
Sterling Power Systems
Summa Engineering Ltd.
Syntec Process Equipment Ltd.
Terratec Environmental Ltd.
Toromont CAT Power Systems
Trojan Technologies
Troy-Ontor Inc.
Vector Process Equipment Inc.
Vicitaulec
Vissers Sales Corp.
Waterloo Biofilter Systems Inc.
Weir Canada Inc.
Westech Industrial Ltd.
THE FOLLOWING PROFILES REPRESENT A NUMBER OF OUR CONFERENCE ISSUE ADVERTISERS/EXHIBITORS AT TIME OF PUBLICATION.

ABS CANADA
1401 Meyerside Drive, Unit 2
Mississauga, ON, L5T 1G8
Ph: 800-988-2610  Fax: 905-670-3709
abscanada@absgroup.com
www.absgroup.com

ABS is a world-leading manufacturer of submersible pumps, mixers and aerators. Combined with our service, monitoring and control functions, ABS offers a single source solution.

ACG TECHNOLOGY LTD.
131 Whitmore Rd., Unit 13
Woodbridge, ON L4L 6E4
Ph: 905-856-1414  Fax: 905-856-6401
sales@acgtechnology.com
www.acgtechnology.com

ACG Technology Ltd manufactures, distributes and represents equipment and services for water and wastewater treatment. For more than 25 years we have supplied solutions for municipal and industrial markets.

ANACHEMIA SCIENCE
6355 Millcreek Dr., Unit 65
Mississauga, ON L5N 2M2
Ph: 905-567-8292  Fax: 905-567-5939
Toronto@anachemia.com
www.anachemia.com

Anachemia Science manufacturers laboratory chemicals at our head office in Montreal and distributes a complete line of laboratory chemicals, supplies and instrumentation from six branches across Canada.

AQUATIC LIFE LTD.
24 Aberdeen Ave.
Box 39
Pinawa, MB R0E 1L0
Ph: 204-753-5270  Fax: 204-753-2082
aquatic@aquaticlife.ca
www.aquaticlife.ca

Aquatic Life Ltd provides water quality and level monitoring equipment including photometers, pressure transducers, multi parameter probes and online monitoring for drinking water and wastewater.

ASL ROTEQ LTD.
6355 Kennedy Rd., Unit 17
Mississauga, ON L5T 2L5
Ph: 905-565-2406  Fax: 905-565-2408
Jeff@asroteq.com
www.asroteq.com

Specialists in supply and service of pumps and mixers for water and wastewater industry. Fully qualified service centre supplying repair and field services, vibration analysis, laser alignment and training.

AVENSYS INC.
400 boul. Montpellier
Montreal, QC H4N 2G7
Ph: 888-965-4700  Fax: 905-564-6776
info@avensys.com
www.avensys.com

Avensys Solutions, a division of Avensys Inc., is an industry leader in providing environmental monitoring solutions for air, water and soil. Waste water samplers & flow meters, data acquisition & system integration.

C & M ENVIRONMENTAL TECHNOLOGIES INC.
Box 122
Midhurst, ON L0L 1X0
Ph: 705-725-9377  Fax: 705-725-8279
Info@cmeti.com
www.cmeti.com

Manufacturers’ representative for process treatment equipment: screens, washers/compactors, grit removal, screenings, circular/rectangular clarifiers, chain and flight collectors, fine/coarse bubble and mechanical aeration, IFAS systems, filters, digester covers/mixers, ATAD systems, screw conveyors, live bottom bins, silos, sludge thickeners, package treatment plants, UV disinfection, membrane systems, MBRs, tablet chlorinators.

CANCOPPAS LIMITED
2595 Dunwin Drive, Unit #2
Mississauga, ON L5L 3N9
Ph: 905-569-6246  Fax: 905-569-6244
controls@cancoppas.com
www.cancoppas.com

Aysix fluorescent dissolved oxygen monitors, total suspended solids, sludge blanket monitors, wastewater samplers, ChemScan nutrient analyzers, Flexim clamp-on ultrasonic flowmeters, Ohmart Vega level instruments.

CLEAR TECH
7480 Bath Rd
Mississauga, ON L4T 1T2
Ph: 800-387-7503  Fax: 888-281-8109
orders@cleartech.ca
www.cleartech.ca

Full service chemical and instrument supplier. Including Hach Instruments, Spencer Blowers, Atlantic UV, Grundfos Feed Systems, chlorine, Sodium Hypo, Activated Carbon, Coagulants, flocculants and more.
A New Level of Thinking

A new energy is flowing at DELCAN Water. We have always been at the forefront of providing government and corporate clients in Canada and around the world with the highest level of engineering expertise and services.

Now, DELCAN Water offers even broader capabilities with the establishment of DELCAN IWS (Intelligent Water Systems), which offers leading edge design and implementation of automation, network and information management systems; expertise that complements DELCAN Water's established reputation for engineering services. DELCAN Water also benefits from even greater global resources with our new alliance to DELCAN Water (DHV Netherlands). DHV is an international leader in water technologies having provided integrated solutions to over 1,000 plants worldwide.

Contact us today and learn more about how you can benefit from the new ideas that are flowing at DELCAN Water.
H2FLOW EQUIPMENT INC.
470 North Rivermede Rd #7
Concord, ON L4K 3R8
Ph: 905-660-9775 Fax: 905-660-9744
info@h2flow.com
www.h2flow.com


H2FLOW TANKS & SYSTEMS
470 North Rivermede Rd. #6
Concord, ON L4K 3R8
Ph: 905-660-0649 Fax: 905-660-9744
tanks@h2flow.com
www.h2flow.com

Suppliers and installers of PERMAS-TORE Glass-fused-to-Steel tanks and CONSERVATEK covers for water, wastewater, slurry and leachate storage, sludge digesters, aerobic and anaerobic reactors, clarifiers, etc.

ITT FLYGT
111 Romina Drive
Concord, ON L4K 4Z9
Ph: 905-760-7530 Fax: 905-760-7527
www.flygt.ca

ITT Flygt is the leading manufacturer and supplier of pumping and mixing solutions used in wastewater plants, sewage systems and numerous other applications.

JOHN BROOKS COMPANY LIMITED
1260 Kamato Rd
Mississauga, ON L4W 1Y1
Ph: 905-624-4200 Fax: 905-624-6379
info@johnbrooks.ca
www.fluidhandlingsolutions.com

Our products include spray nozzles liquid filtration products, pump sets and packages, and custom engineered systems. We are your prime source for sewage collection.

KENTAIN PRODUCTS LTD.
55 Howard Pl
Kitchener, ON N2K 2Z4
Ph: 519-576-0994 Fax: 519-576-0919
glen@kentain.com www.kentain.com

Manufacturer of flexible (bag type) PVC liners for portable water and chemical storage NSF-61 material suitable for alum and ferrouschloride.

KSB PUMPS INC.
5885 Kennedy Road
Mississauga, ON L4Z 2G3
Ph: 905-568-9200 Fax: 905-568-3740
ksbcanada@ksbcanada.com
www.ksb.ca

The Canadian subsidiary of the international KSB Group and provides engineered pump and mixer solutions for municipal and industrial water and wastewater treatment systems. Principals/Trade Names Represented: Amarex KRT, Sewatec, Amamix, Amaprop, Amaline, Amacan, Omega, Multitec.

P.J. HANNAH EQUIPMENT SALES CORP.
151 Brunel Rd, Unit 26
Mississauga, ON L4Z 2H6
Ph: 905-712-0620 Fax: 905-712-1240
bhhomebrook@pjannah.com
www.pjannah.com

RBC packaged treatment plants, netting systems, tertiary filtration systems, baffle curtains, pond/containment liners, mechanical bar screens, grit collectors, screw conveyors, sludge collecting/compacting equipment.

PARKSON CORPORATION
205 – 1000 St-Jean
Pointe-Claire, QC H9R 3P1
Ph: 514-636-8712 Fax: 514-636-9718
Canada@parkson.com
www.parkson.com

Aeration, biological, clarification, conveying, dewatering, filtration, grit management, oil/water separation, screening, screenings washing/conveying/compacting, scum skimming, sludge handling, sludge drying, sludge removal, sludge thickening, stormwater management.

PRO AQUA + SHADRACK INC.
512 King Street East, Suite 320
Toronto, ON M5A 1M1
Ph: 416-861-0237 Fax: 416-861-9303
gcoate@idirect.ca
www.proaqua-shadrack.com

Products/Services: Pro Aqua + Shadrack Inc. is a supplier of a complete line of market leading products for water and wastewater treatment. Plant retrofits, mechanical refurbishments and spare parts for all products are also available. Principles/Trade Names: Principles represented include Calgon Carbon, Chlor- tainer, Grande Water, Miox, Hallsten, HIS, ML, Dresser Roots Salness, Sanitaire, Schwing, Underground Solutions, US Filter and Zenon Environmental.

R.M.S. ENVIRO SOLV. INC.
36 Norbett Dr., Unit 2
Gormley, ON L0H 7G0
Ph: 905-841-7938 Fax: 905-841-9855
Thomas@rmsenviro.com
www.rmsenviro.com

RMS Enviro Solv. is a pumping solutions provider. Serving clients in the infrastructure, municipal and industrial sectors we design systems for pumping and dewatering, rent and sell equipment and provide installation services. RMS represents Godwin Pumps, Pithbull Pumps and Dragflow, Supavac and Solids Dewatering Containers.

SANITHERM ENGINEERING LIMITED
Suite 100, 340 Brookshank Ave
North Vancouver, BC V2J 2C1
Ph: 604-986-9168 Fax: 604-986-5377
saneng@sanitherm.com
www.sanitherm.com

SEW EURODRIVE COMPANY OF CANADA LTD.
210 Walker Drive
Bramalea, ON L6T 3W1
Ph: 905-791-1553 Fax: 905-791-2999
www.sew-euodrive.ca

Gearmotors, Brake Motors, Gear Reducers, AC Inverters, Torque Control your complete power transmission solution center.
SIMPSON ENVIRONMENTAL CORPORATION
5035 North Service Rd., A10
Burlington, ON L7L 3V2
Ph: 905-332-7669 Fax: 905-332-7502
dcooper@simpsonenvironmental.com
www.simpsonenvironmental.com

Volute dewatering screw press for all types of wastewater, high efficiency, low power, low operating cost and non-clogging unattended operation based on patented design. No thickening needed. Biosolids management. Ozone systems.

SPD SALES LTD.
6467 Northam Drive
Mississauga, ON L4V 1J2
Ph: 905-678-2882 Fax: 905-293-9774
www.spdsales.com

SPD supplies process control instrumentation and chemical feed products to industries and municipalities. We offer full technical application, instrument calibration, and quality products and support.

SUMMA ENGINEERING LTD.
6423 Northam Dr
Mississauga, ON L4V 1J2
Ph: 905-678-3388 Fax: 905-678-0444
info@summaeng.com
www.summaeng.com

Summa Engineering Ltd. has been in continuous operation for over 25 years and is extensively involved in instrumentation and SCADA projects providing quality goods and services to the Industrial and Municipal Markets throughout Ontario and Canada. Summa has extensive knowledge and experience in the water and wastewater processes.

TERRATEC ENVIRONMENTAL LTD.
200 East Port Blvd.
Hamilton, ON L8M 7S4
Ph: 905-544-0444 Fax: 905-544-0266
Rschootens@amwater.com
www.amwater.com

Terratec is Ontario’s leader for handling and beneficial reuse of municipal biosolids, providing full scale programs, digester, lagoons and tank cleaning, dredging mobile dewatering, etc.

VECTOR PROCESS EQUIPMENT INC.
5889 Summerside Dr.
Mississauga, ON L5M 6L1
Ph: 416-527-4396 Fax: 905-367-8390
info@vectorprocess.com
www.vectorprocess.com

Bar screens, clarifiers, surface aerators, digester covers, mixers, heat exchangers, sludge dewatering, sand filters, phosphorous removal, grinders, pumps, polymer make down systems, chemical feed skids.

WATERLOO BIOFILTER SYSTEMS INC.
Box 400, Rockwood, ON N0B 2K0
Ph: 519-856-0757 Fax: 519-856-0759
info@waterloo-biofilter.com
www.waterloo-biofilter.com

On-site treatment of residential, commercial and communal sewage wastewaters, fully scalable from single residence to more than 200,000 L/day. Small footprint, low energy usage and no sludge production.
IT IS NOT REALLY SO FAR-FETCHED when you think of it – five separate events run against the clock, during which teamwork, skill and knowledge are all necessary to emerge victorious. As well, there is a certain amount of pressure to be overcome – it is mostly done in full view of those attending the Water Environment Association of Ontario’s 36th Annual Conference. In the wastewater industry, we take a certain amount of pride in doing things well, and there is no doubt that those competing exemplify that tradition. Why not join us? Here is an overview of what to expect.

The Operations Challenge will take place on Monday, April 16 and Tuesday, April 17 during the WEAO Conference in London, Ontario. The Process event will be the first of five events to be run, and the only event held on Monday. This is the only event held without a live audience in attendance – and that is only out of due consideration for the competitors. The level of concentration required is extreme – imagine writing a full certification exam in only 30 minutes, with bonus points if you finish early. Not only that, but some questions are situational operations problems (e.g., why is my process failing; and correctly diagnose the problem in under two minutes please!) which require consensus to be reached very quickly among team members. We do request that all disagreements be settled verbally and quietly at that.
After the **Process** event is over, participants have a brief opportunity to swap stories and get to know each other at the **Meet and Greet**. The respite is temporary, however, as all are aware that the remaining four events are still to come. All of Tuesday’s events are set up in Ballrooms 1 and 8 at the Convention Center. Teams can expect to run two events before lunch, with the remaining two competitions scheduled after lunch. The exact order of events for each team is determined by a draw held after the Process event.

