

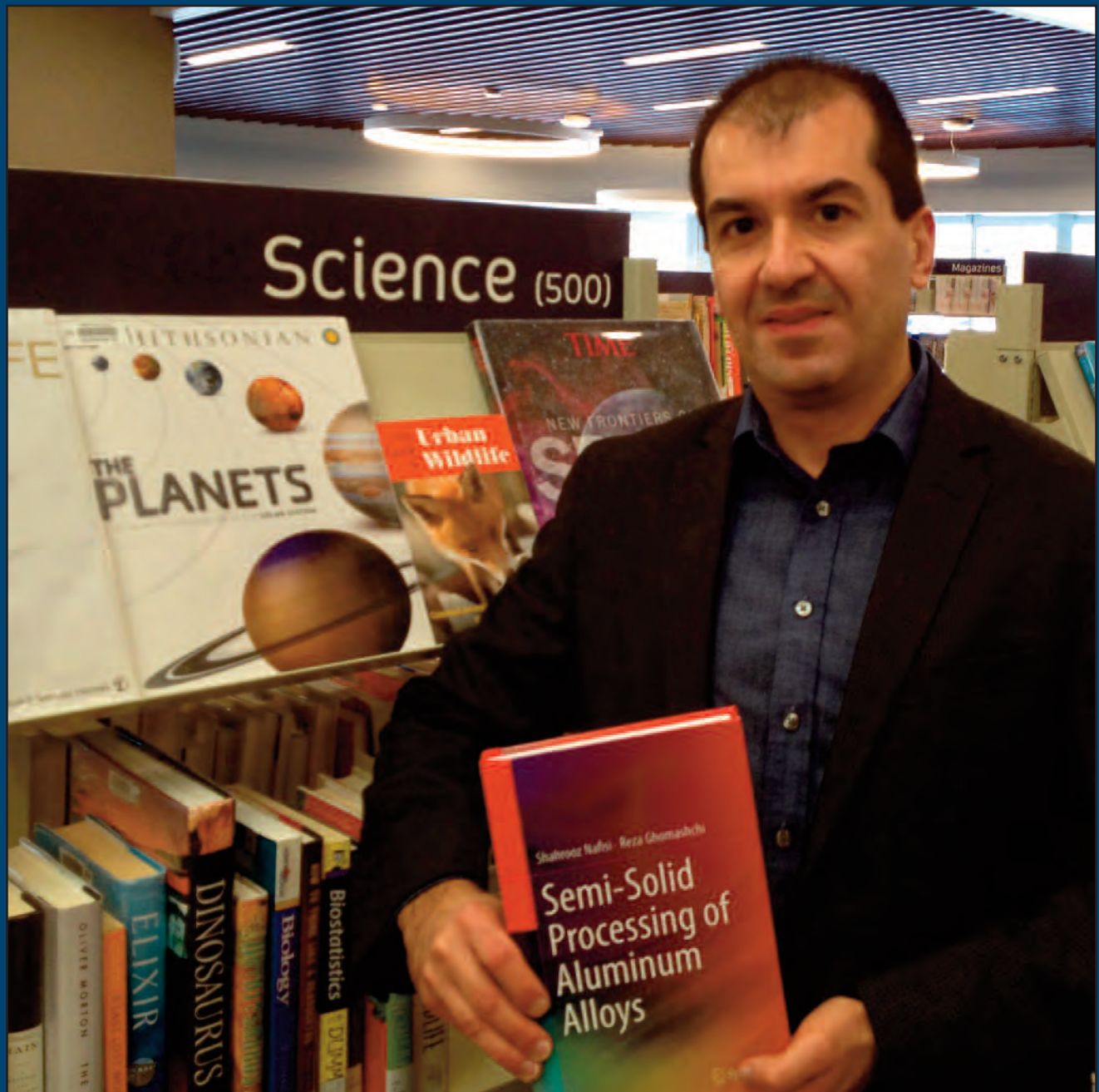
THE PROFESSIONAL



# EDGE

ISSUE 166

JANUARY/FEBRUARY 2017



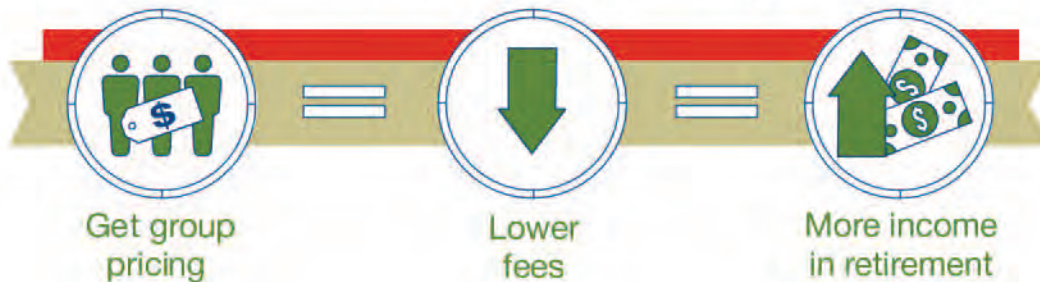
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# Table of Contents

ISSUE 166

JANUARY/FEBRUARY 2017

- 
- 05** President's Message
- 
- 15** Member Profile
- 
- 16** Calling All Members-in-Training  
This Applies to You
- 
- 17** Dream It! - Dream Big!
- 
- 18** Engineer Disciplined for  
Professional Incompetence  
and Professional Misconduct
- 
- 19** Professional Practice Exam
- 
- 24** Call for Council Nominations
- 
- 25** Notes from APEGGS Council
- 
- 26** On-line Profile
- 
- 27** CP Details
- 
- 29** MLA Reception
- 
- 30** Safety Moment
- 
- 31** The U of S Aerodesign Group
- 
- 32** Letter to the Editor
- 
- 33** News From The Field
- 
- 38** College Corner
- 
- 39** News Beyond Our Borders
- 
- 44** Calendar Of Events
- 

7



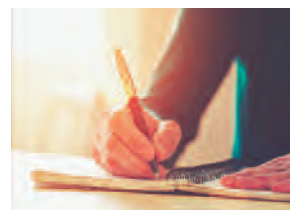
## PROFILES IN ACHIEVEMENT

Engineering and Geoscience Projects

20

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## President's Message



Engineering Regulators dinner at PNWER Economic Leadership Forum in Boise, Idaho (l to r): Doreen Wilson, Tara Zrymiak, P.Eng., FEC, Leah McDonald, Keith Simila, P.E., Executive Director Idaho Professional Engineers and Professional Land Surveyors, Shawna Argue, P.Eng., MBA, FEC, FCSSE, FGC(Hon), Colin Smith, P.Eng., FEC, CSSE, Past President APEGBC, Bob McDonald, P.Eng., MBA, LL.B., FEC, FGC (Hon.), FCSSE

I myself was caught like a deer in the headlights while sitting on the panel at the recent Women's History Month event in Regina when a member of the audience (none other than our own Past President Dwayne Gelowitz) asked us to describe something that we had done in our professional or volunteer lives that made us proud, and why. As I'm sure would happen to many of you, I drew a blank at first. I didn't think anything I had done was worthy of making me feel proud. I am grateful that my fellow panellists answered first to give me some time to think.

I'm happy to say that I did eventually come up with an answer. Afterwards, I thanked

Engineers and geoscientists are notoriously reluctant to brag about their accomplishments.

Dwayne for posing the question. As much as we don't always want to admit it, some of the things we do are worth bragging about and it's good to have someone force us to do so every now and then.

This edition of *The Professional Edge* is all about recognizing and celebrating great achievements made by some of the humble people who practise engineering and geoscience in our province and elsewhere. I was excited to have the opportunity to see two such remarkable achievements when I was in Charlottetown this past November attending the Engineers PEI Annual Meeting.

Prince Edward Island gets most of its power from New Brunswick through underwater cables. One of the professional development tracks was a field trip hosted by Maritime Electric to see where two new upgraded cables are in the process of being pulled across the Northumberland Strait to satisfy the increasing power needs of the island. It is 17.5 kilometres from the New Brunswick coast to a huge substation in Borden-Carleton, PEI. The *Isaac Newton*, a specialized ship from Sweden, can lay the cable over that distance in a single day followed by specially modified boats that take two weeks to dump gravel on top of the cable to bury it. Of course, the whole operation takes much longer than that because they need to wait for a long enough window of fairly ideal weather to complete each of the tasks precisely and safely.

I was also excited to finally get a chance to see the Confederation Bridge, especially with a personal tour by outgoing Engineers PEI



president Dave Taylor. This remarkable engineering achievement is the longest bridge over waters that freeze, which adds extra challenge due to the awesome power of moving ice. The piers of this bridge are therefore specially designed to be ice breakers to minimize damage when the strait is frozen. It was disconcerting to be looking at a bridge without being able to see the far end, because of its length and the slight curve that was apparently included in the design to help keep drivers awake on the 10-minute trip across. Wind also affects travel on the bridge, which can be subject to restrictions or closed altogether when wind speeds are too high.

We have equally amazing engineering and geoscience achievements to celebrate here in Saskatchewan. I encourage you also to check into the achievements highlighted in the following pages – everything from new and upgraded testing facilities to innovations in industrial and municipal works. Despite the economic downturn, our members are still finding ways to make a difference.

The previous edition of *The Edge* included the list of the ACEC-SK Awards of Distinction winners for 2016 – an impressive group of individuals and teams. A new award this year is the Mentor Award. I was thrilled to attend the event to see it awarded to Dave Kent, P.Eng., FEC who is the chief engineer at Clifton & Associates. Not only is Dave a technical specialist in many disciplines (and currently mentoring over 150 people), he also finds time to

volunteer as an APEGS Councillor. All of these are truly remarkable accomplishments but Dave’s main response to winning the mentorship award was to thank ACEC-SK for creating an award for something that he feels is so important. Congratulations Dave, and thank you for all you do!

One other event that I was pleased to attend recently was the Pacific Northwest Economic Region Economic Leadership Forum in Boise, Idaho in November. It was very interesting to participate in various types of sessions with delegates from the western provinces and the northwestern states, especially just one week after the American federal election. It is amazing how different the priorities and challenges are in Washington State, Idaho and Montana, even beyond the somewhat polarizing positions regarding federal politics. Despite these differences, the working group sessions were informative and productive and the engineering regulators reception was once again a social highlight.

The work featured in this magazine is only a small subset of all the great work being done in this province. I applaud all our members for their achievements over the last year. Your work is worthy of praise and accolades. Don’t be afraid to tell people about it!

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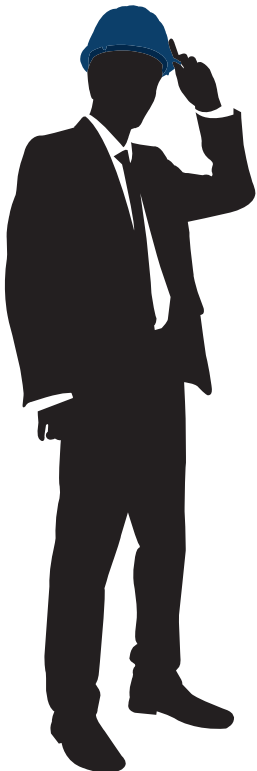
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# PROFILES IN ACHIEVEMENT

## Engineering and Geoscience Projects



Usually our job at *The Professional Edge* is telling Saskatchewan engineering and geoscience stories to APEGS members. This month we're turning the tables. We invited APEGS members to send us pictures and descriptions of their proudest achievements from 2016.

We want to thank the contributors to this special feature. For those of you who didn't contribute this year, we will be doing this again next year, so keep your cameras handy to capture your 2017 engineering or geoscience **success stories**.

# 2016



# PROFILES IN ACHIEVEMENT



## Chinook Power Project launched

### The Company:

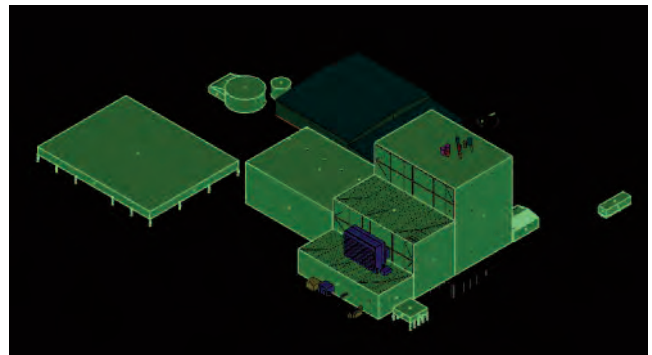
SaskPower is the principal supplier of electricity in Saskatchewan, serving more than 520,000 customers and managing over \$10 billion in assets. The company operates three coal-fired power stations, seven hydroelectric stations, six natural gas stations, two wind facilities, and manages purchase agreements with several alternative energy suppliers.

### The Accomplishment:

The Chinook Power Station is a 350 megawatt (MW) combined cycle natural gas facility to be constructed in the Rural Municipality of Swift Current.

SaskPower is building the station to meet the growing demand for power in the province, support the integration of intermittent renewable generation and provide replacement power for the retirement or refurbishment of conventional coal-fired generating units.

The Chinook Power Station is only one part of the development work in the Swift Current area. Transmission



and distribution power lines, an electrical switch yard and TransGas infrastructure are all required to make the overall project a success.

The planned in-service date is October 1, 2019.

### The Team:

The procurement, design and construction of the facility will be managed by Burns & McDonnell, an engineering, procurement and construction firm that was also involved in the 2015 expansion of the Queen Elizabeth Power Station in Saskatoon. They were selected as the result of a competitive procurement process in 2015.



## K+S Develops Innovative Tailings Storage



### The Company:

Headquartered in Saskatoon, K+S Potash Canada is part of the K+S Group, an international resources company that has been mining and processing mineral raw materials for more than 125 years.

K+S is bringing that experience and world-class expertise to work on the Legacy Project potash mine and production facility near Moose Jaw. This project brings new jobs and new opportunities – an investment in the province and people of Saskatchewan. The Legacy mine is scheduled to produce the first tonne of potash in the second quarter of 2017.

### The Achievement:

The process of solution potash mining involves pumping water underground to dissolve the potash which is then pumped back to the surface. But what happens to the fluid after the potash is dissolved and brought back to surface? The fluid has to be handled initially at surface before it can be pumped to the main plant for processing. The typical method in the industry (and the original design for the K+S Legacy project) is to manage this fluid in huge surface ponds.

Early on, K+S recognized that these ponds presented risks to the environment, wildlife and people. There was the potential danger of ground water contamination. The open fluids posed risks to waterfowl, other wildlife and to people working around the ponds.

Although there are a number of methods, approved by Environment Canada (most common are flagging and sound cannons), used in the industry to reduce these risks, they're not perfect and they require constant attention.

K+S decided to simply remove these risks. This was accomplished by changing the overall design so the fluids are kept in a combination of underground and surface storage tanks instead of ponds.

While this may seem like a simple solution, it required a significant change to the operational processes. A tanking system requires more equipment such as pumps, piping, tanks and instrumentation. This additional equipment makes the process more complicated but this trade-off is warranted when weighed against the positive effect this design change has on people and the environment.

Both the Saskatchewan Ministry of the Environment and Environment Canada welcomed the proposal.

### The Team:

Many professional engineers were involved in developing the new system. An initial feasibility study was conducted with three engineers from a third-party engineering firm. During the feasibility study four K+S engineers were involved in developing the operational and design concept as well as an overall project review. Once the feasibility of the project was approved, another third-party engineering firm employed approximately six civil, mechanical and electrical engineers to develop the detailed design while four K+S engineers reviewed these designs. Ultimately the project was constructed under the supervision of three project engineers. From the feasibility study to the completion of construction, this project would have involved more than 15 engineers across a variety of disciplines.



# 2016

# PROFILES IN ACHIEVEMENT



## Co-Op Refinery Complex Wastewater Improvement Project

### The Company:

Regina-based Co-op Refinery Complex (CRC) is a division of Federated Co-operatives Ltd. CRC's workforce of over 1,000 employees operates a world-class refinery that uses cutting-edge technology to produce 130,000 barrels of refined petroleum products per day. With an annual production capacity of 6.8 billion litres, CRC is one of Canada's largest refineries, distributing products to more than 780 retail gas bar and cardlock locations from Vancouver Island to northwestern Ontario.

### The Accomplishment:

After CRC's Section V Expansion, its use of water rose dramatically. It is using all the water from on-site wells and is now drawing on City of Regina water. CRC reached the limit of how much fresh water provincial regulators allow it to use. To continue to grow its business, CRC had to find a way to reduce its water use.

To meet this need, the CRC launched its ambitious Wastewater Improvement Project (WIP). Taking more than seven years and over \$200 million to build, this

cutting-edge environmental initiative is one of the largest megaprojects in Saskatchewan history.

The Wastewater Improvement Project, which became operational last spring, recycles water used by the Co-Op refinery. When fully operational, it will reduce the Refinery's wastewater by 65 per cent and reduce its need for fresh water by 28 per cent. That's the equivalent of the water used by 3,100 households.

But it's not just water use that's at stake. The wastewater treatment process also deals with pollutants being emitted into the atmosphere, particularly volatile organic compounds. This will be noticeable to those living in the neighbourhood near the refinery because it will reduce odours.

### The Team:

Over a dozen professional engineers worked on the WIP including Everett Rueve, P.Eng., Bill Bobyk, P.Eng., Simon Kostic, P. Eng., Greg Perron, P.Eng., Adam Dawe, P.Eng., Ben Cressman, Engineer-in-Training, Maxi Gruetzner, P.Eng., Craig Twardzik, P.Eng. and John Hilts, P.Eng.



## Saskatoon’s “Bridging to Tomorrow” Project



### The Project:

Saskatoon has long been known as the Bridge City. As the city expands and adapts to new traffic needs, it has had to face extensive change in river-crossing infrastructure. The Bridging to Tomorrow Project includes the construction of the North Commuter Parkway and replacement of the Traffic Bridge. Both bridges and surrounding road infrastructure is slated for completion in October of 2018.

### The Achievement:

The past year saw significant landmarks for both aspects of the project. Construction began on the North Commuter Parkway bridge in January of 2016.

Although building bridges is a task very commonly associated with the engineering profession, Saskatonians in 2016 were treated to feats of engineering that went in

the other direction – blowing bridges up. Through a combination of controlled explosives and dismantling the city’s obsolete 109-year-old Traffic Bridge was torn down in segments over the course of the year, with the final segment coming down in November.

### The Team:

Graham Commuter Partners (GCP) is the contractor in charge of construction.

# 2016

# PROFILES IN ACHIEVEMENT



## New Textbook on Semi-Solid Processing of Aluminum Alloys

### The Person:

A resident of Regina, Shahrooz Nafisi, Ph.D., P.Eng. is an adjunct professor of the University of Alberta. He received his Bachelor and Master of Science in metallurgical engineering from Iran University of Science and Technology and his Ph.D. from University of Quebec. He has authored and coauthored a number of books, articles and conference papers. In addition, he is the recipient of numerous awards including the 2014 Vanadium Award from the Institute of Materials, Minerals and Mining (IOM3), 2013 best paper award of International Metallographic Society and Metallography, Microstructures, and Analysis (IMS); and 2012 Association of Iron and Steel Technology (AIST) Hunt-Kelly Outstanding Paper Award.

Dr. Nafisi is former chair of the Canadian Casting Guild and former Technology chair of the Metallurgy - Steelmaking & Casting Technology / Continuous Casting Technology Committees of Association for Iron & Steel Technology "AIST". In addition to his academic work, he has provided extensive engineering work to EVRAZ in Regina.

### The Achievement:

Semi-solid metals (SSM) processing is a relatively new and effective alternative to the classical aluminum alloy manufacturing processes of casting and forging. While the method is gaining momentum, detailed knowledge of the method is not widespread. This book provides a vast amount of knowledge and know-how for SSM processes. This knowledge is mandatory for any researcher, technologist, or educator working on the topic of SSM. This book demonstrates the methods and tools necessary to achieve semi-solid metallic alloys. It also provides the reader with the fundamental knowledge on solidification and semi-solid metal processes.

This book is published by Springer Nature, world's largest academic book publisher, publisher of the world's highest impact journals and a pioneer in the field of open research.

### The Team:

Nafisi's book was co-authored by Reza Ghomashchi, Associate Professor at the University of Adelaide, Australia. As well, a chapter was contributed by Dr. Stephen Misdon, Midson group – Colorado School of Mines, on industrial application of SSM.



## SRC Centre for the Demonstration of Emissions Reductions



### The Institution:

The Saskatchewan Research Council (SRC) is one of Canada's leading providers of applied research, development and demonstration (RD&D) and technology commercialization. With more than 350 employees, over \$70 million in annual revenue and 69 years of RD&D experience, SRC provides products and services to its 1,900 clients in 20 countries around the world.

### The Achievement:

In order to sustain oil and gas production, new technologies will be required to meet increasingly stringent regulations and public expectations associated with industrial greenhouse gas (GHG) emissions. While carbon dioxide gas is a major concern, there is also an increased need to focus on methane emissions from the oil and gas sector. Industry is seeking effective new technologies to reduce emissions in line with emerging regulations.