The **Collection** event is an audience favorite, and that is not always because of what the competitors do. The event involves cutting into two lengths of pipe, fabricating a 100mm sewer service connection from one of the cut out pieces, and placing that back into the pipe it was not cut from in the first place. In case that is not challenging enough, maybe install a sampler or flowmeter in the other pipe while you are at it… and make the connections water tight… and we will have water flowing through one pipe throughout – just to keep things interesting. By the way, all of the above has been done in less than two minutes, with no leaks. What keeps the audience coming back is the expectation that, every few years, the judges will blow the ends off the pipe during the pressure test – no danger (except perhaps to the judge’s pride), but highly entertaining to watch.

The **Safety** event is a demonstration of a confined space rescue. Our over-60-kilogram personikin is placed underneath an elevated platform that has a manhole through which the rescue team must winch him to safety. Teams have to set up a tripod on the platform, test the atmosphere, vent the confined space, lower a two-person recovery team, attach a harness and rope to the ‘victim,’ and carefully raise him to the platform. All equipment has to then be put away, and the rescued one given a (simulated) shower. This event is a treat to watch – the speed, skill and attention to detail displayed by the competitors is inspiring, as is their ability to overcome obstacles during the event. As you can imagine, with so much happening at once, things rarely happen as planned – sort of like a real rescue situation, right?

The **Pump Maintenance** event is centered about ‘Le Grande Orange’. Not Rusty Staub of the Montreal Expos, but a four-inch Godwin pump painted in that distinctive colour. Teams have to prepare a diesel-driven, trailer-mounted pump for lift station service after a sewage pump failure at a lift station. Oil is changed, fuel and oil filters are changed, the pump given a comprehensive PM service, float controls are added to the lift station, and, finally, the pump is hooked up, ready for action. Those are only a few of the tasks; the official event rules involve some 41 steps!

Our success in wastewater treatment is measured in many ways. Certainly, job satisfaction is
one way, but the most common indication of success in our industry happens in the lab. The Laboratory event stresses skill and teamwork – not to mention precision and fine motor control. “Oops” is not a word you want to hear during this event. Teams have to perform all the steps of a BOD analysis using equipment following all method requirements as outlined in the Standard Methods with some modifications – all from memory. The event is completed when all tasks have been finished and the team captain hands in the worksheet to the lead judge. Winning requires steady nerves, good technique and intense concentration on the task at hand.

So, what about you, your employer and the people you work with? Do you want an unparalleled opportunity to demonstrate your skill and involvement in the industry? How about a chance to meet great people and build up a sense of community? Enter the competition.

Your professional life is not just about what happens at the plant or in the office – the Operations Challenge is a prime example of what real professional development is all about.

That is a brief overview of the competition. For details, contact the Operations Committee chair, Gary Burrows at (519) 661-0350 or gburrows@london.ca, or check out the web site for information and updated procedures http://www.weao.org/committees/Operations_Challenge/Operations_Challenge.html

By the way, the teams that finish in first or second place are eligible to compete in the Water Environment Federation’s Operations Challenge competition held in San Diego, California in October 2007. We hope to see you there!

Gary Burrows, City of London
Flexible Solutions for Clarification.

The AquaDAF® Clarifier High-Rate Dissolved Air Flotation System is a hybrid system which is highly effective for treatment of a wide range of raw water characteristics including troublesome waters exhibiting low turbidity, high TOC, color & algae.

Advantages of the AquaDAF System:
- Optimal removal of low-density particles
- Unequilibrated loading rates
- Polymer-free membrane pretreatment
- Small footprint

Infilco

HEADWORKS
BIOLOGY
SEPARATION
MEMBRANE
DISINFECTION
BIOSOLIDS
SYSTEMS

Degremont Technologies

INFILOCO DEGREMONT, INC. 8007 DISCOVERY DRIVE, RICHMOND, VIRGINIA 23229 (800) 446-1150
WWW.INFILOCODEGREMONT.COM
INTERNAL AFFAIRS

LEAVING FOR ABU DHABI

Dave Hein recently decided to leave the country for someplace slightly warmer. He has accepted a multi-year contract to work in the United Arab Emirates, working on a very large infrastructure project.

Yes, just the thought of shoveling snow one more time must have prompted this.

David was a very productive volunteer for the Water Environment Association of Ontario (WEAO), having served in various roles including historian, committee chair, director, and president of our organization. He was a visible constant at many of the WEAO functions such as the WEFTEC icebreaker and golf tournament, events that he helped organize and run.

Lynn Hein, David’s wife, also pitched in and helped us on many occasions. She was a very capable associate organizer of the Guest Program for the WEAO Annual Conference, and was routinely a pleasant part of many of the WEAO activities. She also took great pride in her fund raising abilities for Water for People Canada.

We want to thank David and Lynn for all the years of dedication to our organization. We will miss them both and sincerely hope they will stay in touch. We all hope to see them again soon.

Michael Albanese
Chair of Special Events Committee
H2Flow Equipment Inc.

CWWA REPORT:
WINDOWS ON OTTAWA (2006) UPDATE

The mid-November CWWA’s 2006 Window on Ottawa involved over 90 senior municipal officials from 42 municipalities at the event. Federal and national officials presented information on new or emerging policies, programs or regulations directly to municipal officials. Participants were able to provide input, question and comment on the initiatives. The event was a unique opportunity to meet CWWA Board members and the chairs of the CWWA Technical Committees.

The event focus was on water and wastewater utility security, the Canadian Council of Ministers of the Environment (CCME) Long-term Municipal Wastewater Effluent Strategy (MWWE) (now undergoing regional meetings hosted by the jurisdictions), the draft CCME Municipal Sewer Use By-Law, potential Canadian Environmental Protection Act (CEPA) instruments to support the MWWE Strategy, reviews of current regulatory initiatives – Fertilizer Regulations and the National Pollutant Release Inventory, the role of the federal government in fresh water quality management, the Parliamentary Review of CEPA 1999, the microbial source tracking project of Health Canada and Environment Canada, plans for new Drinking Water Parameters in 2007, pandemic planning for utilities, and the projected impacts of climate change.

The schedule was very full, but provided outstanding opportunities for municipalities to learn about these national and federal initiatives. Members should plan on attending the 2007 Window usually held in late fall in Ottawa each year. Watch for event information on the CWWA website, www.cwwa.ca.

Cindy Toth, Town of Oakville

Upcoming Event:
MARKET LEADING PRODUCTS FOR WATER AND WASTEWATER TREATMENT

Screening
- Mechanical Bar Screens (Fine / Coarse)
- Climbing, Step & Rotary Screens
- Travelling Water Screens
- Screw Screens / Septage Receiving
- Shafted / Shaftless Screw Conveyors
- Compactors/Presses/Washers

Grit Removal Equipment
- Grit Removal, Vortex Separation, Classification and Conveying

Clarification
- Circular and Rectangular
- Primary/Secondary / Flocculation
- Tube and Plate Settlers
- Sludge Thickening / Scum Removal
- SS / Plastic / CS / Vertical Loop Chain

Aeration
- Fine / Coarse Bubble
- Channel Aeration / Aerobic Digestion
- Gas Cleaning for Ceramic Diffusers
- Mechanical Aeration
- Brush Aeration / RBCs
- Jet Aeration / Mixing
- Oral
- Nitrification & Denitrification
- IFAS – Attached Media

Odour Control
- Conventional Packed Towers
- Biofilters
- Activated Carbon

CSO and Stormwater Control
- Tank & Sewer Flushing
- Overflow Screening / Control
- Flow Regulation / Sluice Gates
- Stormwater Pumping Stations

Chemical Feed & Storage

Filter Systems
- Travelling Bridge / Gravity Filters
- Filter Underdrains

Membrane Systems for Water/Wastewater
- Potable Drinking Water (Giardia / Cryptosporidium Removal)
- Membrane Batch Reactors for Wastewater

Ultraviolet Disinfection
- Potable Drinking Water Disinfection
- Wastewater

Anaerobic Sludge Digestion
- Heat Exchangers
- Digester Roofs & Mixing
- Gas Safety Equipment
- ATAD

Sludge Dewatering
- Centrifuges
- Belt Presses / Gravity Belt Thickeners
- Membrane / Plate & Frame Presses
- Rotary Presses / Thickeners
- Sludge Dryers

Sludge Cake Storage and Transport
- Sludge Cake Pumps
- Shafted/Shaftless Screw Conveyors
- Truck Loading / Receiving Stations
- Storage Hoppers / Silos / Bunkers
- Storage Discharge Systems (Sliding Frames and Gravity Discharge Systems)

Sludge Disposal
- Cannibal “no sludge” Process
- Fluid Bed & Multi-Hearth Incineration
- Class “A” Bioset Sludge Stabilization Process

Pumping Systems
- Open / Enclosed Archimedes Screw Pumps
- Submersible Pumps / Mixers
- Grit Pumps
- Axial Flow Pumps
- Screenings Pumps

Package Plants for Water and Wastewater

Sequencing Batch Reactors
- Decanters

Plant Retrofits / Mechanical Refurbishments and Spare Parts for all Products

---

[Logos of various companies associated with water and wastewater treatment]
On November 8, 2006, the Ministry of the Environment invited the WEAO to attend a special one-day conference titled Solutions Through Innovation. The program was designed to offer attendees a chance to learn about the innovative work taking place within the Ministry and particularly at the MOE lab building on Resources Road. Frankly, it was exciting to tour the hallways and labs in a facility that some years back had seemed to be more like a ghost town. Laboratories are now bustling with activity and advanced equipment has been brought in to aid the Ministry in its functions. One of these advanced technical resources is a Time of Flight Fourier Transform Mass Spectrometer that is able to resolve chemicals to within the mass of an electron. It presents the Ministry the ability to respond in a spill emergency in hours not days, thereby enhancing its effectiveness in preventing a spill to a water course from impacting the safety of downstream water supplies.

The event consisted of a series of speeches by people involved in innovation, both within the MOE and other institutions. These were interspersed with tours of labs, and tabletop displays of current MOE research projects. Lab tours included the air quality bus, the aquatic toxicology lab, the GIS centre, the PCR section of the Microbiology lab and the Mass Spectroscopy lab. Approximately 30 tabletop displays highlighted some of the innovative work going on in Ontario in the environmental field. Several of the projects would be familiar to WEAO members, including the research on Moving Bed Bio-Reactors (MBBRs) for ammonia removal, and the solar drying process for biosolids treatment being implemented in Niagara (part of Niagara Region’s award winning biosolids management program). Other topics ranged from advanced analytical techniques, information management, and environmental monitoring programs, to science communication and youth outreach programs.

In addition to addresses by senior MOE staff, including the Deputy Minister (Paavo Kivisto), Assistant Deputy Minister (Carl Griffith) and Director Environmental Monitoring and Reporting (Ed Piché), there were addresses from other ministries and institutions that have some connection to research and innovation in Ontario. Suzanne Corbeil from the Canada Foundation for Innovation (CFI) provided an overview of the CFI’s role in promoting institutional research. The CFI is an independent corporation created by the federal government in 1997 and entrusted with over CDN$3.6 billion to invest in research infrastructure such as university and research hospital laboratories. Their funding has supported many research chairs and facilities related to environmental research across Canada.

Dr Alastair Glass, the first Deputy Minister for the new Ontario Ministry of Research and Innovation (MRI), shared his vision of fostering a culture of innovation and excellence in Ontario. He highlighted the fact that, in a number of key indicators such as patent applications, Ontario and Canada lag behind the US and many European nations. This emphasizes the need for Ontario to generate more resources in the research field to retain our ‘best brains,’ develop the research and then help industry to bring the research to market, which would be a boost to the economy.

At the end of the day, participants generally agreed that the Ministry should consider doing this on a regular basis.

Mark Rupke, City of Toronto
In Memoriam.

George B. Crawford, P. Eng., the former President and Chairman of the Board of Gore & Storrie Limited, passed away on January 22, 2007.

George graduated from the University of Toronto with a degree in Civil Engineering in 1944. After service with the Royal Canadian Engineers, he joined Gore & Storrie Consulting Engineers in 1945 and rose to become President in 1975.

George’s long and storied career as a sanitary engineer included projects across Canada, and he played a key role in the development of the Main Toronto sewage treatment plant at Ashbridges Bay. George received many awards and honours, was inducted into the University of Toronto Engineering Alumni Hall of Distinction, and was only the second Canadian to be made an Honourary Member of the Water Environment Federation. He was also a proud SS member. George was a model of integrity, civility, responsibility, and service to the community. Heartfelt condolences are extended to his wife of 61 years, Ruth, as well as to the entire Crawford family.

It is with sadness that we note the passing of Stewart Field on November 4, 2006 at the age of 49. Stewart worked for the City of Toronto for 25 years, and had recently accepted employment with the Region of Durham. Stewart had a natural affinity for both people and electronic equipment, and was instrumental in getting the process control system at the Ashbridges Bay WPCP operating successfully. Stewart was involved in the WEAO Operations Challenge as a scorekeeper, and frequently was called upon by friends to tame their computer gremlins – which he did with unfailing good humour and remarkable success. He will be missed.
n November 28, 2006, a cold and bleak late autumn day, a group made up of Board members, committee chairpersons, and past presidents gathered in Milton to take part in our Annual Strategic Planning Workshop. This year, the group was graced with the presence of WEF representative, Lori Jordan, who unveiled WEF’s Utility Partnership Program™ (more about this later).

The day commenced with a review of the Strategic Plan for 2003 to 2008, to assess the progress that had been achieved in addressing the goals and objectives of the Plan. The highlights of the Strategic Plan were as follows:

**Goals**
1. Strengthen resources
2. Professional development and training
3. Improve member services
4. Public education and outreach
5. Improve business operations

For each of these goals, a number of objectives were identified in the Plan as follows:

**Strengthen Resources**
- Hire additional support staff
- Retain existing members
- Recruit new members (wastewater operators, government, industrial)
- Obtain sponsorship of newsletter and events

**Professional Development and Training**
- Organize seminars and workshops
- Organize Annual Conference and Exhibition
- Conduct professional development workshops
- Formalize CEU process for learning events

**Improve Member Services**
- Create ‘Members Only’ area of the WEAO website
- Update membership survey
- Publish sewer rates study
- Expand special events activities
- Create a Calendar of Events

**Public Education and Outreach**
- Create new member services materials
- Sponsor Canadian Stockholm Junior Water Prize
- Make available Canadian water source books
- Promote student chapters
- Collaborate with other associations and government agencies
- Complete a marketing plan for the organization

**Improve Business Operations**
- Complete an annual review of the Strategic Plan
- Conduct an annual business planning process
- Maintain sufficient financial reserves
- Create operating procedures
- Complete an organizational and financial review
- Review the committee structure

Amazingly, the review of the current five-year Strategic Plan revealed that significant progress had been made toward addressing many of the objectives contained in the Plan (witness the checkmarks). However, it was also recognized that, for a few of the objectives, progress to date had been disappointing and that considerable work remained to realize those objectives.

The workshop then turned to a brief review of the Marketing Plan that was completed in 2003. The Marketing Plan identified some key marketing initiatives for the WEAO which would help to address some of
the remaining objectives. These initiatives included:
- Marketing the benefits and value of membership
- Developing and implementing a strong visual and editorial identity program
- Serve as a technical resource in government activities.

It was agreed that, while the WEAO had made some progress in these key marketing areas, considerably more is needed to be done to achieve some of the remaining objectives such as: expanding recruitment of new members and collaborating with other associations and government agencies.

The group then reviewed the stated initiatives for the WEAO for 2006-07 which included:
- Initiating a WEAO scholarship program for students in environmental programs at universities and community colleges
- Increasing the number of student chapters
- Hiring an Executive Director for the WEAO
- Raising the profile of the Member Services Committee
- Initiating a program for recognizing in-kind services of member organizations
- Presenting a new membership model (in line with WEF’s model)

The group acknowledged that considerable progress was being made to complete the above initiatives, however, it was noted that there were several key barriers which would either impede or possibly prevent progress. The identified barriers included:
- Retirement of people in our industry
- Insufficient numbers of people entering our industry
- Ignorance of the value of membership
- Lack of volunteers
- Increase in workload

The first two barriers were identified and explored in some detail during the Strategic Planning Workshop of 2005. These barriers, as well as the third barrier, have contributed to the fourth barrier, i.e., insufficient numbers of volunteers on committees.

The issue of increasing workloads was seen as a two-pronged barrier. It was recognized that increasing business-related workloads left less time for volunteering. In addition, it was noted that, as the WEAO raised its profile and began to collaborate more with government agencies, and began to achieve its marketing goals, a greater workload would fall to the WEAO Board and committee members. It was to address these types of issues that the WEAO Board made the decision to hire an Executive Director, a person who could be the continuing face of the organization in dealings with governmental and non-governmental agencies and with other associations. News concerning our new Executive Director appears elsewhere in this issue.

The group then broke up into four working groups to brainstorm the challenges facing us as an organization and directions for future initiatives. The directions coming out of the
working groups may be summarized as follows (in no particular order):
- Conference and seminar fees should be increased and brought into line with those of similar events in the marketplace. The fees should reflect the high quality of the seminars and conference.
- Charities, such as Water for People and the scholarship fund, should be supported by revenues from special events.
- Employers need to be educated on the benefits of participation on committees and the Board and they need to be encouraged to free up their employees, including new professionals, to participate.
- Free WEAO memberships should be offered to newcomers to our industry (new operators, graduating students, new professionals from abroad).
- WEAO should strengthen its role in the promotion of sound science by identifying required research needs, helping with screening of research proposals, and serving as a conduit for research money.
- WEAO should serve as a resource for students to allow them to connect and to allow us to connect with them.
- Committee Chairpersons should connect more closely with each other. There needs to be greater linkages between committees.
- WEAO needs to identify our panel of experts who would provide timely technical information when needed.
- WEAO needs to do more succession planning in all key areas such as directors, committee chairs, and conference chair.
- WEAO needs to go farther in providing operator training and providing CEUs for accredited training. It was suggested that alternative training delivery methods be explored such as through suppliers and by way of webcasts (to provide cost-effective training particularly for operators in remote areas).

The need for the WEAO to strengthen our role in promoting sound science was stressed by several of the working groups. Clearly, there was a feeling expressed that the WEAO must not lose sight of its essential mandate to disseminate sound technical information on matters relating to the water environment.

Tony Petrucci, Past President of the WEAO and WEF Director, presented a brief overview of WEF’s key strategic initiatives in the areas of professional development, public education and outreach, advancement of water environment science and technology, broadening constituencies and new markets, and improving operations and member services. Interestingly, and perhaps not surprisingly, the issues facing WEF and the initiatives being considered to address the issues are very much like those being faced by the WEAO.

Following Tony’s presentation, Graham Simpson, Chair of the Member Services Committee, unveiled a draft of a promotional Powerpoint presentation which could be used by any member of the WEAO when addressing groups of people who want to learn about the WEAO and its goals and objectives. The presentation was favourably received and some initial comments were put forward for inclusion in future drafts.

The final session of the day was led by Lori Jordan, WEF’s Assistant Director of Association Services, who is responsible for membership marketing and customer service. Lori presented the WEF’s Utility Partnership Program™ which would permit corporate memberships for public utilities. We were given to understand that this program would be piloted in a small number of municipalities in the United States in 2007.

The key objectives of the program were:
- To provide a higher level of service to the utility;
- To grow membership in both the WEF and the Member Association (MA);
- To attract utility executives;
- To provide unique selling points that would differentiate the WEF/MA from other similar organizations.

It was noted that the program would be a voluntary one for MAs. The Utility Partnership Program™ is comprised of three elements. The first element entails providing tiered levels of membership for utilities based on existing WEF/MA membership categories with pricing based on ‘full cost’ without discounts. MA-only memberships are also available within this element.

The second element of the program involves a number of ‘Value Packages’ which are discounted, specially-designed packages of products and services which may include a combination of WEF and MA products and services. Examples of these packages include: an Executive Package, Water Environment Practice online, Water Environment Research online, a combination of WEP and WER online, a Training Package, a Library Builder (all MOPs), Conference discount package, and others. The number and type of ‘Value Packages’ offered to a utility may vary according to the utility’s membership tier (element 1).

The third element of the program is an Incentive to Add feature which allows utility members a certain number of additional memberships at no charge for people within their organization with the number of additional memberships varying with the tier level under element 1. At renewal time, the no-charge memberships would be billed at full price, however, the utility would have the option of adding more members at set discount rates.

The WEAO Board and the other workshop attendees heard Lori’s message with great interest. The Board will maintain a watching brief as the WEF pilots the program and rolls it out across all the MAs. The WEAO Board will be reviewing the proposed Utility Partnership Program™ and its potential implications on members as well as on the revenues of the WEAO. Ultimately, the program will have to be modified to serve the unique needs of our association.

The Strategic Planning Workshop was a resounding success due to the considerable contributions of all of the attendees. The WEAO Board extends sincere thanks to all of the workshop participants for their valuable input. Association members can rest assured that the outcomes of the meeting will provide directions for future initiatives in 2007-08 and beyond.

Peter Takaoka, P.Eng.,
R. V. Anderson Associates Limited
Moving Forward
Wastewater Biosolids Sustainability:
Technical, Managerial, and Public Synergy

Join an impressive selection of over 190 presentations with international speakers from 34 countries, including the United Nations, the World Health Organization and the World Bank.

View conference details and register online at www.iwabiosolidsmoncton2007.ca

Organized by:

Held jointly with:
4th Canadian Organic Residuals and Biosolids Management Conference
the Water Environment Research Foundation is a non-profit organization that helps utilities and corporations preserve the water environment and protect human health by providing science and technology research to enhance management of our water resources. The research is concentrated in six areas: Conveyance Systems, Infrastructure Management, Solids Treatment, Residuals & Reuse, Storm Water, Wastewater Treatment & Reuse and Watersheds & Water Quality.

Collection systems are addressed in three of these areas: Conveyance Systems, Infrastructure Management and Storm Water.

Research in the Conveyance Systems Program Area focuses on centralized and decentralized wastewater and storm water systems design, optimization, operations, and maintenance. Research also addresses system protection, evaluation, and rehabilitation. Recent projects include:

• 02-CTS-5, Methods for Cost-Effective Rehabilitation of Private Lateral Sewers: This report provides a road map to the assessment, analysis, program development, method selection and legal and financial implementation that will make it an easier task to decide how to implement lateral rehabilitation within an overall wastewater system rehabilitation strategy.

• 01-CTS-7, An Examination of Innovative Methods Used in the Inspection of Wastewater Systems: High-quality investigation and diagnosis is fundamental to the decision-making process and to the development of effective strategies for rehabilitation and replacement of our wastewater systems. This report provides a comprehensive review of the current state of the art of investigation technology for both gravity and force mains.

• 97-CTS-7, Development of a Tool to Prioritize Sewer Inspections (SCRAPS): This software tool helps users identify pipelines at risk of structural and operational failure. Called SCRAPS (Sewer Cataloging, Retrieval, and Prioritization System), the tool lets small- to medium-sized wastewater utilities estimate the probability and consequence of pipe failure.

Research in the Infrastructure Management Program (IMP) Area focuses on asset management, plant optimization, and security strategies, including early warning systems. While the focus in the Conveyance Area is inspection and rehabilitation, the focus in this area is management of assets.

For example, a recent IMP project 01-CTS-20-T, Effective Practices for Sanitary Sewer and Collection System Operations and Maintenance provides users with a toolkit of effective practices for the operation and maintenance, management, and capacity assurance of sanitary sewer collection systems.

Research in the Storm Water Program Area focuses on program monitoring and management, including best management practices and low impact development. Research also addresses source identification and control and receiving water effects. Rapid population growth, emerging contaminants, aging infrastructure, urbanization, and increased water quality concerns are some of the mounting pressures that are driving the need for a better understanding of storm water and its impact on human health and the environment.

The Conveyance Area looks at the conveyance of the flow while the Storm Water Area looks at how the flow is generated and what must be done to manage its impact on the environment. In other words, the inspection and rehabilitation of the storm sewer would be looked at in the Conveyance Area while the efficacy of storm water retention ponds would be investigated under Storm Water.

Recent work includes the development of a best management practice database, decentralized storm water control and benefits/risks of disinfection.

WERF works with other research organizations including UKWIR (United Kingdom Water Industry Research). UKWIR was set up by the UK water industry in 1993 to provide a framework for the procurement of a common research programme for UK water operators on ‘one voice’ issues. UKWIR’s members comprise 24 water and sewerage utilities in England, Wales, Scotland and Northern Ireland.
Two recent UKWIR projects on collection systems are:

- **Network and STW integration**: Undertaking a review of how companies operate network and WwTW in terms of management processes and information exchange between the two systems in order to establish current best practice. Reviewing modelling practices and assessing the risks and benefits that integrated management of systems provide now and where this may take us in the future. Included is an assessment of a simple system in a catchment. The project identifies how this information can be used practically to integrate operation & design including a review of technology which can be used to improve network data gathering and exchange with the wastewater treatment plant.

- **Performance of storm tanks and potential for improvement in overall storm management - Phase II**: Builds on work done in Phase I with a view to refining an improved methodology for storm tank design and operation. The researchers will review the different tank arrangements and their inlet and outlet arrangements that are currently operated by the UK Water Industry and select three rectangular and three circular tanks for fieldwork evaluation. A series of large-scale laboratory tests will be conducted to examine the impact of changes in inlet and outlet geometry and of the performance of surface and bed scraper mechanisms.

UKWIR and WERF are currently collaborating on a research project on Surface Water Source Control. This work extends the work done by both organizations in Sustainable Urban Drainage Systems (SUDS). The project will assess the long-term costs associated with SUDS and determine their effectiveness in helping stakeholders meet water quality standards and reduce the hydraulic impacts of storm water.

Patrick Coleman, Associated Engineering Ltd.

WERF is a non-profit organization that helps utilities and corporations preserve the water environment and protect human health.
A special feature of the seminar was CTV Queen’s Park reporter Paul Bliss and cameraman Jon Soyka providing the tough interview questions and review of the media interaction. Paul provided captivating stories and anecdotes regarding his career as a reporter and offered advice on how to handle an interview. On-camera interviews were professionally taped and Jon provided excellent commentaries on the significance of a good image.

It is very difficult to try to control an interview and understand that a journalist’s job is to get both sides of a story. However, to be a success, some techniques to help the media understand your position and to communicate your message need to be practiced. Participants also received a copy of the WEF Publication Survival Guide: Public Communications for Water Professionals.

Altogether, 20 participants attended the workshop, learned some skills and had fun with the media – at least this time.

George Bis, Biosolids Manager, Regional Municipality of Niagra
The latest in online measurement

The G::system
*Plug & Measure*
- entry level system
- up to 4 parameters
- plug & play
- pre-configured & pre-calibrated
- multi-parameter
- online & in-situ
- local display for on-site operation

NO3
BOD
COD
TOC
DOC
TSS
UV-254
Turbidity

The spectro::lyser™
*Flexible & Precise*
- high performance system
- up to 8 parameters
- online & in-situ
- advanced calibration options
- versatile interfaces to DCS & SCADA systems
- integration of additional sensors (pH, Conductivity, O2, NH4, etc.)
- large data memory

NO3
N02
BOD
COD
BTX
TOC
DOC
TSS
UV-Spectra
Turbidity
Contaminant
Alarm

Call us today for a quote! 800 409 8378

Aquatic Life® Ltd.
www.aquaticlife.ca  aquatic@aquaticlife.ca

BC: 604 628 5233  MB: 204 753 5270  ON: 519 489 2697  QC: 514 808 6289
ARE YOU READY FOR THE CLEAN WATER ACT?
WHAT YOU SHOULD KNOW TO BE PREPARED FOR ONTARIO’S NEW SOURCE WATER PROTECTION LEGISLATION

Ontario’s Clean Water Act, 2005 (the ‘Act’) is expected to come into force this spring, once regulations under the Act are finalized. The legislation introduces a watershed-based drinking water source protection regime that will be phased in over the next few years. The Act implements many of Justice O’Connor’s recommendations from the Report on the Walkerton Inquiry.