The first of its kind in North America, the Centre for the Demonstration of Emissions Reductions (C-DER) will be a test and verification facility at SRC to help industry manage and reduce its GHG emissions. When fully operational, C-DER will be able to test, verify and demonstrate new GHG emissions-reducing technologies with a specific focus on methane in the petroleum industry, but also hydrogen sulphide as well as mono-

nitrogen oxides and sulphur oxides from oil and gas and other industries.

Since C-DER is enhancing and expanding on already existing capabilities at SRC, some services, such as GHG emissions detection, analysis and monitoring, will be made available to industry and government immediately. Additional capabilities and services will be developed and made available as the C-DER platform expands and evolves. In order to conduct field testing, a mobile facility is planned that can be connected to sources such as wells, tanks or production batteries and will work with equipment attached to operating wells.

### The Team:

The creation of C-DER came about thanks to the diligence of many science professionals among them a number of APEGS members including Kelly Knorr, P. Eng. (Operations Manager, Energy Division), Darren Anweiler, P. Eng. (Manager, Process Development, Energy Division) and Muhammad Imran, P. Eng. (Manager, EOR Field Development, Energy Division.)

# 2016

# PROFILES IN ACHIEVEMENT



## Team Power Solutions Impressive Growth in 2016

### The Company:

Team Power Solutions (TPS) is a multi-faceted electrical and instrumentation company offering engineering, commissioning, automation, major projects, manufacturing, and safety & technical training. Locally owned and operated, Team Power Solutions started with five partners in 2009 and has grown to 110 employees in 2016.

### The Accomplishment:

In the face of an economic downturn, when many industrial clients have cut back production forecasts and operations, Team Power Solutions has enjoyed strong growth. The TPS engineering department tripled in size over the past year and continues to grow. Initially, the engineering department was a resource center to complement the other departments (field service, manufacturing, instrumentation, major projects and training). In 2016, TPS Engineering became its own fully-functioning department to support a wider range of customers and large EPCM's.

TPS engineers work closely with many facets of a project -- from custom product manufacturing in the Saskatoon and Regina shop to field service support with TPS technicians during turn-key commissioning and start-up. This approach allows for consistency



**Ben Gibb, P. Eng., Engineering Supervisor,  
Team Power Solutions**

throughout the lifecycle of a project and provides a single point of contact for customers and partnered engineering consultants.



# Member Profile



This month *The Professional Edge* chats with Peter MacLachlan, P.Eng., a mechanical engineer who works out of Saskatoon as the General Manager for the northern region for TransGas Limited and SaskEnergy Incorporated.

## Tell us about your personal and professional background.

My parents and family started off in Toronto and eventually moved across Canada to Vancouver where I was born. Even though I was from Vancouver I pretty much grew up in Saskatoon.

## Why did you choose to go into engineering?

I was always good with math and science and enjoyed figuring out how things work. But I bet you get that answer from everybody.

In particular, I always enjoyed working on cars. In 1972, my father bought a kit car – a Porsche 917 body for a Volkswagen frame and engine. My three older brothers were the principle builders but I was able to help out along the way.

## What was your biggest challenge in college?

I started out in engineering right out of high school, where I soon found out I was not ready for university. I left university for a

couple of years and then went to SIAST and received a diploma in CAD-CAM engineering technology. I worked mainly as a draftsman. Eventually, I came to realize that there was more I wanted to do, so I went back to school as a mature student, as they say, and earned my engineering degree.

## What was your first job after college?

My first job after graduation was at SaskEnergy. That was back in 1991 during the recession and there were only a few of my class graduates able to get jobs in Saskatchewan at that time. I feel I was lucky to land the position with SaskEnergy and I've been with them ever since, although I've changed positions many times.

## What is your single greatest accomplishment as an engineer?

It's a rather technical achievement related to acoustics and sound dampening. I designed, built and implemented a pulsation dampening system for gas meter proving systems that was soon implemented by other Canadian gas utilities and Measurement Canada, the governing body for custody transfer measurement standards and procedures.

## What are your interests outside of work?

I am presently on the APEGS Academic Review Committee. I also volunteer my time as a judge for the fourth-year engineering student design projects. I'm always amazed at how well they're put together and how much thought goes into the designs, written documentation and the presentations. I also volunteer time for the annual elementary school cardboard boat races, which are always so entertaining from start to finish.

## Who has had the greatest influence on your life and career?

For my life, I would say my parents. They were great examples of how to work hard and treat everyone as you would want to be treated. My father was the head of Obstetrics and Gynecology department at the Royal University Hospital for over 25 years so he was a strong leader in the community. My mother was also a physician but retired from practice to raise our family. She did however return to medical school in the late 1970s where she specialized as a geneticist and became the first practicing geneticist in Saskatchewan at that time.

As for my career, I've had so many mentors that it's so difficult to narrow it down to one. In university, I had so many good professors - Owen Mann, Richard Brooks, Richard Burton, Dean Peter Nikiforuk, to try to name a few - who were tolerant of stupid questions but definitely enjoyed teaching and seeing students succeed.

# APEGS View



## Calling All Members-in-Training – this Applies to You

**Y**ou have been registered as a Member-in-Training with APEGS and you are now working on your experience reports and maybe even studying for the Professional Practice Exam. After many years of hard work and preparation, you can sit back and relax until you obtain the required four years of acceptable experience required to apply as a professional member. Your obligations are complete!

Wrong! The Continuing Professional Development (CPD) Program applies to both professional members and members-in-training. Members-In-Training are required to participate.

In 2015 only seven per cent of Members-In Training reported CPD Credits with APEGS. This is 132 members out of a total of 1,778. Because of this, the Professional Development Committee is looking at ways to increase awareness of the CPD Program with members-in training.

The CPD Program meets APEGS's statutory requirements as well as the professional obligations of our members. Section 5 of *The Engineering and Geoscience Professions Act* states that the objects of the Association are:

- a) to ensure the proficiency and competency of members in the practice of professional engineering or the practice of professional geoscience in order to safeguard the public;
- b) to regulate the practice of professional engineering and the practice of professional geoscience by members in accordance with this Act and the bylaws;
- c) to promote and improve the proficiency and competency of members;
- d) to foster the practice of professional engineering and the practice of professional geoscience by members in a manner that is in the public interest.

Subsections a), c) and in part d) speak directly to the need for a program such as CPD.

As well, subsection 20(2)(d) of the Regulatory Bylaws (the Code of Ethics) requires APEGS members to:

“keep themselves informed in order to maintain their competence, strive to advance the body of knowledge within which they practise and provide opportunities for professional development of their subordinates.”

This includes Members-in-Training. Learning does not stop after you have completed your formal university education.

The CPD Program provides members with a framework to plan and to report on their continuing professional development activities. There are six activity categories which include:

- Professional Practice
- Formal Activity
- Informal Activity
- Participation
- Presentations
- Contributions to Knowledge

Perhaps you are not working full-time or are on parental leave. With the variety of categories, you will likely be able to report something. Special consideration may be given to members in various situations.

As you read this at the start of 2017, take a moment to reflect on why you chose to become an engineer or geoscientist. Then review your activities for 2016 and submit your CPD credits for the past year if you have not done so already.

The Professional Development Committee is working on a plan for mandatory reporting. This topic will be further addressed in 2017 and 2018. For more information on the current program, refer to the Continuing Professional Development Member Guidelines available on the APEGS website.





# Dream It! - Dream Big!

SUBMITTED BY MARGARET-ANNE HODGES, CHAIR OF THE APEGS 30x30 TASK GROUP

If you were fortunate, as our family was, to take in *Rogue One* at the Saskatchewan Science Centre's Kramer IMAX Theatre, you were entertained by the latest and perhaps one of the best stories in the Star Wars filmverse: a classic heroine (hero) story of an ordinary person being plunged into a situation of significant consequence, only to be transformed due to great challenges, temptations and revelations and emerge with a victory.

While you could have seen the movie almost anywhere on the planet, I mention the Kramer IMAX Theatre because you would also have seen the trailer for the upcoming IMAX film *Dream Big*, a MacGillivray Freeman movie celebrating the real heroes and heroines among us – engineers!

The Science Centre announced the APEGS sponsorship of *Dream Big* back in November. *Dream Big* is the flagship programming event for 2017 30 by 30 initiatives and other APEGS events. The film features wondrous engineering achievements of the past (ancient structures), the present (modern masterpieces) and, most importantly, where vision, innovation and creativity will take us in the future.

## But there is more . . .

The project is so big, it is more than a movie—it's part of a movement aimed at bringing engineering into the forefront of our culture. *Dream Big* is the first giant-screen film to answer the call of the STEM (Science, Technology, Engineering, Math) initiative which aims to inspire kids of diverse backgrounds to become innovators who will improve the lives of people across our entire planet as we head into the 21st Century and beyond. That's why the film will be accompanied by ongoing educational, museum and

community efforts to expose young people from all backgrounds to what engineering is and what it can conjure in the world.

## [dreambigfilm.com](http://dreambigfilm.com)

APEGS is very happy to sponsor and partner with the Saskatchewan Science Centre to bring *Dream Big* to Saskatchewan. Watch for the official launch and announcement of 30 by 30 in February, and the first Dream Big event, Girls' Night Out, during National Engineering and Geoscience Week in March.

## Want to know more about *Dream Big - Engineering our World*?

- [dreambigfilm.com](http://dreambigfilm.com)
- [macgillivrayfreeman.com](http://macgillivrayfreeman.com)
- [discover.org](http://discover.org)
- [sasksciencecentre.com](http://sasksciencecentre.com)

P.S. Thanks to everyone who attended the Women of APEGS lunch at the Saskatoon Club on December 1st. It was great to see you!

P.P.S. Thanks to the members who attended the Women's History Month event, 20 Years of Professional Women's Leadership: Breaking Through the Barriers, on December 6th. And thanks to our panel consisting of the four APEGS women presidents, Margaret Kuzyk, P.Eng., FEC, FGC (Hon.) (1997 - 1998), Shawna Argue, P.Eng., FEC, FCSSE, FGC (Hon.) (2010-2011), Margaret Anne Hodges, P.Eng., FEC, FGC (Hon.) (2015–2016), and current President Tara Zrymiak, P.Eng., FEC. Our emcee for the night was Dr. Dena McMartin, P.Eng., FEC.

# Engineer Disciplined for Professional Incompetence and Professional Misconduct

A Professional Engineer was found guilty of professional incompetence and professional misconduct following a discipline hearing held on November 23, 2016. The discipline hearing resulted from the Council of the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) requesting the investigation of actions by James C. Hum, P.Eng. pursuant to section 32 of *The Engineering and Geoscience Professions Act* (the Act).

The APEGS Council met on October 11, 2013 and passed a motion requesting that the Investigation Committee initiate an investigation into allegations of professional misconduct and/or professional incompetence against James C. Hum, P.Eng. Council passed this motion with respect to the determination against James C. Hum, P.Eng. by a panel of the Discipline Committee of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) on July 8 and 9, 2013 and the subsequent order on penalty and costs from APEGBC on August 27, 2013.