Under the Act, conservation authorities and municipalities will assess threats to drinking water through assessment reports, and develop source protection plans that will be approved by the Minister of Environment. These plans will include measures to address drinking water threats. Planning decisions, official plans and zoning by-laws will have to conform with the plans. Any decision made by a municipality that relates to the source protection area must, (1) conform with significant threat policies and designated Great Lakes policies set out in the Plan. This will affect new approvals and existing approvals, which may have to be amended to bring them into conformity. The Minister of the Environment also has powers to request that other approving authorities, such as the Department of Fisheries and Oceans amend an instrument to comply with the plan.

Managers of wastewater treatment plants should be mindful that the MOE may seek to revise approvals to comply with the plans. For example, if a treatment plant outfall discharges into a source water protection zone, the MOE may apply an enhanced finished water treatment standard.

New Emphasis on the Great Lakes
While the Act had focused on groundwater from the earliest drafts, final amendments to the Act have elevated surface water protection by including a new emphasis on the Great Lakes.

The Minister can require that Source Protection Plans set out policies to assist in achieving Great Lakes drinking water quantity and quality targets. This could have an impact on surface water discharges into the Great Lakes.

Additionally, the assessment reports and plans for areas where water flows into the Great Lakes will require consideration of the Canada-US Great Lakes Water Quality Agreement of 1978, the Great Lakes Charter signed by the premiers and governors of the provinces and states adjacent to the Great Lakes, and The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (2002). These agreements seek to co-operatively address environmental concerns in the Great Lakes ecosystem.

Plans implementing the Great Lakes agreements must designate the public body responsible for implementing the policy. Public bodies can include municipalities.

New Focus on Storm Water
Urban storm water runoff is a significant source of several pollutants such as organic matter, nitrogen, phosphorus, chloride, heavy metals, suspended solids/silt, oil, grease and pathogens.

Currently, no approvals from the MOE are required for municipal storm water systems unless the storm water is collected in a sewage works which contributes to a direct discharge into a lake or river. Instead, storm water systems are generally governed by design standards, such as the MOE Stormwater Management Planning and Design Manual, 2003, and best management practices.

The Implementation Committee, struck to advise the Ministry on drafting the Clean Water Act, recommended that design criteria for pathogens (among other contaminants) be introduced for storm water management facilities located in areas where there is potential to impact sources of drinking water and recommended that the standards and requirements for the approval of storm water management systems should be continuously improved.

Whether or not design standards are tightened, the threat of contamination of source water from storm water can be the subject of policies in a Source Protection Plan, which can then become binding.
Become Involved in the Source Protection Committee

It should now be apparent that the policies in plans can have far-reaching and long-lasting effects on municipalities.

Assessment reports and plans will be developed by Source Protection Committees. Municipal wastewater managers will want to ensure that the Source Protection Committee’s recommendations are reasonable and attainable. This may not happen if the committee is focused on groundwater and unfamiliar with wastewater issues.

You can become involved in the process of developing the assessment report and plan.

A good first step would be to identify early on issues that the Source Protection Committee might address that may affect your operations. Be proactive: identify risks, and develop best management practices to manage those risks.

The mechanics of how Source Protection Committees will work and their composition is left to the regulations, which are currently being developed.

Municipalities may provide representative members to the Source Protection Committee but should work with all members and local conservation authorities to raise their concerns.

A January 2007 MOE discussion document on the establishment of source protection committees provides some insight.

The number of Source Protection Committee members will range from 10 to 16, depending on the size and complexity of the source protection area.

The Ministry envisions the composition of the committees being:

- at least 1/3 municipal members
- 1 First Nation member
- approximately 1/3 sectoral members (i.e., agricultural, industrial or commercial interests)
- approximately 1/3 other members (e.g., academics, professionals, non-government organizations, and members from the public)

The discussion document envisions that the municipal membership of the committee will represent both the large and small communities in the source protection region, and will adequately represent the different drinking water sources in the region (e.g., groundwater, surface water). It is proposed that the source protection authority (conservation authority) would be required to appoint municipal members selected by the municipalities to the committee.

The discussion documents state that a special municipal working group could also be established to provide broader watershed representation, and to provide technical input.

Even if one is not a member of a Source Protection Committee, there is still the opportunity to provide input through the consultation process. The Source Protection Committee must ensure that consultations take place throughout the development of the terms of reference, assessment report and Source Protection Plan.

By Juli Abouchar and Raj Bharati of Willms & Shier Environmental Lawyers LLP.

Juli is a Partner and Environmental Law Specialist Certified by the Law Society of Upper Canada. Raj is an Associate with a degree in environmental engineering.
The Application of RADAR RAINFALL DATA TO COLLECTION SYSTEM ANALYSIS

The design of major collection system elements such as trunk sewers and large pumping facilities must realistically account for community based inputs as well as possible wet weather flows. The wet weather component often originates in the older portions of existing communities that may be served by the new infrastructure. The designer’s challenge is to predict peak flows for situations far in the future as well as to embrace a wide variety of local collection systems located across a large regional sewershed.

There are many sources of uncertainty associated with such designs. Planning and development predictions and future water use patterns are two that are often important for the dry weather component of the predictions. At the same time, it has become increasingly popular to apply hydrologic-hydraulic models coupled with design rainfalls, to predict peak wet weather flows within the collection system. Model application is generally based on the uniform application of the design rainfall over the entire sewershed. This practice can introduce a positive bias (over prediction) in the resulting peak flow estimates and sewerage infrastructure sizes particularly if the sewersheds are large (>1000 ha).

The Region of York has been addressing this issue recently with the ongoing assessment of the York Durham Sewage System or YDSS. The YDSS collects wastewater from the southern portion of the York Region and conveys flows to the Duffin Creek WWTP in Durham. The YDSS system currently has a service area of 242 km² and a planned future service area of 448 km². To address this issue, a detailed analysis of spatial rainfall was completed to identify reduction factors that could be applied in the assessment and design of the YDSS under design storm events.
The spatial distribution of rainfall intensities analysis utilized data collected by the Region and Environment Canada. Environment Canada collects radar rainfall data through 30 Doppler radar sites located throughout Canada. Doppler radars measure the intensity and location of precipitation as well as the direction of storm travel. The Doppler radar sites typically have a nominal range of 240 km in conventional mode and 120 km in Doppler mode. For this study, data obtained from the King City Doppler radar was utilized. The King City radar is used for research and has a range of 240 km in Doppler mode. In total, nine rainfall events with differing rainfall intensities, volumes and durations were selected for detailed spatial analyses.

Radar reflectivity data was processed to obtain a single precipitation estimate for each 1 km x 1 km grid area or pixel every five minutes. Event rainfall volumes were generated for a total of 2,500 pixels. Radar observations were calibrated or ‘ground truthed’ with rainfall gauge data located at four locations throughout the region. In a few cases, anomalous data was identified. Since radar reflectivity is used to estimate rainfall, some interference is possible, particularly in the presence of tall structures or surface features. For this reason, where unreasonably high estimates of rainfall volume were identified, the corresponding pixels were deemed to be anomalous.

Analyses of spatial rainfall data identified two types of rainfall phenomena: frontal events and convective cells. Frontal events were defined as rainfall distributions where no centre can be identified. In frontal events, there is a distinct line between areas where rainfall occurred and areas where no rainfall occurred. Convective cells were defined as rainfall distributions where the maximum rainfall is recorded at the centre of the cell with progressively lower rainfall recorded as the distance from the centre increases. Convective cells imbedded in frontal events were frequently identified.

Historically, somewhat different data analysis models, used to estimate areal reduction factors, have been applied to convective cells and frontal events. Frontal event reduction factors have been calculated by dividing the maximum pixel rainfall volume by the average pixel rainfall volume. For convective cells, reduction factors have been calculated as the maximum pixel rainfall at the centre of the cell divided by the average rainfall for a square group of surrounding pixels. In both cases, a relationship between rainfall reduction factor and area is developed.

Figure 1. Representative Reduction Factors versus Area
by plotting a series of reduction values calculated for different frontal events or different groups of pixels considered for convective cells.

This type of methodology was first applied to the collected data set. However, the results of analysis from the limited number of available storms proved unsatisfactory as the convective cells were small relative to the size of YDSS service area and the frontal events were much larger than the size of the YDSS service area.

An alternative approach was developed using conventional statistical concepts. If the reduction factor is a random variable and is independent of specific location, a series of reduction factors can be calculated for a series of pixel groups of varying size. For each series of reduction factors, a mean, maximum, minimum, standard deviation and confidence intervals can be calculated. These calculations can be carried out for any number of randomly sampled pixel groups corresponding to areas of 1 km² (100 ha) to 2,401 km² (240,100 ha), where 2,401 km² represents the full extent of the grid considered in the analysis. Figure 1 presents a representative series of distributions for a single event. The figure shows the calculated reduction factors for a series of areas and the statistics generated from the calculated reduction factors. Statistics generated included the mean, 95% confidence intervals, the minimum value and the maximum value. The 95% confidence interval closely brackets the mean value. The analysis was extended to cover a series of events, increasing the level of confidence in the reduction factors. This alternative analysis methodology was applied to the data collected for each of the nine rainfall events considered to derive maximum and mean reduction factors for areas ranging from 1 km² to 2,401 km².

Analysis results were combined for all events and were found to be quite similar. In general, the marginal change in reduction factor is highest for small areas. As area increases, the marginal change in reduction factors decreases and the curves are flatter.

The results of the statistical analysis were carefully considered in the development of the areal rainfall reduction factors. Based on the analyses results, a series of reduction factors were developed that could be analyze the capacity of the YDSS. These factors vary based on the area of interest and range from 1 or no reduction for sewershed level analysis to 0.67 for system wide analysis.

Through the extensive data analysis, it was shown that models using uniform rainfall over a large service area would tend to over prediction of peak flows. To address this shortcoming, radar rainfall as well as conventional rain gauge data was employed to develop watershed specific areal reduction factors. The reduction factors will be used in future with existing modelling tools and design rainfalls to plan and design the future YDSS system.

Christine Hill of XCG Consultants Ltd, George Zukovs of XCG, Tracey McLean of York Region and Daniel Jobin of Kjej Sipi Ltd.
Versatile WASTEWATER treatment options to suit your needs

Metcon Wastewater Treatment

EcoProcess SBR • Type 2
The EcoProcess Type 2 SBR makes use of un-baffled reactors and alternately feeds one at a time with 100% of the flow. This treats the wastewater in defined batches, allowing for an aerated no-flow period before the treatment cycle is completed. EcoProcess SBR’s are ideal for municipal development when partial Bio-P removal is desired or treatment of highly concentrated wastewater to meet stringent effluent quality requirements.

- One-tank process, no clarifier, no sludge recirculation
- Multi-reaction process in the same reactor
- Treats wastewater to <5 mg/L for both BOD and TSS.
- Provides complete nitrification & significant denitrification.
- Bio-P reduction to <0.3 mg/L TP with chemical assistance.

AIRE-O₂ Bio-film™ • Fixed Film System
The Bio-film system is a submerged, attached-growth media process using high effective fabric technology and Aire-O₂ Triton™ aerators.

- The concentrated biomass creates conditions for a high degree of nitrification year-round, even during cold weather.
- Process is self-regulating and requires no maintenance.
- Dense biomass communities on the fixed film increase Solids Retention Time (SRT) & provides simultaneous nitrification/denitrification processes.
- Allows for higher influent loadings to the process.
- Installation and maintenance are easy, eliminating the need for new construction and plant downtime.

Quality Focused. Customer Connected.

15 Connie Crescent, Unit 3 | Concord, Ontario L4K 1L3 | T • 905.738.2355 | www.metconeng.com
SWELTERING HEAT, a record number of smog days and sudden severe storms marked the summer of 2005. Just a week into the wet weather season, the City of Hamilton was hit by a powerful thunderstorm that caused extensive damage and flooded dozens of basements. Less than a month later, during the afternoon of August 19, a line of severe thunderstorms tore across southern Ontario, hitting Hamilton particularly hard and causing widespread water and wind damage from Kitchener to Oshawa. This time, hundreds of basements were flooded with surface water and diluted sewage as segments of the collection system surcharged, creek channels were severely eroded and roads left under water.

For some unfortunate residents, this was the third time in just over a year that their basements were flooded and property damaged by sewage and storm water. In the previous spring, a 1:50 to 1:100 year event drenched portions of the city, causing similar damage. Unfortunately, 2006 did not offer any relief, as yet another major storm pummelled Hamilton on June 10. Residents were understandably distressed by sewer backups and damaged residences. They were also worried about the possible short- and long-term health concerns from mould, mildew, faeces and bacteria; not to mention the possible insurance implications from repeated claims, such as loss of coverage.

According to the Insurance Bureau of Canada, the effects of the August 19 storm represents the highest insured loss in Ontario history, with more than half a billion dollars in claims across southern Ontario. This far exceeds combined payouts for the 1998 ice storm and the 2004 Peterborough flood. In fact, 2005 was a wild weather year on a global scale, the second warmest in 145 years according to the WMO, and the costliest on record, exceeding all previous economic and insured losses (over $300B USD). The potential impacts of climate change could mean less predictable weather and more extreme storms in the future. Cities are especially vulnerable to weather related disasters; organizations like the Institute for Catastrophic Loss Reduction recommend a proactive approach by municipalities and investment to reduce risks from weather related disasters.
Following the damage of the August 19 event, Hamilton City Council directed staff to establish an Independent Community Panel to review the effects of these storms. This panel was part of the larger Storm Event Response Group, or SERG: a multi-disciplinary, multi-department group comprised of City staff from Water and Wastewater, Capital Planning and Implementation, Operations and Maintenance, Risk Management, Communications, Corporate Services, Planning and Economic Development, as well as outside consultants. The independent panel was asked to review the causes of flooding, the City’s response to these events, and provide expert opinion on plans and actions required to minimize the effect of future severe storms. The five-member panel was comprised of experts representing a wide range of disciplines:

- Wastewater Engineering
- Watershed Planning and Storm water Management
- Insurance and Catastrophic Loss Reduction
- Climate Change
- Landscape Management

The mandate of the panel was fourfold:

1) Address the causes and effects of severe wet weather on Hamilton's storm water and wastewater systems.
2) Recommend a public communications strategy to help Hamiltonians interpret and understand issues concerning risk management, compensation, potential health concerns and future vulnerability.
3) Conduct a high level assessment of the City of Hamilton’s Storm water and Water/Wastewater master plans.
4) Review and consult with the insurance industry.