There were four cases of conduct examined by APEGBC. The APEGBC panel found that:

- Guardrail Matter, the design of the guardrail did not comply with the BC Building Code and applicable CSA standards;
- Wall Matter, James C. Hum, P.Eng.'s inspection was deficient and his opinion was based on insufficient data and analysis;
- House Matter, the design of a retaining wall was grossly deficient and lacked necessary detail, there were deficiencies in the design with respect to seismic loads and there was insufficient geotechnical analysis with respect to the stability of excavated slopes; and
- Sign Matter, the design of the attachment of the sign to the building was deficient and incorrect analysis had been used.

The APEGBC Discipline Panel found that James C. Hum, P.Eng. was guilty of unprofessional conduct in his design, and to be non-compliant with the practice expected of a Professional Engineer practising in BC undertaking similar works at that time. The Saskatchewan Act does not use the terminology "unprofessional conduct." However, the APEGS Discipline Hearing Panel is of the view that James C. Hum, P.Eng.'s conduct in BC falls within the definition of "professional incompetence" under the Act. The APEGS Discipline Hearing Panel finds that James C. Hum, P.Eng.'s actions in BC displayed a:

- Lack of knowledge, skill and judgment; and

- Disregard for the welfare of members of the public served by the profession of a nature and extent that the member is unfit to continue in the practice of professional engineering in Saskatchewan.

The APEGS Discipline Hearing Panel found that Mr. James C. Hum, P.Eng. is guilty of professional incompetence within the meaning of section 29 of the Act.

Further, the APEGS Discipline Hearing Panel is of the view that James C. Hum, P.Eng.'s conduct, as evidenced above, was in violation of section 20(2)(b) of the Regulatory Bylaws and found him guilty of professional misconduct.

The Discipline Panel made the following order:

1. James C. Hum, P.Eng. is hereby reprimanded for professional incompetence and professional misconduct.
2. James C. Hum, P.Eng. is hereby suspended as a member of the Association of Professional Engineers and Geoscientists of Saskatchewan, and is hereby prohibited from using the title "Professional Engineer" and/or "P.Eng.," pending:
  - Compliance with existing disciplinary orders of APEGBC resulting in his being eligible for reinstatement as a member of APEGBC without conditions;
  - Compliance with existing disciplinary orders of APEGS and other jurisdictions resulting in his being eligible for reinstatement as a member in those jurisdictions without conditions;
  - Attendance at the Association's Law & Ethics Seminar and successful completion of the Association's Professional Practice Exam or similar exam administered by a Canadian provincial association of professional engineers, acceptable to the Association by December 31, 2017.
3. James C. Hum, P.Eng. is hereby ordered to pay a share of the investigation and discipline costs to the Association to a maximum amount of \$10,000, to be paid within 90 days of the date of this order, in accordance with Section 35(2)(a)(ii) of the Act.
4. That the particulars of this disposition and sentencing be published in *The Professional Edge*, with names.

Failure to comply with any of the foregoing orders of the Hearing Panel shall disqualify James C. Hum, P.Eng. from being eligible to apply for reinstatement of his membership in the Association of Professional Engineers and Geoscientists of Saskatchewan and he shall remain suspended until the orders have been complied with.



## Report on the Professional Practice Exam - 2016

SUBMITTED BY SHAWNA L. ARGUE, P.ENG., MBA, FEC, FCSSE, FGC(HON) – APEGS DIRECTOR OF EDUCATION AND COMPLIANCE

In 2016, 357 candidates wrote to The Professional Practice Exam, an increase of 13 candidates over 2015.

EXAM DATE	MAY 28	OCTOBER 22
# of Candidates	200	157
Highest Mark (%)	92%	91.5%
Average Mark (%)	77.6%	77.5%
# Failures *	2	1

\* The grade required to pass the exam is 65%.

### 2017 Registration, Seminar and Exam Dates

#### Spring 2017 Exam

**March 17, 2017** - Registration deadline for spring exam and seminar AND deadline for submission of post-bachelors work experience report (if none submitted previously.) The application form is available on the APEGS website. Note that Temporary Licensees who are writing the PPE do not have to submit any experience reports.

**March 17, 2017** - Last day to postpone or cancel seminar and/or exam (reapplication would be required in the future if you don't notify us by this date that you wish to postpone or cancel).

**April 21-22, 2017 - Law and Ethics Seminar** (Saskatoon)

**May 27, 2017, 9:00 am - Professional Practice Exam** (Regina and Saskatoon)

#### Fall 2017 Exam

August 11, 2017 - Registration deadline for spring exam and seminar AND deadline for submission of post-bachelors work experience report (if none submitted previously.) The application form is available on the APEGS website. Note that Temporary Licensees who are writing the PPE do not have to submit any experience reports.

**August 11, 2017** - Last day to postpone or cancel seminar and/or exam (reapplication would be required in the future if you don't notify us by this date that you wish to postpone or cancel).

**September 2017 - Law and Ethics Seminar** (Regina) – exact date to be announced in February 2017.

**November 4, 2017, 9:00 am - Professional Practice Exam** (Regina and Saskatoon).

The seminar runs from 8:00 a.m. to 7:30 p.m. on Friday and 8:00 a.m. to approximately 4:30 pm on Saturday. Complete exam information, including the application form and how to order textbooks, can be found at [www.apegs.ca](http://www.apegs.ca) under Apply, Professional Practice Exam.



Reboot  
your  
career

### Apply for 1 of 3

\$12,500 scholarships

from Engineers Canada and Manulife

#### Who's eligible?

Professional engineers returning to university for further study in an engineering field.

For Scholarship details and applications visit:

[engineerscanada.ca/scholarships](http://engineerscanada.ca/scholarships)

Deadline: **March 1, 2017**



\* The term ENGINEERING is an official mark owned by Engineers Canada. Manulife and the Block Design are trademarks of The Manufacturers Life Insurance Company and are used by it, and by its affiliates under licence. Manulife, P.O. Box 670, Stn Waterloo, Waterloo, Ontario N2J 4B8

# APEGS Spring 2017 Professional Development Days

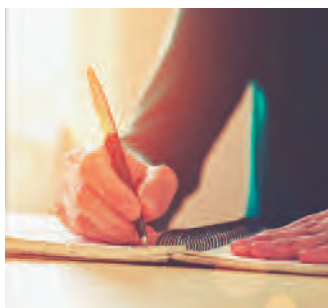
Delta Bessborough, Saskatoon | March 2 & 3, 2017

## Thursday, March 2, 2017

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8:00-8:30 **Registration**

8:30-10:00



### **Get to the Point!**

#### **A Practical Writing Course for Business and Technical Professionals** (RGI International)

This interactive two-day classroom session introduces participants to the Pyramid Method of Writing™ and applies it to writing effective letters, reports, emails, instructions and proposals. It offers an opportunity to receive feedback on one pre-course assignment and two post-course assignments. The second day allows time to discuss and evaluate longer, more technical documents such as recommendations, investigations, formal reports and studies and proposals. Group exercises allow participants to learn from each other.

- This course has sold out each time we have offered it!
- The student feedback has been outstanding
- 100% of the participants rated the course overall as EXCELLENT

*Lisa Moretto is the president of RGI International, Inc. with offices in Winnipeg, MB and Rochester, NY. She has 22 years of experience teaching business and technical communication courses for government agencies, private corporations, consulting firms and professional societies. She is an adjunct professor at the Rochester Institute for Technology, where she teaches technical writing, business communication, and effective technical communication. She is a Past President of the Rochester Engineering Society and contributes a monthly article to the RES Magazine. She is a member of the Society for Technical Communication and the IEEE Professional Communication Society.*

8:30-10:00



### **Geoscientists Canada - QP Short Course (APEGS)**

This short course will provide information on National Instrument 43-101 and 51-101. It is intended to inform practitioners working in the mineral and oil and gas resource exploration areas, using these instruments, on their duties as professionals working in these areas. It will provide background information as to what is required to become a Qualified Person with respect to these national instruments.

*Sandra Foster, P.Geo., FEC(Hon.), FGC is a professional geologist with over 35 years international experience in the mineral exploration and geoscience fields. Sandra is an independent consultant with a global practice specializing in generation of new mineral projects and the development of highly effective exploration teams. She has been an active member and volunteer with APEGS since 1999.*

*John Styles, P.Eng., FEC is president and CEO of Pilgrim Energy Inc., a private company engaged in business and finance consulting to the resource industry, and is founder and president of Outlaw Trail Spirits Inc., a craft distiller based in Regina. He also serves as principal with Auburn Energy Inc., a junior oil company, and has served as a sessional engineering instructor at the University of Regina since 2001. John has over 35 years of experience in the resource industry. He founded and/or has served on the boards of a number of public companies. John has been an active volunteer with APEGS, having served as Councillor for Group IV (2010-2013), and as a member of the Experience Review, Nominations, Academic Review and Professional Edge committees.*

10:00-10:15 **Coffee Break**

10:15-12:00 **Get to the Point! A Practical Writing Course for Business and Technical Professionals (continued)**

10:15-12:00 **Geoscientists Canada – QP Short Course (APEGS) (continued)**



- 12:00-1:00 **Luncheon Speaker: Compact of Mayors – Climate Change Initiatives Featuring Saskatoon Mayor Charlie Clark**  
NOTE – the lunch is only for those registered in the courses on this day.
- 1:15-2:45 **Get to the Point! A Practical Writing Course for Business and Technical Professionals** (*continued*)
- 1:15-2:45 **Geoscientists Canada – QP Short Course (APEGGS)** (*continued*)
- 2:45-3:00 **Coffee Break**
- 3:00- 4:30 **Get to the Point! A Practical Writing Course for Business and Technical Professionals** (*continued*)
- 3:00-4:30 **Geoscientists Canada – QP Short Course** (*continued*)

## Friday, March 3, 2017

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- 8:00-8:30 **Registration**
- 8:30-10:00 **Get to the Point! A Practical Writing Course for Business and Technical Professionals** (*continued*)
- 8:30-10:00 **Analysis of an Ethical Dilemma – “The Incident at Morales” (APEGGS)**  
The APEGGS Professional Development and Professional Practice Exam Committees are pleased to provide an ethics refresher for all practising engineers and geoscientists. Incident at Morales involves a variety of ethical issues faced by a company that wants to quickly build a plant in order to develop a new chemical product to gain an edge over the competition. Potential technical and ethical issues arise from equipment design, use of chemicals and facility siting. Because of environmental considerations related to the chemicals used in the process, the company decides to construct its plant in Mexico. Technical, environmental, financial and safety problems arise that involve ethical issues. This will be a facilitated interactive session with participants expected to fully discuss issues as they arise in the video presentation. Ryan M. MacGillivray, M.Sc., P. Eng., is the secretary-treasurer, senior design engineer and partner at the mechanical consulting firm Daniels-Wingerak Engineering Ltd., in Saskatoon. The firm specializes in mechanical system design for commercial and institutional buildings, including the Children’s Hospital of Saskatchewan, office buildings, nursing homes and university buildings.
- 10:00–10:15 **Coffee Break**
- 10:15–12:00 **Get to the Point! A Practical Writing Course for Business and Technical Professionals** (*continued*)
- 10:15–12:00 **Communication as Ethical Action** (UofS – Graham School of Professional Development, College of Engineering)  
Being an ethical professional means doing the right thing; however, much of our doing originates in communicating. This presentation explores how communication both builds our ethical character and helps us demonstrate that character in our personal and professional relationships. Jeanie Wills, Ph.D. teaches in the Graham School of Professional Development, College of Engineering. She also has a master’s degree and several years of practical communication experience gained through work in radio. She currently teaches interpersonal communication, negotiation and a foundational communication class. Deb Rolfes is the undergraduate program Chair in the Graham School of Professional Development and teaches the foundation communication class, oral rhetoric and the peer mentorship capstone class. She has been involved with APEGGS since 2006, first as a Public Appointee to Council and now on the Professional Edge Committee.
- 12:00-1:00 **Luncheon Speaker: APEGGS Continuing Professional Development Program (APEGGS)**  
All members of APEGGS are required to maintain their professional competency by undertaking professional development activities. APEGGS has made revisions to the requirements for Continuing Professional Development (CPD). This presentation will outline these changes and demonstrate how to report professional development activities. Marcia Fortier, P.Geo., A.Sc.T., has nine years of field experience in BC, AB, SK, MB and the Northwest Territories. Her most recent work experience has been on Phase I, II and III environmental site assessments and investigations within urban and rural areas of SK and MB as well as groundwater investigations for proposed industrial sites within SK. She has extensive experience in field supervision, data collection, interpretation and analysis of field data, environmental assessment and technical reporting writing. In addition, Ms. Fortier has five years of drafting experience in the environmental, mining, government, municipal and oil and gas sectors.  
NOTE – the lunch is only for those registered in the courses on this day.

- 1:00-2:45 **Get to the Point! A Practical Writing Course for Business and Technical Professionals** (continued)
- 1:00-2:45 **Don't Just Manage Change: Thrive in Constant Change!** (UofR – Continuing Education)  
 Today's organizations that are thriving never remain static. Change is no stranger to the managers, leaders and professionals in the engineering and geoscience fields. Change is constant, with contemporary considerations including change to business processes, communication methods and diversity in the workplace. Shari Hildred, PMP, and facilitator for career & professional development at the Centre for Continuing Education, University of Regina, will lead this interactive session that engages participants while exploring strategies to effectively manage in a changing environment. Concepts include presenting how changes affect us differently and exploring various areas including effective change management strategies for leaders; why change affects people differently; communication as the single most critical consideration in changing environments; and some practical tools to take away. Shari Hildred, PMP, is an instructor with the University of Regina for the Project Management Certificate Program and a senior cultural executive. Shari draws on expertise gained over 20 years of project and management experience in the private, public and non-profit sectors. Shari's background includes senior management experience within the Saskatchewan provincial government, private business ownership and the cultural, heritage and arts sectors where she focused on business analysis, financial management and project management in a variety of disciplines including finance, risk management, policy development, strategic planning, governance framework, operations, human resources, administration, information technology and facilities management.
- 2:45-3:00 **Coffee Break**
- 3:00-4:30 **Get to the Point! A Practical Writing Course for Business and Technical Professionals** (continued)
- 3:00-4:30 **Don't just manage change: Thrive in Constant Change!** (continued)

## Registration Information:

APEGS is pleased to be able to offer this affordable professional development opportunity as a benefit of APEGS membership. Attendance can be counted towards CPD credits under "formal activity." Participants will receive certificates of completion for each workshop attended.

EVENT	EARLY BIRD (PRIOR TO FEB. 10)	REGULAR	STUDENTS**	NON-MEMBERS
Get to the Point! (2 day course)	\$1,000	\$1,100	\$550	\$1,250
QP Short Course (1 day course)	\$200	\$250	\$100	\$350
Ethics (1/2 day – 2 sessions)	\$100	\$125	\$60	\$175
Change Management (1/2 day)	\$310	\$375	\$175	\$410

Registration fees include coffee breaks, lunch\* and all workshop materials. GST will be added to the above fees. To register for these events, please log-on to your On-line Profile on the APEGS website ([www.apegs.ca](http://www.apegs.ca)) and register under "Meetings."  
 (\* the luncheon sessions are only open to workshop registrants.) (\*\* must provide proof of being enrolled full-time)

## Looking for Accommodations?

APEGS has negotiated a rate of \$169.00/night, plus taxes, at the Delta Bessborough for March 2 & 3, 2017. Reservations can be made directly with Marriott Reservations at 1-888-890-3222 or 306-244-5521. Please ask for the APEGS block of rooms for the meetings being held on March 2 & 3.

## For More Information:

For more information, contact Shawna Argue, P.Eng., MBA, FEC, FCSSE, FGC(Hon.), Director of Education and Compliance at the APEGS office: 306-525-9547, toll free 1-800-500-9547, email: [sargue@apegs.ca](mailto:sargue@apegs.ca)

87th Annual Meeting and Professional Development Conference

# A Celebration of Unity Two Professions Working Together

**May 4-6, 2017** Hotel Saskatchewan, Regina SK



Registration will open in early 2017

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

## **Thursday, May 4**

Evening Welcome Event at the Saskatchewan Science Centre - including a viewing of the IMAX production *Deam Big*

## **Friday, May 5**

- Breakfast Keynote
- Plenary Session on Continuing Education
- Continuing Professional Development Streams
- Professional Development Luncheon
- Luncheon Keynote
- Past Presidents' Dinner
- President's Reception

## **Saturday, May 6**

- Business Meeting
- Partners Program
- Youth Science Day
- Volunteer Luncheon
- Awards Banquet



# Call for Council Nominations



## Nominating Committee

The Nominating Committee, chaired by Past President Margaret Anne Hodges, P.Eng., FEC, is soliciting names for the positions described below. You may contact staff support to the Nominating Committee, Shawna Argue, at [sargue@apegs.ca](mailto:sargue@apegs.ca) to propose names of potential candidates. Shawna may also be reached through the APEGS office in Regina by phone at 306-525-9547 (toll free 1-800-500-9547 North America), or facsimile 306-525-0851.

The Bylaws require the Nominating Committee to nominate, whenever possible, the person holding the office of president-elect for president, and one person for the position of President-Elect (typically the person holding the office of Vice-President). Ernie Barber, P.Eng., P.Ag. is the current President-Elect and Stormy Holmes, P.Eng., FEC is the current Vice-President. The Nominating Committee is also required to nominate, whenever possible, at least two persons for Vice-President and at least two persons for each vacancy on the Council.

## Submissions of Nominations

Any five members may nominate over their signatures an eligible nominee for any elective office except that of president. Such nominations shall be in the hands of the registrar at least forty-five days before the election is to take place. To meet this requirement, the nominations must be in the APEGS office no later than 5 p.m., Thursday, March 16, 2017, as the election will take place when ballots are counted on Monday, May 1, 2017, the “polling day.”

## 2017 Vacancies & Terms of Office

### Officers

- President-Elect – one-year term
- Vice-President – one-year term

### Group and Electoral District Councillors – to serve a three-year term

- Group VI (Chemical, Ceramic and Metallurgical)
- South-West District
- North District
- Geoscience North District

## 2017 Vacancies and Terms of Office

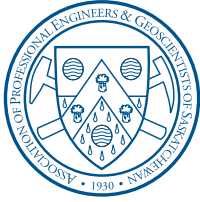
Only members in good standing are eligible for nomination. A person elected to Council may hold office only while a resident of Saskatchewan.

A person nominated for President-Elect must have served at least one full year (i.e. from the close of business at one annual meeting to the close of business at the next annual meeting) as a member of APEGS Council prior to the date on which they would assume office as President-Elect.

A person nominated as a representative of an electoral group must be classified with the Association in that electoral group. The Councillor representing Members-in-Training can complete the term of office after obtaining his or her P.Eng. or P.Geo. status.

For more information, visit:

[www.apegs.ca/Portal/Pages/council-elections](http://www.apegs.ca/Portal/Pages/council-elections)



## Notes from APEGS Council

The APEGS Council met Thursday, December 1 and Friday, December 2, 2016 at the Delta Bessborough Hotel in Saskatoon. 17 of 19 Councillors were present. Council is scheduled to meet next on February 2 and 3, 2017 at the Hotel Saskatchewan in Regina.

### **Council received the following presentations and information items:**

Activity updates were provided from the constituent society liaisons, the ACEC-SK Liaison, and the APEGS Directors to Engineers Canada and Geoscientists Canada.

The APEGS Director to Engineers Canada presented the Engineers Canada strategic plan. There are six themes: national voice, public protection; proactive regulation and integrity; valued profession, societal leadership and diversity and inclusion.

APEGS external legal counsel delivered a presentation on Council's responsibilities to hear reviews as laid out in the Act and Bylaws.

The APEGS Director of Registration provided an update on the database project and reported that Phase 1 had been completed and the Phase 2 costs and timelines had been confirmed.

The APEGS Director of Education and Compliance reported on the Pacific North West Economic Region 2016 Winter Economic Leadership Forum.

### **Council passed motions as follows:**

Providing recommendations to Engineers Canada: that the strategic plan include a preamble to clearly define that Engineers Canada's role is to support its owners – the regulators; and that wording be added to the quality assurance section clarifying that Engineers Canada supports the regulators in achieving these outcomes.

Establishing a task group to review the Engineers Canada strategic plan and map to the APEGS Value Proposition. The task group is to include Leo Niekamp, P.Eng., Andrew Lockwood, P.Eng., FEC, Tara Zrymiak, P.Eng., FEC (Chair) and Tina Maki, P.Eng., FEC, FGC (Hon.).

That project management experience alone is not acceptable in order to waive confirmatory exams. The majority of the work has to be direct experience in the application of theory.

Life Membership was approved for the following members: Brian W. Brownlee, P.Eng., Randall G. Gillies, P.Eng., Keith E. Hebil, P.Geo., William J. Miller, P.Eng., Shahram Missaghi, P.Eng.

Approving the amended terms of reference for the Discipline Committee.

Approving the amended policy Disc4.0 Publication of Discipline Committee Orders.

That the AMSoft Cloud database upgrade project proceed to Phase 2.

### **Council noted and received the following reports:**

Registrar's reports for September and October 2016.