During the spring and summer of 2006, the independent community panel consolidated information and experiences garnered from tours of flood affected areas, meetings with residents, consultants, agencies, insurance representatives, staff and researched best practices from other Canadian municipalities. At the same time, the rest of SERG was busy analyzing data, investigating flooding hot spots, assessing the collection system, and reviewing operational protocols. The SERG group also commissioned a storm characterization study to help understand synoptic storm climatology, using the existing rain gauge network coupled with cutting edge RADAR rainfall analysis and long-term statistics.

The independent community panel indicated that the primary source of wet weather problems in our system could be credited to the sheer magnitude of the storms, however, different areas of the City are unique in their vulnerability to these events, with the biggest factor being whether stormwater is conveyed in a separated or combined sewer system. There are multiple factors implicated for storm related damages including:

- Inefficiencies in sections of the overland flow system including clogged catch-basins, despite pre-storm maintenance efforts.
- Sub-division, home and landscape designs such as down-
ward sloping driveways and basement alterations that may leave homeowners vulnerable to flooding.

- Backup of combined sewers into basements.
- Alteration of swales and lot grading which impacts their effectiveness to convey storm flows.

The independent community panel also questioned the appropriateness of design standards based on historic rainfall and an unchanging climate. However, adopting more robust design guidelines to accommodate more severe storms would likely result in large capital investment costs. This requires a policy discussion between council, residents and staff as to what is an acceptable level of risk, and the resulting costs and benefits.

Although the independent community panel was impressed with City staff initiatives to understand and reduce problems associated with extreme storms such as: ongoing CCTV sewer investigations, rainfall monitoring, master plans and sewer modeling, the panel was able to offer a set of 26 important recommendations to address problems. These recommendations were broken down into the areas of engineering and design, urban design and planning, communications, and policy implementation. Some of the major recommendations of the panel included:

- An aggressive and proactive approach to stormwater infrastructure planning, design and flood mitigation, with the understanding that climate change may mean more frequent and severe storms.
- Maintenance or expansion of the City’s rain gauge network, with potential to include advanced weather forecasting tools such as real time and predictive radar.
- Initiation of pilot programs for flooded areas which could include installation of protective plumbing on individual buildings such as backwater valves and sump pumps, downspout disconnection, rain barrels and cisterns coupled with sewer flow monitoring to assess effectiveness of such an effort.
- Develop a comprehensive communications plan that will inform residents as to why stormwater damage can occur, the risks and avenues for compensation. The respective responsibilities of both the City and the individual resident must be communicated. Residents must also be aware of the importance of reporting flooding so that staff can improve the flooding database and coordinate works accordingly.
- Communication between the City and the insurance industry must also be strengthened. Insurers should be made aware of the efforts that the City is taking to mitigate risk.

The City of Hamilton understands the distressing nature of flood related damage. Currently, the SERG group is busy addressing future flood mitigation strategies and have been acting on these recommendations, taking a proactive approach in preparation for that inevitable next big storm.

Chris Gainham and Gerry Davis of the City of Hamilton and Carl Bodimeade of Hatch Mott MacDonald

---

**Call for Articles**

**INFLUENTS** readers are invited to submit finished articles, article proposals and article suggestions for inclusion in future issues of **INFLUENTS**, the official publication of the Water Environment Association of Ontario (WEAO). Articles should be approximately 500-2,000 words in length and should not be ‘advertorial’ in nature.

The topics must be of general interest to the WEAO membership and may cover such things as operation and maintenance tips, industry projects, proper application/selection of equipment or processes, industry news, innovative technology and so on.

The selection of the articles for inclusion in **INFLUENTS** is at the sole discretion of the WEAO Communications Committee. The Committee also reserves the right to edit the article as necessary, for clarity, brevity or unseemly commercialism.

Notwithstanding the foregoing, getting your article published in **Influents** is a very good way to gain credibility in the Ontario marketplace and stand-out among your peers.

To submit a finished article, please include the following info:

- Your name and title (ex. P.Eng., C.E.T., etc.)
- Your organization
- The article topic and synopsis

To submit an article proposal please include:

- A title and brief description (50-100 words) of the proposed topic

You may also simply write in with suggestions of topics for future articles.

All articles, proposals, and suggestions should be sent to Emil Cocirla, WEAO Communications Committee Chair at: emil@can-am.net
PURIFIED SOLUTIONS TO SUIT YOUR SPECIFIC NEEDS.

REPRESENTED PRODUCTS

DUPERON CORPORATION
- coarse and fine mechanically cleaned bar screens
- trash racks
- screenings compactors

MARSH-MCBERNEY, INC.
- area velocity and insertion mag flowmeters
- for water and wastewater applications
- rental units available

VIKING CHAINS
- chain and flight collector components

PHOENIX PROCESS EQUIPMENT CO.
- belt filter presses
- gravity belt thickeners

REDOX WATER TECHNOLOGY B.V.
- advanced industrial wastewater treatment systems
- dissolved air flotation, plate clarifiers

SONICO
- ultrasonic cell lysis/digester optimization

BAY PRODUCTS, INC.
- odor control systems
- adsorbers, scrubbers, bioWageal filters
- odor control media

ZMI PORTEC
- lime slakers
- chemical feed systems

GRISWOLD WATER PRODUCTS
- electronic precipitation systems
- advanced non-chemical scale reduction

HYDRO INTERNATIONAL
- wastewater treatment systems and components
- CSD systems
- vortex grit removal systems

With 25 years of proven experience in advanced water quality solutions, ACG Technology Ltd. has established itself as a leading provider of water, wastewater, and stormwater treatment systems for industries and municipalities. By offering high quality, innovative products and systems, we continue to meet the operational and compliance needs of our valued customers. The way we see it, the solution is pure and simple.

ACG TECHNOLOGY

GENERAL COMPANY SERVICES

- wastewater treatment products
- stormwater treatment products
- water treatment products
- flowmeter sales, service and rentals
- engineering services
- on-site installation

INDUSTRIAL WATER TREATMENT

- membrane filtration systems
- ion exchange

INDUSTRIAL WASTEWATER TREATMENT

- batch and continuous treatment systems
- MBR -- membrane bio-reactors
- membrane filtration systems
- coalescing oil/water separators
- alkaline cleaner recycling systems
- clarifiers
- skimmers
- evaporators
- coolant treatment systems

For further information regarding ACG Technology’s services, check out our new website @ www.acgtechnology.com
The tangerine shirts of the Collections System Committee (CSC) were clearly visible when the CSC Fall Seminar was held at the Milton Ramada Inn on November 15, 2006. This year, the seminar was focused on the assessment and rehabilitation of linear water and wastewater infrastructure and many presenters focused on state of the art assessment techniques for linear infrastructure. The morning session was geared towards assessment techniques with a number of papers presenting new technologies for sewer assessment. The afternoon session was geared towards the application of trenchless technologies for the construction and rehabilitation of infrastructure. Presentations included:

- The City of Hamilton’s Three-Year CIPP Sewer Rehabilitation Program;
- Side Scanning Evaluation Technology and its use in the City of Niagara Falls;
- Trunk Sanitary Sewers: Inspection and Condition Assessment;
- Watermain Break Reduction Study in the City of Toronto;
- Condition Assessment and Repair Technologies;
- Time Based Analysis of Buried Infrastructure with Quantitative Results;
- Infrastructure Replacement: When is HDD an Option;
- HDD Using PVC Segmental Watermain;
- H₂S Attack on Large Region of Niagara Pipe and Solution; and
- Ottawa Forcemain Goes in Trenchless – Lessons Learned.

In addition to the presentations, Tom Woods of Cretex Specialty Products was on hand with an interesting display of manhole lining equipment. Again this year, a panel discussion was held at the end of the day where a broad discussion was held on the application of new system assessment technologies and trenchless construction techniques.

Special thanks to all of our guest speakers including Kevin Bainbridge, Mark Knight, Mark Andrews, Robert Klimas, Cliff Jones, Scott Thayer, Eugene Chaika, Dave Crowder, Ian Doherty, and Brett Bye, as well as to Julie Vincent of WEAO.

Christine Hill, M.Eng.,
Associate, XCG Consultants Ltd. and
Barbara A. Robinson, M.A.Sc., P.Eng.
Senior Project Manager,
Stantec Consulting Ltd.
"WE TOOK THE CHALLENGE..."

Joe Devito, Director of Field Operations at Beaufort Jasper Water and Sewer Authority. The BJWSA system consists of over 300 lift stations.

"...AND NOW I SPEND MY TIME UNCLOGGING MY DESK INSTEAD OF OUR PUMPS."

Removing debris from clogged pumps was routine at the authority. The ABS Contrablock system was installed. Problem solved.

Give us your most challenging pump station and put ABS and the Contrablock advantage to work for you. ABS will work with you to develop a system that meets the specific requirements of your application and jointly evaluate the solution for 30 days. If you are not completely satisfied with the results, return it with no obligation.

Are You Up For The Challenge? Call 1-800-525-7790

Corporate office:
ABS | 140 Pondview Drive | Meriden, CT 06450 | Fax: 203-514-4364

abs
We know how water works.
The City of Ottawa recently completed the construction of the Munster Hamlet Wastewater Pumping Station (MHPS) and Forcemain. Stantec Consulting Ltd. (Stantec) was retained by the City to provide preliminary design, detailed design and construction services for the implementation of the MHPS and forcemain system.

Due to the fast tracked nature of the project, the completed project involved five phases of construction, including three forcemain installation contracts, one pumping station contract and a final lagoon decommissioning contract. The contracts were released sequentially in response to the need to advance the contract for certain environmental constraints while allowing time for detailed design of the multi-disciplined MHPS to proceed simultaneously.

This paper focuses on Phase 1 and Phase 2 of the overall project which involved installation of the forcemain using horizontal directional drilling (HDD).

The City of Ottawa has recently constructed a new sanitary pump station and forcemain to replace sewage lagoons at one of the outlying communities, Munster Hamlet. Wastewater servicing for the Munster Hamlet community in southwest Ottawa now involves pumping sewage from the existing lagoon/pumping station site in the Hamlet nearly 12km (7 miles) to the Village of Richmond where it is discharged to Ottawa’s wastewater collection system. The alignment selected for the new forcemain involved construction of the pipe along the edge of shoulder of predominately rural roadways and along one of the main streets through the Village of Richmond, as well as sensitive locations such as: crossing of the Jock River, the Richmond Fen and the Arbuckle Municipal Drain.

To minimize construction impacts within the Village of Richmond and the sensitive portions of the alignment between Munster and Richmond, horizontal directional drilling (HDD) was selected as the preferred installation method for approximately half of the forcemain length. HDD also provided the added benefits of minimizing disruption to roadways and utilities. Open cut construction was utilized for the remaining 6km (4 miles) due to shallow bedrock.

This paper will present design considerations applied to the project in the selection of the appropriate installation method, pipe material and chamber locations. ‘Lessons learned’ during the construction and commissioning of the pipeline will be identified for consideration and use on other projects.
within Richmond due to construction. Phases 1 and 2 of the project involved construction of the forcemain in Richmond and for a downstream portion of the alignment where HDD was thought to be feasible and cost-effective considering the soil and bedrock conditions.

Within Richmond, several forcemain alignments were evaluated based on a number of criteria including construction disturbances, groundwater, fisheries, soil and bedrock conditions, existing infrastructure, heritage features and operations and maintenance. This evaluation was presented to the residents of Richmond at a formal open house where comments on the various routes and other overall preliminary design elements where obtained. Ultimately, the most direct alignment within the public right of way (ROW) was selected, following Perth Street and Cockburn Street directly to the Richmond PS.

Outside Richmond limits, the forcemain alignment was selected to minimize impact on the existing road structure and avoid extensive traffic control during construction given the rural nature of the ROW, which entails a two-lane asphalt road with a rural cross section (i.e. shoulders and ditches). Review of existing utilities clearly illustrated a preference to align the new forcemain along the south edge of shoulder along Frankstown Road.

**Phase 1: Jock River Crossing**

Phase 1 of the construction contract involved installation of the 200mm (8 inch) diameter forcemain from the discharge at the Richmond PS south under the Jock River along Cockburn Street to Perth Street. This portion of the forcemain was tendered first to allow the Jock River crossing to be completed prior to the March 15 to June 30 moratorium on in-water works. The moratorium is intended to protect fish habitat during spring spawning periods.

The forcemain corridor on Cockburn Street was finalized following a thorough review of the recently completed CCTV investigation to confirm the location of existing utilities and assessment of the relative construction cost differences between open cut versus directional drilling construction method. The alignment selected is along the centerline of the roadway angling over the existing 675mm gravity sanitary sewer at the river crossing for a clear alignment to the Richmond PS.

During the design phase, a document review revealed that two existing sanitary sewers were installed on Cockburn Street. A deep trunk sewer (675mm diameter) that passes underneath the river to the Richmond PS is located on the west side of the street. The trunk sewer depth eliminated it from utility conflict with the new forcemain. A shallower sewer (250 to 450mm diameter) serving the local residents was located on the east shoulder of the street at approximately the same elevation of the new forcemain. The individual sanitary lateral elevation data was unavailable during the design phase.