The report on compliance activities for the period October 1 to November 18, 2016.

The unaudited financial statements for September and October 2016.

Board minutes and reports from the committees.

Committee member appointments: Kanyin Ogunrinde, P.Eng. to the Experience Review Committee; Malcolm Reeves, P.Eng., P.Geo., FEC, FGC to the Academic Review Committee; and Monica Tochor, P.Geo. to the Professional Practice Exam Committee.

## ON-LINE PROFILE:

# What is it good for?

For the last couple of years, APEGS has encouraged members and licensees to use their On-Line Profile to do the following:

- Pay annual fees
- Update contact information
- Renew Permission to Consult
- Report Continuing Professional Development credits (formerly called “Continuing Professional Excellence”)
- Volunteer for committees, one-time events and other activities
- Select mail and email exclusions, including constituent societies
- View application status
- Register for APEGS events and meetings

\* Items 1 and 2 can also be done by Official Reps and Authorized Signing Officers in the On-Line Profile of Certificates of Authorization.

Your On-Line Profile can be used at any time of the year to manage your information with APEGS.

### Winner of the iPad draw

APEGS held a draw for an iPad to encourage members and licensees to use their On-Line Profile to renew their registration and to update their information on record with APEGS. At least one of #1 to #6 listed above had to be completed in your On-Line Profile by December 31, 2016, and registration had to be renewed for 2017.

5,987 of the 9,832 members and licensees who renewed for 2017 were eligible for the draw.



### The winner is....

Dallas Mohagen, P.Eng.

Congratulations and thank you to all our members and licensees who used their On-Line Profile for renewals.

### Announcing the winner of the CPD contest

For the 2017 renewals, a draw was held for various gift certificates to encourage members and licensees to enter their Continuing Professional Development (CPD) credits on-line. To be eligible for the draws, members and licensees had to enter their CPD credits in their On-Line Profile by December 31, 2016.

### The winners are....

Malcolm (Niall) Wilson, Engineer-in-Training  
\$200 Saskatchewan Roughrider gift card

Thomas Sabourin, P.Eng.  
\$100 Visa gift card

Todd Collister, P.Eng.

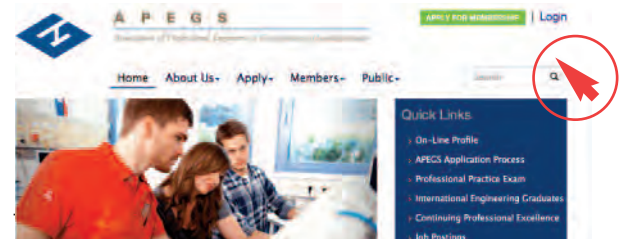
Gift certificate for a free day at an APEGS Professional Development event

Congratulations and thank you to all our members and licensees who entered their CPD credit in their On-Line Profile by December 31st.

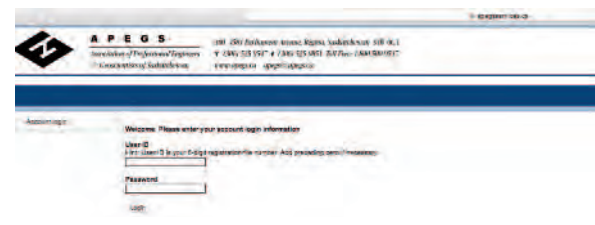
### How to access your On-Line Profile

Login at [www.apegs.ca](http://www.apegs.ca)

Top right corner of the APEGS home page – Login button:



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# CP Details

In this new section of *The Professional Edge*, we will be spotlighting members who have made a CPD report. We're trying to make a point – it's not so hard and sometimes it can even be fun!

**Each year, only a tiny fraction of APEGS members report their Continuing Professional Development (CPD) requirements. This is a serious problem that undermines the integrity of our profession.**



Brett Welder, P.Eng.

### About me:

I am the Manager, Health, Safety and Security (HSS) for K+S Potash Canada GP and work out of the company's Saskatoon office. Our team provides oversight and support on HSS-related matters and activities at our Legacy Project. We also provide support and oversight to the construction

management team that is constructing a potash handling facility at an existing shipping terminal in Port Moody, BC.

### What I do for CPD:

Formal activity – I attend various Certified courses or seminars related to the profession such as Radiation Safety Officer-ISO 9001 and 14001 Lead Auditor.

Informal - I go to industry and profession related conferences such as the Saskatchewan Safety Seminar and the Canadian Society of Safety Professionals Professional Development Day.

I also mentor younger professionals and make presentations at conferences and seminars.

### Memorable moment from a CPD experience:

I was registered for a course in Mississauga, ON this past October. As luck would have it, the Toronto Blue Jays ended up hosting the AL Wild Card Game against the Baltimore Orioles at that same time. I was able to purchase tickets to the game and be there for Edwin Encarnacion's 11th inning, game-winning homerun. My wife was able to get a couple of days off and join me for the game.

## Engineering Design Award



(l-r) Emma Fraser, Kaylee Hayko, Kailey Lowe and Tennille Kowalchuk. Photo courtesy of Mike Konieczny

A team of second-year students from the Faculty of Engineering and Applied Science has catapulted its way to top spot at a major design competition.

The team of four students finished first in the junior design division at the 2017 Western Engineering Competition held in

Banff, Alberta January 12 – 15. The Western Engineering Competition has been around since 1985 and brings together leading students from across Western Canada to “practice and exhibit their problem-solving, team-building, and communications skills.”

The prototype was required to be designed from typical craft items. The catapult outperformed all other university teams at the Western Engineering Competition in Banff.

Competitors were given four hours to brainstorm and build a prototype, which would aid search and rescue missions in the mountains surrounding Banff. The goal was to deliver supplies to stranded people before rescue personnel could arrive.

That was a tall order given the prototype was to be made from typical craft materials such as popsicle sticks, plastic cutlery, string, cups and clothespins.

The catapult was required to shoot supplies to a target at least six metres away. The U of R team outperformed all others, achieving a distance of a mere 14 centimetres from the target.

The U of R sent seven teams and a total of 22 students to the competition.

The U of R students were able to compete in Alberta thanks to the Association of Professional Engineers and Geoscientists of Saskatchewan, the Regina Engineering Students Society and the University of Regina Students Union. The students will now represent the University of Regina at the Canadian Engineering Competition at the University of Calgary in March 2017.

# Engineering and Geoscience Bursaries, Scholarships and Member Grants Available

The Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) is pleased to announce 14 annual bursaries and scholarships to be awarded at the University of Saskatchewan and the University of Regina and member grants to be awarded by APEGS.

## Entrance Bursaries

These bursaries are aimed at encouraging and assisting high school graduates entering the study of engineering or geoscience. These bursaries are particularly aimed at Aboriginal students who are under-represented in the professions.

- Two bursaries of \$3,625 (one for each university) to be applied towards first-year tuition in any field of engineering for a self-identified Aboriginal student.
- Two bursaries of \$2,750 (one for each university) to be applied towards first-year tuition in any field of geoscience for a self-identified Aboriginal student.
- Two bursaries of \$3,625 (one for each university) to be applied towards first-year tuition in any field of engineering for a student of any background.

## Undergraduate Scholarships

These academic performance and community participation-based scholarships are aimed at recognizing leadership and volunteerism among students currently enrolled in engineering or geoscience.

- Six scholarships of \$1,875 (three for each university) for current students of any field of engineering.
- Two scholarships of \$1,875 (one for each university) for current students of any field of geoscience.

## Graduate Students

These merit-based grants are aimed at encouraging existing APEGS members to further their education.

- Grants of \$7,500 for current APEGS members returning for post-graduate studies in fields of engineering, geosciences or an MBA program.



Professional Engineers and Geoscientists

**We See More.**



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

For more information, refer to the APEGS website:  
<http://www.apegs.ca/Portal/Pages/Scholarships-Bursaries-Grants>

# MLA reception



APEGS held its 16th annual MLA Reception on Wednesday, November 23, 2016 in Regina. The reception provides an opportunity for all MLAs to meet with members of the Association including Council, Past Presidents and committee Chairs. A variety of issues related to the engineering and geoscience professions were discussed in an informal setting.



APEGS President Tara Zrymiak, P.Eng., FEC presided over a short program which included greetings from Don Morgan, Deputy Premier, and Cathy Sproule, Saskatoon Nutana MLA. APEGS would like to thank the MLAs for attending this event and the volunteers for helping to make the event a success.



(left) The Honourable Don Morgan, Deputy Premier  
(right) Cathy Sproule, MLA Saskatoon Nutana



(left to right) Bob McDonald, P.Eng., MBA, LL.B, FEC, FGC (Hon.), FCSSE, APEGS Executive Director and Registrar, Muhammad Fiaz, MLA Regina Pasqua, APEGS Past President Pieter Van Vliet, P.Eng.



# Safety Moment



## WorkSafe Saskatchewan helps businesses build a foundation for a strong occupational health and safety program

**W**orkSafe Saskatchewan, in collaboration with the Canadian Centre for Occupational Health and Safety (CCOHS), introduced a new online tool to help small- and medium-sized businesses get the information they need to keep their workers safe in the workplace.

Launched in November 2016, the Foundational Pillars online tool makes it easier for employers to find the

information they need to develop, implement and maintain a solid health and safety program. Employers need basic information and this tool provides it all in one place. The tool makes it easier for employers to find information and learn their obligations and includes educational resources.

A strong and successful health and safety program is only as strong as its foundation.

The information is structured in pillars. The online tool is cost-effective, efficient and easy to navigate.

Currently, there are five pillars:

- Hazard assessment
- Practices and procedures
- Training
- Inspections
- Investigations

Each pillar is structured the same and no pillar is more or less important than another. Each pillar includes a summary of its function in a health and safety program; the legislation that explains the employers' responsibilities to facilitate and support that pillar; educational resources to learn more about that pillar; training resources provided by safety associations regarding that pillar; and resources that the employer can use to establish a health and safety program or to improve its existing program.

"By design, the Foundational Pillars online tool is not over-prescriptive," says Jack Hardy, manager of prevention services at the Saskatchewan Workers' Compensation Board. "We're giving employers access to education and training resources, tools and templates, legislation. We wanted to create awareness and eliminate obstacles for employers to resources and information."

Start with the Hazard Assessment pillar. Then you can develop practices and procedures, train workers and conduct inspections and investigations. This makes it easier for employers starting a health and safety program.

If it's training information an employer is looking for, or a template to record inspections, they can access resources quickly. Information includes health and safety forms and checklists. The minimal design of the forms encourages employers to download and customize resources to meet their needs.

WorkSafe Saskatchewan will continue to update and adapt the online tool. "The purpose of the Foundational Pillars is to help employers build a strong occupational health and safety program", says Mr. Hardy. "It will grow and change as employers build their health and safety programs."

To visit the site, go to [pillars.worksafesask.ca](http://pillars.worksafesask.ca).

## The U of S Aerodesign Group

BY RICK RETZLAFF, P.ENG., ASSISTANT PROFESSOR AND  
DIRECTOR OF SHAD, U OF S



**T**he U of S aerodesign group, first established in 1988, brought together engineering students from all disciplines interested in designing and producing airplanes. The club aimed to give members technical experience and hands-on use of the knowledge they were gaining through their respective degrees. The team competed annually for three years, placing fourth in their first ever competition. This early team's competition performance steadily improved and it set a new world record for the largest radio-controlled airborne weight of 30.5 pounds.

After 1990, the team competed off and on. The team has now evolved to include students from all colleges.

APEGS is proud to be the Gold Sponsor for the U of S Aerodesign Group.

Dear APEGS,

*As the faculty advisor for this group of talented young students, I would like to thank you very much for the funding you have provided. It certainly makes up the backbone that allows them to design, build and compete.*

*[The group] had a very successful year competing in California – they placed 11th out of 48 teams from all over the world.*

*I hope that with this funding, they will be even more successful this year.*

Regards, Rick

Rick Retzlaff, P.Eng.

Assistant Professor and Director of SHAD, U of S





**Letter to the editor:**

**SaskPower looking to the future**

Re.: News From the Field, issue 165, page 33, "SaskPower blowing wind proposal says proponent"

I'd like to take the opportunity to update APEGS members on SaskPower's plans for a sustainable power future.

Saskatchewan's population is at its highest level in history—over 1.15 million—and growing faster than it has in generations. At the same time, demand for power continues to grow and records for consumption continue to be set. By 2019, we'll need to supply enough additional electricity to power a city the size of Saskatoon. The development of cleaner electricity options is essential to Saskatchewan's continued economic growth, the health of our planet and the livelihood of our future generations.

SaskPower has worked to create a plan to increase the amount of renewable electricity in Saskatchewan's generation mix – from 25 per cent today to as much as 50 per cent by 2030. This will be done in a way that works for the people of our province, balancing the priority of reaching this target with making sure residents continue to have the power they need.

The next phase in our long-term plan will be procurement of wind and solar projects this year. SaskPower will use a competitive Request for Proposal (RFP) process, which is open to all qualified bidders, including interested community-based projects. An RFP is how we will find the best project at a competitive price that will provide reliable and cost-effective power to our system. SaskPower's plan is to add generation to our system when we need it to serve our customers – we have a plan to take us to 2030 and we will seek proposals as needed as that plan evolves.

SaskPower is committed to a fair and transparent procurement process for all generation projects, and we will make sure we follow the best practice and fairness standards to meet the needs of power producers and other stakeholders.

More information, including timelines, can be found at [www.saskpower.com/our-power-future/renewables-roadmap](http://www.saskpower.com/our-power-future/renewables-roadmap).

To support the addition of intermittent renewable generation, SaskPower will also add 350 MW of base-load natural gas-fired generation through the construction of Chinook Power Station near Swift Current. Site work has begun, with an expected on-line date of late 2019.

SaskPower is also looking at the potential for more hydro projects and hydro imports. SaskPower currently purchases 25 MW of electricity capacity from Manitoba Hydro to meet a growing demand for electricity in the province's Far North. There is also an agreement with Manitoba Hydro for 100 MW of clean hydro power beginning in 2020.

Our ultimate goal is to continue to produce and deliver reliable, sustainable, cost-effective power to the people of Saskatchewan.

Mike Marsh, SaskPower President & CEO



# News From The Field

## URANIUM AND NUCLEAR



www.lightources.org

### Denison looking forward with uranium

*Saskatoon StarPhoenix* - The Toronto-based company that owns 22.5 per cent of the McClean Lake uranium mill says it is gearing up to look for nuclear fuel on two northern Saskatchewan properties it acquired.

Denison Mines Corp., said it has completed the acquisition of two properties totalling almost 50,000 acres on the southern edge of the Athabasca Basin, west of Cameco Corp.'s McArthur River uranium mine.

Denison Mines acquired an 80 per cent stake in the 41,000-acre Hook Carter property from ALX Uranium Corp

The company also bought the 6,800-acre Coppin Lake property from Areva Resources Canada Inc. and UEX Corp. in a deal that closed in December. The Coppin Lake property is adjacent to its Hook Carter acquisition.

## UNIVERSITIES AND RESEARCH



www.retagriculture.com

### Swine trailers shouldn't be pig sties, says prof

*Farmscape.com* - A professor in the University of Saskatchewan's College of Engineering says a redesign of swine transport trailers is ultimately needed to make them easier and more economical to clean.

This is part of a project being conducted on behalf of Swine Innovation Park the University of Saskatchewan, Prairie Swine Centre, VIDO-InterVac and the Prairie Agricultural Machinery Institute aimed at reducing the time it takes and the costs associated with washing and disinfecting swine transportation equipment and ultimately automating the system.

Dr. Terry Fonstad, P.Eng. a professor in the College of Engineering at the University of Saskatchewan, says a study conducted by the Prairie Swine Centre, which looked at swine transport trailers from an animal husbandry and cleanability standpoint, found that many of the trailers used to move swine are retrofitted cattle trailers and, while they do work, they are really hard to clean.

Dr. Fonstad says the current challenge is to design a system to clean the trailers in use now but ultimately we need to work with the trailer manufacturers and the industry to build trailers that are more conducive to biosecurity.

### Calling Galaxy: CLS research may stop exploding batteries

*CBC* - Research at the Canadian Light Source synchrotron on the campus of the University of Saskatchewan could help stop a big battery problem before it starts.

These days, many gadgets, from hoverboards to cellphones to electric cars use lithium-ion batteries. The rechargeable batteries can hold big charges for hours, something that's more and more important in the tech world.

But there's a problem. Every so often, these batteries pillow. The

components inside the battery generates gas, which makes the outside of the battery swell. Pillowing can not only decrease battery performance, it can cause the battery to leak, or, in some cases, explode.

That's where Toby Bond comes in. An energy storage researcher at the synchrotron, Bond is using the machine to make highly-detailed CT scans on the batteries before and after pillowing happens.

Many of these lithium-ion batteries are built by a jellyroll process, where electrodes are wrapped in a circle. The process creates many energy-producing layers, but Bond also found it can increase pillowing.

Bond found that most of the battery problems happen in the flat parts of the jellyroll, especially where there were already defects in the battery's shape.

He hopes that the research can be used to improve battery design and how they respond to stressful conditions.

### Sask gets its maps straight

*DirectionsMag.com* - Esri Canada, a distributor of enterprise geographic information technology, recognized the Government of Saskatchewan with an Award of Excellence for its outstanding use of geographic information system (GIS) technology.

The government leveraged GIS for the Saskatchewan Enterprise Geo Database project, a spatial data warehouse that consolidates more than 350 datasets from various government archives and makes the information widely available.

Before the consolidated geodatabase came online earlier this year, all the government's datasets were managed in separate systems, which greatly hindered sharing the data. This siloed approach led to costly data duplication, inaccuracies and productivity losses, as staff struggled to find information and verify its accuracy.

The provincial government has already put its new spatial data warehouse to good use by offering a selection of maps and datasets related to the environment, agriculture, forestry, geology, health and social services, mining, recreation, transportation, wildlife and other topics available on its website.

## INFRASTRUCTURE

### Commodity hub proposed for Weyburn area

*Manitoba Cooperator.com* - A group in southeastern Saskatchewan is gauging farmer support for a proposed



SkyscraperPage Forum

new commodity hub project that would handle grain and transloading of commodities such as crude oil and fertilizer.

Comtrax Logistics Solutions proposes a \$50-\$75 million project somewhere on Canadian Pacific Railway's Soo Line, most likely in the Weyburn area, including a 60,000-tonne capacity crop handling facility and 260-rail car capacity loop track.

If interest is deemed sufficient, shares in the proposed project would be sold to producers at a later date. Comtrax's plan so far also calls for a significant portion of funds to be raised through commercial partnerships.

The concept calls for the Comtrax facility to operate as a fee-for-service public house, also offering the ability to unload products imported to the region. The site is envisioned as also handling crude oil, aggregate, fertilizer and other commodities.

The grain elevator component also calls for half or more of the facility's capacity to be available as condo grain storage for use by commercial grain traders, handlers or end-users.

The hub proposal wouldn't be the first for Saskatchewan's oil-rich southeast. Toronto-based Ceres Global Ag Corp. has been developing such a hub for grain, oil and other commodities at Northgate, about 60 km southeast of Estevan.

### Applications open for water infrastructure projects

*Journal of Commerce* - The government of Saskatchewan is now accepting online applications for infrastructure projects under both the Clean Water and Wastewater Fund (CWWF) and the Provincial Territorial Infrastructure Component (PTIC) of the New Building Canada Fund.

The CWWF, which was announced this September, will see Saskatchewan receive \$89.3 million in funding from the government of Canada over two to three years during Phase One.

Saskatchewan has committed to providing an additional \$44.2 million for water, wastewater and stormwater projects. Eligible project costs will be funded up to 50 per cent by the federal government and 25 per cent by the provincial government, with the eligible recipient responsible for the remaining costs.

PTIC, a 10-year program announced in 2014, will see \$240.2 million in federal funding for eligible PTIC applicants. These projects are funded one-third each by the federal government, the provincial government and eligible recipients.

During the first intake of this program, more than 50 projects with total eligible costs of more than \$233.3 million were approved.

### **RM's capture kudos for water co-operation**

*Canora Courier* - The RMs of Sliding Hills, Wallace, Calder, Saltcoats and Churchbridge and the Village of Rhein are six of the 10 Saskatchewan municipalities to win this year's Saskatchewan Municipal Awards which recognize innovation and excellence in Saskatchewan local government.

The six municipalities received the award for regional co-operation for having founded a watershed association to proactively manage water resources to reduce flood damage to agricultural land and protect private property and municipal infrastructure.

The awards were distributed to the winning rural municipalities at the SARM (Saskatchewan Association of Rural Municipalities) mid-term convention in November.

### **PA's sweet water beats the odds**

*Canadian Press* - Prince Albert placed second overall in the American Water Works Association Best of the Best water taste test competition held in Calgary in October. Municipalities in Saskatchewan, Manitoba and Alberta took part in the annual competition.

The manager of Prince Albert's water treatment plant says it's especially significant given the challenges the city faced this summer due to the oil spill. In July, a Husky Energy pipeline leaked 225 000 litres of blended crude oil into the North Saskatchewan River, forcing Prince Albert and North Battleford to find other sources of water.

The treatment plant manager said the city had to scramble to secure alternative water sources through the construction of new temporary water lines and use innovative treatment methods to treat the water sources for safe public consumption.