Prior to the start of the HDD pilot hole, a number of residential house service laterals along the west side of Cockburn were investigated (See Figure 2) to confirm elevation, and were determined to be in conflict with the proposed vertical alignment of the forcemain (house service laterals depths ranged from 1.8m to over 4m - 6 to 13 feet). These conflicts resulted in the need to lower the new forcemain below the existing service laterals while avoiding pronounced high or low points in the forcemain vertical alignment, which could have resulted in air and/or drain problems.

The river crossing was uneventful with the HDD being completed from the north side of the river toward the Richmond PS. The open area (public park) adjacent the Richmond PS was utilized for the 200m 200mm diameter (8 inch) DR 11.0 HDPE pipe string during the pull back toward the air release chamber on Cockburn Street. Three additional drills were undertaken along Cockburn Street completing installation of Phase 1.

The installation of the isolation/bypass chamber on Cockburn coincided to the cross over of drill #1 and drill #2, whereby the cross over point was excavated and the chamber installed. Due to the previously mentioned public concerns with respect to groundwater impact from a forcemain leak, the design provided for the continuation of HDPE through the chamber walls where it transitioned to ductile iron fitting and valves. This transition was moved inside the chamber to avoid the need for a gasketed joint outside the chamber, which would be more likely to leak than a fully fused HDPE joint. This detail appeared straight forward on the design table, but required considerable thought during construction to get the fairly rigid HDPE pipe aligned through pre-cast holes in the chamber wall from both sides. In the end, fusion couplings were used to make fully fused joints on either side of the chamber allowing shorter ‘spool pieces’ to be used for the wall penetrations as illustrated in Figure 3.

The Poisson Effect was found to be an issue during the construction. The Poisson Effect describes a relationship in which a material that is placed under tensile stress elongates in the direction of that applied stress, and subsequently
contracts perpendicular to the direction of the applied stress. This effect occurs in all materials, but is particularly apparent in ductile materials, such as HDPE. With unrestrained bell and spigot type joined lengths, the Poisson Effect is limited to the individual pipe lengths, but with fully restrained pipes like HDPE, the effect is cumulative over the entire restrained length of pipe, which may cause in-line unrestrained joints or connections to be pulled apart.

Therefore, when the forcemain is pressurized (i.e., pressure testing and operation) the subsequent Poisson Effect pullout force must be accommodated for during design and construction when transitioning to other materials (e.g., ductile iron (DI) piping in chambers).

There were two basic options available to counteract the Poisson Effect pullout force.

1. Provide mechanical restrained joint within the chamber between the HDPE and DI connection, therefore fully restraining the entire pipe (Figure 4);
2. Weld a polyethylene anchor to the HDPE pipe outside the chamber and pour a concrete anchor block around the polyethylene anchor and pipe. The weight of the block and reaction force against the soil will then counteract the pullout force. (Figure 5)

In this project, the ability to remove and maintain all isolation valves was considered to be important, such that an electrofusion flex restraint was incorporated into the construction (see Figure 6) to allow use of mechanical joint restraints at the HDPE/DI transition. This type of joint is a fully restrained jointing method for connection of HDPE (or other materials) pipe to DI pipe. The decision of restraint
method (either mechanically or passive with a anchor block) should be considered carefully during design to ensure that adequate space is available in the chamber to include all the pipe fittings (tees, spool pieces, isolation valves, drain out valves and potentially a dismantling joint).

Phase 2: Village of Richmond to the Richmond Fen

This segment of the forcemain encompassed approximately 5km of HDD works including crossing of Hobb's Drain within the environmentally sensitive Richmond Fen and the Arbuckle Drain. The installation was completed with 16 pulls ranging in length from 200-350m depending on available drill locations, proposed chambers and soil conditions. While the installation of the 200mm forcemain proceeded very well during this phase of the project, issues arose with the respect to the use of the weak link device to ensure that undue tensile forces were not being applied to the pipe string during pull back operations especially important given the length of the pulls. Monitoring of the pull backs noted that larger than anticipated forces were being applied during pull backs which was attributed to soil conditions and a seasonal variation in the groundwater table whereby the soil was significantly drier than that experienced during Phase 1 (drilling done in March/April).

To protect the pipe from potential overstressing and stretching a weak link device was incorporated into the pull back string between the drill string and the back-reamer. The setting of the weak link was completed in consultation with the HDPE pipe supplier whereby the device would ‘break’ preventing damage to the pipe (see Figure 7). Fortunately, the weak link device was used as it ‘broke’ on two occurrences on subsequent pull back operations in especially long drill sections.

During this phase of construction, two (2) HDD water-body crossings were required: Hobb’s Drain and the Arbuckle Drain. The appropriate agencies (i.e., Ministry of the Environment, Rideau Valley Conservation Authority, Department of Fisheries & Oceans) were contacted during the design phase to determine the appropriate level of protection required and the optimal timing for these crossing to limit impacts to the environment should there have been a problem. These agencies were notified during construction and were invited to inspect the installation and protection measures.

During the commissioning of the forcemain, the pipe was pressure tested and potable water was pumped in order to determine that the forcemain operated in accordance with the hydraulic design. The design of the forcemain and pump station also incorporated a swab launcher for future cleaning. The swab launcher was tested and during the test the swab became caught in the forcemain. The swab was then located and the forcemain was excavated and inspected. Granular material was found within the forcemain causing the blockage. Following this discovery, the contractor cleaned the forcemain in sections and the swab test was completed without further incident. It appeared that, despite diligent construction practices, this granular material might have been introduced via overnight flooding of an open pit allowing the granular material to enter the open end of the pipe.
Conclusions

Overall, by utilizing HDD methods the reinstatement costs were much lower than open cut installation and impacts to traffic were minimized. The following is a summary of the lessons learned that will facilitate improved future installations:

1. Confirm lateral/cross over elevations either by hydro-vac, test pits or trenchless methods (camera sonde) prior to construction.
2. Carefully select and assess proposed chamber connections to take into consideration constructability and chamber pipe assembly issues.
3. Incorporate appropriate longitudinal restraint into the design to counteract Poisson Effect force by selecting either mechanical or passive restraint approaches and be aware of the impacts of these approaches on chamber piping/sizing (e.g., mechanical restraints, anchor blocks).
4. Apply best practices to drilling and pull back operations to avoid potential damage to the host pipe (e.g., weak link device).
5. By ensuring that the installed forcemain was clear of material prior to putting the forcemain into service, avoided a potential future blockage, which would have been a far more costly, complicated repair.

References


Brett Byce, P. Eng, Stantec Consulting Ltd., Ottawa, Canada, Ryan Matthews, P. Eng., CH2MHILL, formerly of the City of Ottawa, Canada, and James Ricker, P.Eng., Stantec Consulting Ltd., Ottawa, Canada
In June 2006, Water For People – Canada was designated by the Canadian International Development Agency (CIDA) as a recognized non-governmental organization, eligible to apply for funding. What this will mean is that Water For People – Canada will be able to apply to CIDA for grants under its Voluntary Sector Fund that matches donor dollars at a rate of three to one. As part of its preparation to apply for CIDA grants, the Board of Water For People – Canada has designated Bolivia as its “country of focus” for the next two to three years.

Fast Facts about Life in Bolivia

- The national economy is based on exports of minerals, oil, natural gas, wood, and Brazil nuts.
- It is one of the poorest countries in Latin America, and ranks 113th out of 177 on the UN Development Program’s 2005 Human Development Index.
- Average family income is US$150 per year.
- Bolivia has a population of more than 8.2 million people, 62.5% of which lives in urban areas, and 37.5% of whom are rural dwellers.
- Average male life expectancy is 61 years; average female life expectancy is 65.
- Urban child mortality (under age 5) is 59 per 1,000; in rural areas, it’s 96 per 1,000.
- 24% of Bolivian children under the age of three suffer from chronic malnutrition.
- 2.3 million Bolivians have no access to safe water; almost five million have no access to sewage systems and solid waste disposal.

Water For People In Bolivia

Water For People – Canada, together with Water For People in Denver, Colorado, has been working in Bolivia since 1997. By the close of 2005, a total of 148 projects, benefiting 37,000 individuals, had been supported in the country, with a total value of almost three-quarters of a million US dollars. The majority of these projects have been water projects, followed by sanitation initiatives and technical/hygiene education provision.

In 2007, Water For People will be taking a more strategic approach to its work in Bolivia. Guided by a newly minted five-year Country Strategy, Water For People will “focus its actions ... in a holistic manner” to meet the increasing and urgent needs for water and sanitation.

As part of this focus, we, together with our in-country partner agencies (including Plan International – formerly Foster Parents Plan – and CARE) will be placing particular
emphasis on generating demand for sanitation (a challenge in a country where there is a lack of customary use of bathroom facilities), and the offering of technical options that take into account the financial resources available to address operation and maintenance issues.

Through these efforts, Water For People will be assisting the communities in which it works to build capacity in areas such as leadership, watershed management, surveying, and operation and maintenance of water and sanitation systems.

A Global Strategy

Globally – as well as in Bolivia – Water For People will be working diligently to meet the following goals by 2011:

- Provision of sustainable basic sanitation services to at least 1,000 new people per day (up from 200/day in 2005);
- Enhancement and replication of our international programs model to increase impact within existing countries (Bolivia, Guatemala, Honduras, India, Malawi) and double our program countries from five to ten;
- Development of financial resources to support this rapid growth;
- Exceeding a goal of 85% of revenue applied to international programs.

All of Water For People – in Canada, in the United States, and in the countries in which we work – are committed to reaching each of these goals.

How You Can Help

- Participate in Water For People – Canada activities (silent auctions, raffles and draws) at WEAO events;
- Tell your family, friends, and colleagues about Water For People – Canada and encourage them to support our efforts;
- Join Water For People – Canada Committee. For information, please contact me by phone (416.499.4042) or e-mail (cdenomy@waterforpeople.org).

With information from Water For People’s Bolivia Country Strategy, 2007-2011

Cheryl Denomy, General Manager, Water For People – Canada
The PWO Southwest Region Fall Seminar was held at Branch 28 of the Royal Canadian Legion in Chatham Ontario on November 8, 2006. The seminar had a total attendance of 29 Delegates and nine exhibitors.

President Bill Clark welcomed everyone to the Seminar and introduced Jack Sonneveld, Senior Level Advisor, who brought greetings from Chatham-Kent PUC.

WEAO Vice-President Peter Takaoka of R.V. Anderson explained that WEAO is looking to the future and foresees dramatic changes coming in the industry in the next 10-15 years. One major thing will be that 35-50% of those in the industry will be eligible to retire.

The association is becoming a more recognized source for protecting the environment, by working with other associations, attracting students to a career in the industry and meeting with all levels of government.

Operator’s Challenge Chairperson Gary Burrows, from the City of London, gave a presentation on the 2007 OPS Challenge and some of the benefits of participating in it. Volunteers and participants are needed to make this annual event a success.

John Wraight, from Hetek Solutions, explained some of the highlights of the new confined space entry regulations that took effect on October 1, 2006. If you are classified as the owner of a confined space, you are responsible for having the trained personnel to implement these new regulations.

Jack MacRae, from the City of Windsor, was able to enlighten everyone on the effects of Microthrix Parvicella bacteria in Activated Sludge through a Powerpoint presentation, and disclosed Windsor’s ongoing solutions to the problem.

Robin Dudley, Supervisor of Compliance & Monitoring, Chatham-Kent PUC, explained the focus and direction that the new MOE Certification Working Group will be taking. The committee will be providing expertise to the MOE in regards to all aspects of Certification.

Suni Ball, of Henkel Corp. (Locktite), was able to show the products available for use at wastewater treatment plants.

This year, we are planning to put the money raised towards the new WEAO Scholarship Program with the recipients coming from Southwestern Ontario colleges. Final details still have to be worked out.
OPERATORS’ CORNER

The Southwest PWO would like to thank the speakers and delegates for attending our 2006 seminar. A special thank you to Julie Vincent, John Thompson, Bob Crane and Jack MacRae for all their help.

Thank you to the following suppliers for setting up displays:
- Protectolite Inc.
- Endress & Hauser
- John Meunier Inc.
- Pro-Aqua & Shadrack Inc.
- Classen Pumps Ltd.

Can-Am Instruments Ltd.
- CIBA Speciality
- Chemicals Canada Inc.
- Hardie Industrial Services Inc.
- Henkel Corp. (Locktite)

PWO Southwestern Committee for 2006/2007:
- President: Bill Clark
- Vice-President: Jack MacRae
- Secretary: Trevor Bourgeios
- Treasurer: Julie Vincent

Bill Clark, Chatham-Kent PUC

PWO CONTACT INFORMATION

Ontario’s wastewater operators are currently represented by the following individuals:

WEAO Board Representative:
- John Thompson, Region of Durham
  john.thompson@region.durham.on.ca

Southwest Region Representative:
- Bill Clark, Chatham-Kent PUC
  billclark@ciaccess.com

Southeast Region Representative:
- Stephen King, Utilities Kingston
  sking@utilitieskingston.com

Two thirds of the earth’s surface is covered by water. The rest is covered by SEW-Eurodrive.

Manufacturers and Machine Builders in Canada and around the world look to SEW-Eurodrive for integrated drive solutions and round-the-clock service and support.

With three Canadian assembly plants and more inventory than all our competitors combined - we are the nation’s leading supplier of Geared Motors, speed reducers and electronic controllers.

For the complete solution, call SEW-Eurodrive.

DRIVING THE WORLD.
www.sew-eurodrive.ca
PROFESSIONAL WASTEWATER OPERATORS (PWO)

PWO addresses the concerns of the men and women whose primary work involves performing the hands-on tasks needed to operate, analyze, and maintain wastewater collection, treatment, and laboratory facilities.

PWO is dedicated to:

• Providing a forum in which wastewater operators may voice their concerns.
• Advancing the technical skills of wastewater operators through curriculum development, workshop presentations, and annual regional conferences.
• Creating, gathering and distributing reference materials required by wastewater operators.
• Supporting and developing activities, such as the Operations Challenge, that improve the recognition and develop the skills of wastewater operators.
• Promoting the careers of wastewater operators.
• Enhancing the self esteem of wastewater operators who are capable and dedicated professionals that make water quality a reality.

PWO is well positioned to represent the interests of Ontario’s wastewater operators:

• Ontario’s wastewater operators are represented by regional PWO Committees, each with their own executive.
• A PWO representative sits on the Board of the Water Environment Association of Ontario as a voting member.
• Four PWO representatives sit on the Ministry of the Environment’s Operator Certification Working Group. The Working Group provides expertise to the Ministry on matters pertaining to the water and wastewater operator certification program. This includes issues relating to: facility classification, certification examinations, licensing and certification requirements, the assessment of training to meet the certification requirements, content of mandatory training courses, outreach related to Ontario Regulations 128/04 and 129/04, and other related matters.

For more information about PWO, contact: John Thompson at john.thompson@region.durham.on.ca or the WEAO office at julie.vincent@weao.org.
PROBLEM SOLVING WORKSHOP

Back by popular demand!


In North America, training authorities have recognized that problem solving skills are lacking among operators. This workshop has been designed to address this shortcoming in an interesting and informative way.

The workshop uses innovative knowledge-transfer skills to create a highly interactive and motivating atmosphere – ideal for learning. While working through case studies that focus upon the Activated Sludge Process, participants will be expected to utilize the problem solving techniques taught during the day.

The workshop is designed for experienced operators and supervisors involved in overseeing plant operations. Although the course will cover some aspects of process knowledge, it is not intended to provide comprehensive instruction in the Activated Sludge Process.

The workshop will provide participants with a framework for solving problems at wastewater treatment facilities, while stressing the importance of a team approach. Participants can expect to be challenged individually and in a group scenario.

For more information, contact John Thompson at john.thompson@region.durham.on.ca

FALL PWO CONFERENCE IN SUDBURY

Tentatively scheduled for October 10 and 11, the Sudbury Conference will provide training opportunities and offer wastewater operators the chance to compare notes with their peers. The Conference will be approved for CEU credits.

For more information about the Sudbury PWO Conference, contact John Thompson at john.thompson@region.durham.on.ca or the WEAO office at julie.vincent@weao.org.

Come to London for the 36th Annual WEAO Technical Symposium and OPCEA Exhibition.
Stay for the workshop.
MOE PREPARES TO LAUNCH NEW WATER AND WASTEWATER OPERATOR CERTIFICATION SYSTEMS

Drinking water and wastewater operators will soon have direct access to key information to help them track their operator certificates.

The system is called the Water and Wastewater Operator Certification Systems (WWOCS) and is currently being implemented by the Ministry of the Environment. Full implementation of this system is expected in April 2007. At that time, operators will have the ability to view their own personal certification information, including their certificates and expiry dates, all ‘Director Approved’ courses which have been successfully completed since January 2007, past exam results, and the status of applications. Operators will also be able to order exam study material online, apply to write exams, and change their address.

Starting in March 2007, the Ontario Environmental Training Consortium (OETC), the Ministry’s third party administrator, will send inserts on this new system with operator certificate renewal notices. The inserts will provide instructions on how you can obtain a user ID and password for accessing the new system. Starting in April 2007, you may also contact the OETC to have a user account set up prior to receiving your certificate renewal notice.

The Ministry and OETC are committed to ensuring that your personal information is protected and only used for certification purposes. WWOCS was developed in full compliance with the Freedom of Information and Personal Privacy Act. If you have any questions about the collection, use or dissemination of your information, please contact the Ministry’s Freedom of Information and Privacy Office at (416) 314-4075. WWOCS has been built with security measures to ensure that only the appropriate individuals have access to the information.

OETC will continue to accept application forms submitted by mail, online access is not a mandatory requirement. For inquiries on WWOCS or the Certification Program, please contact OETC at (905) 796-2851, or via the web at www.oetc.on.ca.

ONTARIO MINISTRY OF THE ENVIRONMENT DESIGN GUIDELINES

The Ontario Ministry of the Environment has undertaken a review of the current guidelines that were last produced over 20 years ago. OPCEA, has produced a draft set of guidelines which will be posted shortly on the Ministry Environmental Bill of Rights (EBR). The OPCEA website will post the link to the MOE EBR when it is made available. We encourage all OPCEA members to review and comment directly to the Ministry on these documents when they are released. It is expected that they will be released in April or May of this year.

2007 WEFMAX MEETINGS

WEFMAX is when WEF directors meet with representatives from WEF Member Associations (MA) to discuss the direction of the organization.

March 1-3
WEFMAX in Salt Lake City, Utah

March 29-31
WEFMAX in Annapolis, Maryland

April 19-21
WEFMAX in Chicago, Illinois

May 3-5
WEFMAX in Banff, Alberta, Canada

May 10-12
WEFMAX in Savannah, Georgia
THE TILBURY WASTEWATER TREATMENT PLANT AND WETLANDS

Background
The Tilbury Wastewater Treatment Plant (WWTP) is located northwest of the community of Tilbury. It is situated just north of Highway 401 and east of Tilbury (Tremblay) Creek. The facility provides treatment of sewage collected from the community of Tilbury, which is located within the far west end of the Municipality of Chatham-Kent, at the border between Chatham-Kent and Essex County. The Public Utilities Commission for the Municipality of Chatham-Kent (Chatham-Kent PUC) operates the municipal water and wastewater facilities within the Municipality of Chatham-Kent in Ontario, Canada as well as for the Tilbury WWTP.

The Tilbury WWTP was previously known as the Tilbury Sewage Lagoons. The lagoons were built in the early 1960’s and then expanded in the early 1980’s. It was constructed to treat wastewater through a lagoon system, initially consisting of two lagoon cells and eventually a total of five lagoon cells. The treated effluent from the lagoons were continuously discharged into the adjacent Tilbury Creek from October 15th to May 15th each year. The Sewage Lagoons system was approaching its rated treatment capacity of 2,537 m³/d. The need for an upgrade of the Tilbury Lagoons was identified through the Chatham-Kent Water and Wastewater Master Plan study completed in May 2000. The Chatham-Kent PUC’s main goals for the plant upgrade were to increase wastewater treatment capacity to accommodate future growth and improve the effluent quality discharged to Tilbury Creek.

The Chatham-Kent PUC retained Dillon Consulting Limited to undertake the environmental assessment, design and contract administration for the project.

The facility improvements planned by the Chatham-Kent PUC allowed these original goals to be achieved. Based on the upgrade design choices made to date, some additional benefits were realized including:

- reduced odour due to the selection of an enclosed mechanical plant design
- reduced land requirements due to the smaller “footprint” of the proposed mechanical plant, and
- the decommissioning of lagoon cells and renaturalization of these areas through establishment of a new wetland ecosystem.

Construction of the new plant was started in November 2003 and was substantially completed in September 2005 at a construction cost of $11.9 million.

Description of Facilities
A new wet well pumping system with five submersible pumps was part of the new Lyon Avenue pumping station. The pump station was designed to accommodate storm events with a greater than 2 year return period (greater than approximately 32,000 m³/d.) Electrical controls and flow measuring instrumentation was located in the existing building that used to house the emergency generator for the pump station. A new self enclosed 273 kW standby diesel generator was installed. A new 450 mm diameter 1.4 km force main crossing
Waste sludge from this process is pumped approximately 32,000 m$^3$/d to the treatment plant. Wet weather flows, in excess of 14,672 m$^3$/d are sent, following headworks, to the existing lagoon cells 1 and 2 for temporary storage (for full treatment at a later time during low flow conditions). This diversion occurred several times during 2006. The aeration system in cells 1 and 2 were upgraded for this process.

The Secondary Treatment System for biological treatment of the wastewater is comprised of one oxidation ditch tank with an aeration system, two secondary clarifiers and a return activated waste sludge pumping system. The activated sludge process is an oxidation ditch technology (USFilter's Orbal process) with associated secondary clarifiers (2 units) to treat the average and peak dry weather flows of 5,434 m$^3$/d and 14,672 m$^3$/d, respectively. Waste sludge from this process is pumped to lagoon cells 1 and 2 for storage and treatment. Space has also been provided for a second oxidation ditch tank and two additional secondary clarifiers for future expansion beyond the 20-year planning horizon. Chemical dosage, in the form of alum, is used to remove phosphorus from the sewage.

The Tertiary Treatment Building is where the effluent from the secondary clarifiers is filtered and disinfected by ultraviolet light. Tertiary filtration was implemented to remove residual solids and associated BOD and phosphorus. The AquaDisk Pile Fabric disk filter (by Aqua-Aerobic Systems, Inc.) was used. It was one of the first installations in Ontario. The filters are two parallel, 4-disk rotating media cloth filter units. Filter backwash is pumped back to lagoon cells 1 and 2. This building also houses the return activated sludge pumps, the rack of ultraviolet lamps and equipment for gravity flow of the treated effluent into Tilbury Creek. The 137kW diesel generator relocated from the Lyon Avenue pumping station. Fibre optics is being used to communicate between the pump station and the WWTP.

Wetland Development for Decommissioning of Former Lagoons

The conventional approach to decommissioning the former lagoon cells would have been to drain them, allow time for the sludge to dry and then remove all of the sewage sludge to an appropriate site for land application or landfill disposal. Land application of the sludge required Ministry of the Environment (MOE) approval of the sludge material and a MOE Certificate of Approval for the receiving fields. Once the sludge was removed, soil would have been imported to cover the clay liner to provide sufficient topsoil to support plant growth. The sludge blanket depth in the former lagoon cells was between 0.3 and 0.6 m with an average solids concentration of 50 percent. The accumulated sludge quality met MOE Guideline requirements for agricultural disposal of biosolids but it was estimated the cost for this would be in the order of $3.41 million.

To find a more economical and attractive approach to site decommissioning, an alternative approach of developing a multipurpose constructed wetland within the cells was suggested. The plan was to provide a multi-functional wetland to decommission and rehabilitate lagoon cells 3, 4, and 5.

With the construction of the mechanical wastewater treatment plant, only a portion of the former lagoon lands were needed as part of the wastewater treatment plant operations. Cells 1 and 2 continue to have a role in the upgraded plant, as they were converted and used for storage and stabilization of waste sludge from the secondary treatment steps. The northern portion of Cell 3 was taken up by the mechanical plant, including the portion reserved for future expansion. The remaining lagoon lands - including Cells 4 and 5 and the southern half of Cell 3 - were decommissioned and rehabilitated.

The sludge material from Cells 1 and 2, and the northern portion of Cell 3 were transferred to Cells 4 and 5 and the southern portion of Cell 3.

The lagoon sludge was graded and contoured to serve as a growth media for the constructed wetland. Wetland plants were planted and irrigated with treated effluent from the new and control systems were installed to control and monitor the facilities at the mechanical treatment plant and at the Lyon Avenue pumping station.
A key feature of the wetland was a combination of shallow earthen berms and deep pools to promote a diverse aquatic habitat by providing varying water levels. To ensure mosquitoes do not become a problem, several deep pools provide year-round refuge to minnow species that predate on mosquito larvae. The wetland contours are laid out to provide the minnows with good access to all areas of the wetlands. Nearly 10 hectares (approx. 25 acres) of high quality wetland habitat were created.

Any excess discharge or accumulated precipitation will be returned to the treatment plant for treatment. Once established, the wetland will serve to stabilize the sludge and, with time, the sludge material will become completely incorporated into the wetland. At some point in the future, with confirmation of effluent quality and MOE approval, wetland effluent may be discharged directly to Tilbury Creek. Direct discharge to the creek will further enhance the wetlands value as habitat by providing additional nursery areas for fish and by augmenting base flows in the receiving stream.

Tilbury now has a fully mechanical plant that meets all regulatory requirements with a capacity that has been increased to allow future commercial, industrial and residential growth. The associated sludge containment wetland saved the Municipality of Chatham-Kent $2.25 M while providing a natural habitat for plant and wildlife.

Rob Bernardi, P.Eng.
Facilities & Systems Manager, Chatham-Kent PUC

HAVE YOU CONSIDERED AN RBC FOR YOUR NEXT WASTEWATER TREATMENT PLANT PROJECT?

WHY NOT?

ROTATING BIOLOGICAL CONTACTORS OFFER

- Extremely low power requirements.
- Low maintenance and operating costs.
- Consistent, high quality effluent
- BOD₅ and Ammonia removal on the same rotor
  (Nitrate removal in optional reactor)
- Resistance to washout and shock loads.
- Lowest life cycle costs of any treatment option.

P.J. HANNAH designs and manufactures the most robust RBC equipment in North America from packaged plants to stand alone rotors up to 4.5 metres in diameter (the largest in North America for BOD₅ removal).

If you haven’t considered RBC technology recently, maybe you should!

P.J. HANNAH Equipment Sales Corp.
Unit #26 - 151 Brunel Road, Mississauga, ON L4Z 2H6
Tel: 905-712-0620 Fax: 905-712-1240
1-800-353-3087
Unit #9, 8528 - 123 Street Surrey, BC V3W 3V6
Tel: 604-591-5999 Fax: 604-591-9925
1-800-663-6783

www.pjhannah.com mail@pjhannah.com
CAL END AR OF E NT E NTS

MARCH

Mar. 7 Operations Challenge Committee, WEAO Office, Milton 10:00 a.m.

Mar. 8 Conference Committee Meeting WEAO Office, Milton, 10:00 a.m.

Mar. 20 Board Meeting, R.V. Anderson offices, 9:30 a.m.

Mar. 27 Residuals & Biosolids Committee, WEAO Office, Milton 9:30 a.m.

Mar. 28 Operations Challenge Committee, WEAO Office, Milton, 10:00 a.m.

Mar. 29 Conference Committee Meeting WEAO Office, Milton, 10:00 a.m.

APRIL

Apr. 11 Operations Challenge Committee, WEAO Office, Milton 10:00 a.m.

Apr. 12 Conference Committee Meeting, WEAO Office, Milton 10:00 a.m.

Apr. 15 Board Meeting, President’s Suite, 1:00 p.m., London Hilton

Apr. 15 WEAO AGM, London Convention Centre, 4:00 p.m., London


MAY

May 1 Residuals & Biosolids Committee, WEAO Office, Milton 9:30 a.m.

May 4 Submission Deadline for INFLUENTS

JUNE

Jun. 2 INFLUENTS Release Date

AUGUST

Aug. 3 Submission Deadline for INFLUENTS

SEPTEMBER

Sep. 7 INFLUENTS Release Date

Sep. 20 WEAO Annual Golf Tournament, Shawnee Golf Club, Noon

OCTOBER

Oct. 13 Great Canadian Icebreaker, San Diego, 7:00 p.m.

Oct. 13-17 WEFTEC 07 ® San Diego Convention Center San Diego, California

NOVEMBER

Nov. 2 Submission Deadline for INFLUENTS

DECEMBER

Dec. 7 INFLUENTS Release Date

Check for updates on our web site www.weao.org
Two thirds of the earth's surface is covered by water.
The rest is covered by SEW-Eurodrive.

Manufacturers and Machine Builders in Canada and around the world look to SEW-Eurodrive for integrated drive solutions and round-the-clock service and support.

With three Canadian assembly plants and more inventory than all our competitors combined - we are the nation's leading supplier of Geared Motors, speed reducers and electronic controllers.

For the complete solution, call SEW-Eurodrive.

DRIVING THE WORLD.
www.sew-eurodrive.ca

CALL FOR
PLANT PROFILE SUBMISSIONS

Are you proud of your plant and the professionals who operate and maintain it?

LET THE WORLD KNOW!

Send us your PLANT PROFILE and, if selected, we will showcase it in an upcoming issue of INFLUENTS.

For more information contact: John Thompson at john.thompson@region.durham.on.ca
## Directory of Advertisers

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone</th>
<th>Website</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS Pumps Corp.</td>
<td>905-670-4677</td>
<td><a href="http://www.abspumps.com">www.abspumps.com</a></td>
<td>59</td>
</tr>
<tr>
<td>ACG Technology</td>
<td>905-856-1414</td>
<td><a href="http://www.acgtechnology.com">www.acgtechnology.com</a></td>
<td>57</td>
</tr>
<tr>
<td>Anachemia Science</td>
<td>800-361-0209</td>
<td><a href="http://www.anachemia.com">www.anachemia.com</a></td>
<td>64</td>
</tr>
<tr>
<td>Associated Engineering</td>
<td>416-622-9502</td>
<td><a href="http://www.ae.ca">www.ae.ca</a></td>
<td>79</td>
</tr>
<tr>
<td>Aquatic Life Ltd.</td>
<td>800-409-8378</td>
<td><a href="http://www.aquaticlife.ca">www.aquaticlife.ca</a></td>
<td>47</td>
</tr>
<tr>
<td>Astoria-Pacific</td>
<td>800-536-3111</td>
<td><a href="http://www.astoria-pacific.ca">www.astoria-pacific.ca</a></td>
<td>68</td>
</tr>
<tr>
<td>Avensys Solutions</td>
<td>888-965-4700</td>
<td><a href="http://www.avensys.com">www.avensys.com</a></td>
<td>63</td>
</tr>
<tr>
<td>C &amp; M Environmental Technologies Inc.</td>
<td>800-570-8779</td>
<td><a href="http://www.cmelt.com">www.cmelt.com</a></td>
<td>41</td>
</tr>
<tr>
<td>Cancopps Limited</td>
<td>800-595-0514</td>
<td><a href="http://www.cancopps.com">www.cancopps.com</a></td>
<td>6</td>
</tr>
<tr>
<td>C.C. Tatham &amp; Associates Ltd.</td>
<td>705-444-2565</td>
<td><a href="http://www.cctatham.com">www.cctatham.com</a></td>
<td>21</td>
</tr>
<tr>
<td>CH2M Hill Canada</td>
<td>416-499-9000</td>
<td><a href="http://www.ch2mhillcanada.com">www.ch2mhillcanada.com</a></td>
<td>7</td>
</tr>
<tr>
<td>Claessen Pumps Ltd.</td>
<td>705-431-8585</td>
<td><a href="http://www.claessenpumps.com">www.claessenpumps.com</a></td>
<td>7</td>
</tr>
<tr>
<td>ClearTech</td>
<td>800-387-7503</td>
<td><a href="http://www.cleartech.ca">www.cleartech.ca</a></td>
<td>75, 80</td>
</tr>
<tr>
<td>Control Microsystems</td>
<td>888-267-2232</td>
<td><a href="http://www.controlmicrosystems.com">www.controlmicrosystems.com</a></td>
<td>71</td>
</tr>
<tr>
<td>Corix Water Systems</td>
<td>800-500-8855</td>
<td><a href="http://www.corix.com">www.corix.com</a></td>
<td>2</td>
</tr>
<tr>
<td>Degremont Technologies Suez</td>
<td>800-446-1150</td>
<td><a href="http://www.inflicodegremont.com">www.inflicodegremont.com</a></td>
<td>35</td>
</tr>
<tr>
<td>DELCAN Water</td>
<td>905-943-0500</td>
<td><a href="http://www.delcan.net">www.delcan.net</a></td>
<td>29, 52</td>
</tr>
<tr>
<td>Douglas Barwick Inc.</td>
<td>613-342-8471</td>
<td><a href="http://www.douglasbarwick.com">www.douglasbarwick.com</a></td>
<td>45</td>
</tr>
<tr>
<td>EarthTech</td>
<td>905-886-7022</td>
<td><a href="http://www.earthtech.com">www.earthtech.com</a></td>
<td>58</td>
</tr>
<tr>
<td>ENV Treatment Systems Inc.</td>
<td>416-503-7639</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>EPIC</td>
<td>888-374-2338</td>
<td><a href="http://www.epic-edu.com">www.epic-edu.com</a></td>
<td>64</td>
</tr>
<tr>
<td>Giffels Associates Ltd.</td>
<td>800-567-8918</td>
<td><a href="http://www.giffels.com">www.giffels.com</a></td>
<td>34</td>
</tr>
<tr>
<td>H2Flow Equipment Inc.</td>
<td>905-660-9775</td>
<td><a href="http://www.h2flow.com">www.h2flow.com</a></td>
<td>14</td>
</tr>
<tr>
<td>Hydromantis, Inc.</td>
<td>519-624-7223</td>
<td><a href="http://www.hydromantis.com">www.hydromantis.com</a></td>
<td>77</td>
</tr>
<tr>
<td>IIT Flygt</td>
<td>514-695-0100</td>
<td><a href="http://www.iittflygt.ca">www.iittflygt.ca</a></td>
<td>31</td>
</tr>
<tr>
<td>John Brooks Company Limited</td>
<td>877-624-5757</td>
<td><a href="http://www.fluidhandling.com">www.fluidhandling.com</a></td>
<td>8, 68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone</th>
<th>Website</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Meunier Inc.</td>
<td>905-286-4846</td>
<td><a href="http://www.johnmeunier.com">www.johnmeunier.com</a></td>
<td>9</td>
</tr>
<tr>
<td>Kentain Products Ltd.</td>
<td>519-576-0994</td>
<td><a href="http://www.kentain.com">www.kentain.com</a></td>
<td>70</td>
</tr>
<tr>
<td>KMK Consultants Ltd.</td>
<td>905-459-4780</td>
<td><a href="http://www.kmk.ca">www.kmk.ca</a></td>
<td>11</td>
</tr>
<tr>
<td>KSB Pumps Inc.</td>
<td>905-568-9200</td>
<td><a href="http://www.ksb.ca">www.ksb.ca</a></td>
<td>51</td>
</tr>
<tr>
<td>Metcon Sales &amp; Engineering Ltd.</td>
<td>905-738-2355</td>
<td><a href="http://www.metconeng.com">www.metconeng.com</a></td>
<td>53</td>
</tr>
<tr>
<td>Parkson Corporation</td>
<td>514-636-8712</td>
<td><a href="http://www.parkson.com">www.parkson.com</a></td>
<td>67</td>
</tr>
<tr>
<td>Performance Fluid Equipment Inc.</td>
<td>866-683-7867</td>
<td><a href="http://www.performancequip.com">www.performancequip.com</a></td>
<td>49</td>
</tr>
<tr>
<td>PJ HANNAH</td>
<td>800-353-3087</td>
<td><a href="http://www.pjhannah.com">www.pjhannah.com</a></td>
<td>75</td>
</tr>
<tr>
<td>Pro Aqua + Shadrack Inc.</td>
<td>416-861-0237</td>
<td><a href="http://www.proaqua.ca">www.proaqua.ca</a></td>
<td>37</td>
</tr>
<tr>
<td>RMS Enviro Solv Inc.</td>
<td>877-767-7867</td>
<td><a href="http://www.rmsenviro.com">www.rmsenviro.com</a></td>
<td>6</td>
</tr>
<tr>
<td>RV Anderson Associates Ltd.</td>
<td>416-497-8600</td>
<td><a href="http://www.rvanderderson.com/">www.rvanderderson.com/</a></td>
<td>5</td>
</tr>
<tr>
<td>Sanitherm Engineering Limited</td>
<td>604-986-9168</td>
<td><a href="http://www.sanitherm.com">www.sanitherm.com</a></td>
<td>45</td>
</tr>
<tr>
<td>SEW Eurodrive</td>
<td>905-791-1553</td>
<td><a href="http://www.sew-eurodrive.ca">www.sew-eurodrive.ca</a></td>
<td>69, 77</td>
</tr>
<tr>
<td>Simpson Environmental Corporation</td>
<td>905-332-7669</td>
<td><a href="http://www.simpsonenvironmental.com">www.simpsonenvironmental.com</a></td>
<td>77</td>
</tr>
<tr>
<td>SPD Sales Ltd.</td>
<td>905-678-2882</td>
<td><a href="http://www.spdsales.com">www.spdsales.com</a></td>
<td>77</td>
</tr>
<tr>
<td>Stantec Consulting</td>
<td>416-229-4000</td>
<td><a href="http://www.stantec.com">www.stantec.com</a></td>
<td>55</td>
</tr>
<tr>
<td>Summa Engineering Ltd.</td>
<td>905-678-3388</td>
<td><a href="http://www.summaeng.com">www.summaeng.com</a></td>
<td>34</td>
</tr>
<tr>
<td>Terratec Environmental Ltd.</td>
<td>800-846-2097</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>The Thompson Rosemount Group</td>
<td>519-843-2552</td>
<td><a href="http://www.trg.ca">www.trg.ca</a></td>
<td>77</td>
</tr>
<tr>
<td>Trojan Technologies</td>
<td>905-660-9775</td>
<td><a href="http://www.trojanuv.com">www.trojanuv.com</a></td>
<td>15</td>
</tr>
<tr>
<td>Vector Process Equipment Inc.</td>
<td>416-527-4396</td>
<td><a href="http://www.vectorprocess.com">www.vectorprocess.com</a></td>
<td>46</td>
</tr>
<tr>
<td>Waterloo Biofilter Systems Inc.</td>
<td>519-856-0757</td>
<td><a href="http://www.waterloo-biofilter.com">www.waterloo-biofilter.com</a></td>
<td>69</td>
</tr>
<tr>
<td>WILO EMU</td>
<td>866-476-0323</td>
<td><a href="http://www.wilo-emu-usa.com">www.wilo-emu-usa.com</a></td>
<td>26</td>
</tr>
</tbody>
</table>
Considering a change? Join the Associated Engineering team!

Associated Engineering is a leading, employee-owned Canadian consulting engineering firm. We offer multi-disciplined engineering services in the water, environmental, infrastructure, and transportation sectors. We have immediate openings for the following positions:

**Civil/Infrastructure Engineers** - Burnaby, Kelowna, Calgary, Edmonton, Lethbridge, Toronto

**Municipal Engineers** - Burnaby, Kelowna, Edmonton, Red Deer, Regina, Saskatoon

**Water/Wastewater Engineers/Project Managers** - Burnaby, Kelowna, Calgary, Edmonton, Toronto

**Water & Wastewater Process Engineers** - Calgary, Saskatoon, Regina

**Water Resources Engineer** - Burnaby, Calgary

We're looking for motivated individuals who enjoy working in an energetic and dynamic environment on interesting and challenging projects. Associated Engineering promotes career advancement, personal growth, and work-life balance. We offer competitive salaries and benefits and a comprehensive continuing professional development program. For more information on these positions and positions in our other offices, visit our website at www.ae.ca.

Please submit resumes in confidence by April 30, 2007 to:

Ms. Karen Kinakin  
Associated Engineering  
300, 4940 Canada Way  
Burnaby, BC V5G 4M5  
Email: kinakink@ae.ca  
Fax: 604-291-6163

We thank all applicants, but will only contact those candidates selected for an interview.

Associated Engineering
GLOBAL PERSPECTIVE. LOCAL FOCUS.

Associated Engineering is an equal opportunity employer.
Did you know ClearTech is one of the leading suppliers of activated carbon in Canada?

ClearTech can

**Adsorb**

your impurities with the right carbon for your needs.

ClearTech is your complete supplier of water, air, and gold mining carbon from two of the world’s leading manufacturers. High quality granular, powdered, and pellet carbons are available in coal, wood, and coconut shell bases.

Carbon is stocked across Canada in all major centers from Toronto to Vancouver. Packaging sizes include: 1 cubic foot bags, 25kg bags, 500kg tote bags, and bulk pneumatic. On site service and installation is available. ClearTech is equipped to respond to all of your carbon needs.

---

**ClearTech**

Toronto · Winnipeg · Regina · Saskatoon · Edmonton · Calgary · Vancouver

1-800-387-7503

Check out our new website at [www.cleartech.ca](http://www.cleartech.ca)