## **OIL AND GAS**

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### **NEB gets overhaul**

CBC - Natural Resources Minister Jim Carr has appointed a five-member panel to consult with Canadians and produce



penelope4ontario.ca

recommendations on how to reform the National Energy Board (NEB.)

The group will examine the structure, role and mandate of the NEB, which has become embroiled in controversy over its reviews of contested oil pipeline proposals.

The panel is to report to Carr by March 31.

The NEB's consultations in Montreal over the proposed TransCanada Energy East Pipeline Project were stopped in August by disruptive protests, prompting a temporary shutdown of the consultation process.

The three members of the NEB who were reviewing the project also recused themselves after reports surfaced that they had met with lobbyists, including Quebec's former premier Jean Charest, who were pushing the pipeline. They are still NEB board members and have since been reassigned to review other projects.

### **Pipeline laws get laid down**

*Regina Leader-Post* - Four years after a damning auditor's report and four months after a major oil spill, the provincial government introduced legislation to beef up pipeline safety across Saskatchewan.

*The Pipelines Amendment Act* replaces the 18-year-old Pipelines Act and includes stiffer penalties for offenders, new safeguards to ensure companies cover the cost of incidents and new inspection and compliance power for government officials.

The legislation, which will be phased in over time, also creates a framework to license 80,000 flow lines – which connect wellheads to larger pipelines – in the province.

In 2014, the Provincial Auditor said the province had implemented two of seven recommendations in her initial report on pipeline safety and had partially implemented two others. Government officials said in August they were “working on” the remaining recommendations.





### Refinery proposed for Sask. oilpatch

*Regina Leader-Post* - Stoughton, a town of 700 located about 140 kilometres southeast of Regina in the heart of the Bakken light oil play, could someday be the site of a 40,000 barrel-a-day (bpd) oil refinery worth an estimated \$600 million, according to representatives with Quantum Energy, an over-the-counter traded energy company based in Tempe, Arizona.

Quantum Energy Inc. announced the incorporation of a wholly owned Canadian subsidiary, Dominion Energy Processing Group Inc., “to conduct the development, construction and operation of a 40,000 bpd full slate refinery in Saskatchewan”.

Dominion is headed by Keith Stemler, who has 35 years of construction and senior project management experience in Western Canada’s natural resources sector, including multi-billion dollar capital projects for major bitumen producers, such as ExxonMobil, Husky Energy and Suncor, the release said.

Stemler said the company has been working with the Ministry of the Economy for about 18 months on the proposed refinery project.

Stemler said typically these plants cost from \$500 million to \$1 billion, although he estimated the cost of the Stoughton project at about \$600 million.

### Husky eyes steam assisted oil extraction in Sask.

*Saskatoon StarPhoenix* - Husky Energy plans to spend more than \$1 billion on three new steam-assisted heavy oil extraction plants in Saskatchewan as part of its ongoing transition to “low sustaining capital” operations.

Husky Energy Inc.’s board of directors sanctioned one new \$350-million plant, which can produce 10,000 barrels of heavy crude per day, at Dee Valley near Maidstone and two near the Hamlet of Spruce Lake, the company said.

The plants are similar to the Calgary-based company’s steam-assisted plants near Edam and Vawn, which came online this year. The plants are expected to begin operations in 2020 and employ 30 people each.

Construction of a fourth plant, the company’s second near Rush Lake in southwest Saskatchewan, is also underway, with production slated to begin in 2019.

Husky said in October that it has identified but not yet sanctioned an additional 17 steam-assisted heavy oil plants in Saskatchewan and Alberta, representing 150,000 barrels-per-day of new production, that could be brought over time.

The company’s projects in the Lloydminster region of western Saskatchewan and northeastern Alberta feed its upgrader in Lloydminster, which converts heavy crude into the synthetic oil used to produce diesel and gasoline.



### Sask. continues top marks for oil and gas investment

*Estevan Mercury* - Saskatchewan continues to receive high marks in the Fraser Institute’s Global Petroleum Survey, which ranks the best jurisdictions for oil and gas investment in the world.

The report, released by the think-tank on December 6, rates Saskatchewan as the number four jurisdiction in North America, trailing only Oklahoma, Texas and Kansas. Saskatchewan advanced three spots from seventh in 2015 to fourth this year. The Fraser Institute has ranked Saskatchewan as the top area for investment in Canada for five consecutive years.

Saskatchewan earned high marks from petroleum executives in the areas of fiscal terms, the cost of regulatory compliance and clear environmental regulations.

## ENVIRONMENT

### Riverbank shifts common, says U of S geologist

*CBC* - Ground movement that led to a break in a Husky Energy oil pipeline happens often along Saskatchewan



www.ibmne.eu

riverbanks, according to a geology engineer at the University of Saskatchewan.

Grant Ferguson, P.Ge., Engineering Licensee an associate professor in civil geological and environmental engineering with the U of S, said ground movement and slope failures along the riverbank are common and all infrastructure near the rivers is at risk of ground movement.

He said all infrastructure built near the riverbank is susceptible to ground movement and engineering studies should be done to help assess the risk of slope instability.

“We know that when the water tables come up, the soils become weaker and these things are more likely to happen,” Ferguson said, adding that although engineers deemed the site for the pipeline inactive, “... over time conditions changed.”

## MINING

### De Beers out but diamonds still sparkle

*Mining.com* - The Athabasca Basin of northern Saskatchewan is best known for its substantial uranium deposits, but De Beers hoped to discover diamonds there too.

In late December, the world’s largest diamond miner decided that several exploration targets in the area are not diamond-bearing. The revelation means that De Beers will stop drilling and return the 43,000-acre (17,401-hectare) property to CanAlaska Uranium, the Vancouver-based junior from which it optioned the property back in June.

De Beers is estimated to have spent up to \$20 million over seven years to explore the targets which had kimberlite (diamond-like) qualities identified in a 2011 Saskatchewan Geological Survey.

CanAlaka Uranium maintains the Western Athabasca Basin has “the right geological and structural setting “ ... and will keep exploring the remaining 78 targets for diamonds.



Athabasca River Basin Research Institute

### Buoyant helium market hits SW Sask

CBC - A shakeup in the global helium market has sparked an exploration rush in southern Saskatchewan, where the gas can be found in the province’s Precambrian basement, trapped in rock that’s about 1.8 billion years old.

Not just the stuff of birthday balloons, helium is a workhorse of an element, supplying an industry worth an estimated \$4.7 billion US. It gives airships a lift and helps deep sea divers breathe safely. It’s also used in rocket engines, nuclear plants and MRI scanners, and has a growing number of high-tech applications.

In the 1960s, when helium was considered a strategic military resource, the U.S. government built up an underground stockpile in Texas. That reserve has supplied almost three-quarters of US demand but the government has said it wants out of the commercial helium business by 2021.

As the US federal supply dwindles, industrial gas companies are looking north to fill the gap. Saskatchewan issued 59 helium leases in 2016; it didn’t issue any the year before.

Weil Group Resources tapped two old natural gas wells near the village of Mankota, in southwestern Saskatchewan. Earlier this year, the Virginia-based company started up a high-grade helium-processing plant in the area.

The plant is not a big local employer — only two operators are needed to run it — but Saskatchewan’s fledgling helium-refining industry is getting a toehold at a time when the province could use the business.

Canada has the fifth-largest helium resource in the world, behind the U.S., Qatar, Algeria and Russia, according to the U.S. Geological Survey.

# College Corner

## Faculty of Engineering and Applied Science, University of Regina

University of Regina Engineering students received a number of recognitions and awards over the past few months:

- **Diego Castro-Hernandez**, Electronics Systems Engineering Ph.D. candidate supervised by Dr. Raman Paranjape, won the best student paper at the 117th International Network Strategy and Planning Symposium September 26-28, 2016, for his paper "Walk Test Simulator for LTE/LTE-A Network Planning".
- **Skyler Nicholas Hladun** won the University Prize in Engineering and Applied Science and the Dean's Medal, awarded at the University of Regina's 43rd Fall Convocation on Friday, Oct. 21.
- **Dr. Zhong Li**, EVSE graduated under Dr. Gordon Huang, was awarded the President's Distinguished Graduate Award, announced at the University of Regina's 43rd Fall Convocation on Friday, October 21.

At the research front, a number of faculty members received external research funding from the SK Ministry of Environment (Dr. Gordon Huang), Mitacs Accelerate Program (Drs. Gordon Huang and Mehran Mehrandezh), SaskTel (Dr. Raman Paranjape), PetroTech Engineering (Qinddao) Co. Ltd. (Dr. Tony Yang), Natural Resources Canada (Dr. Dena McMartin) and the Sylvia Fedoruk Canadian Centre for Nuclear Innovation: (Drs. Irfan Al-Anbagi, Esam Hussein, Gordon Huang, Babak Mehran, Dena McMartin and Satish Sharma, and Mr. Doug Wagner); along with Drs. Grant Ferguson, and Ramakrishna (Rama) Gokaraju (U of S Engineering) and Dr. Joseph Piwowar (U of R Arts), Drs. Stephen Bend, Janis Dale and Kathryn Bethune (U of R Science), and Dr. Dwight Newman (U of S Law).

The faculty introduced in the fall a new research seminar series. Four presentations were made:

- Applications of Artificial Intelligence Technologies for Analysis and Modeling of Industrial Systems, Dr. Christine Chan, December 19.



Mindset and Perception: Engineering versus Intuitive Thinking, Dr. Esam Hussein

- Mindset and Perception: Engineering versus Intuitive Thinking, Dr. Esam Hussein, Nov. 21.
- Modeling of energy and environmental systems, Dr. Gordon Huang, Oct. 31.
- Meeting the 1.5 C UNFCCC scenario: The role of Carbon Capture and Storage (CCS) in the U.K. Dr. Iain Macdonald, Imperial College Centre for Carbon Capture and Storage (IC4S), Sept. 16.

Please email [amr.henni@uregina.ca](mailto:amr.henni@uregina.ca), if you are interested in receiving notifications for incoming seminars.

The faculty also hosted a symposium entitled "The Smart Grid and the Evolution of the Power System," on September 23, presented by the South Saskatchewan Section of the Institute of Electrical and Electronics Engineers (IEEE): [www.uregina.ca/external/communications/feature-stories/current/2016/09-21.html](http://www.uregina.ca/external/communications/feature-stories/current/2016/09-21.html)

Schlumberger Reservoir Laboratories has donated a considerable amount of teaching and research equipment to our Petroleum Systems Engineering Program.

Engineers Without Borders at the University of Regina took the lead to make the campus fair trade: [leaderpost.com/business/students-at-university-of-regina-taking-steps-to-make-the-campus-fair-trade](http://leaderpost.com/business/students-at-university-of-regina-taking-steps-to-make-the-campus-fair-trade).

We are also proud of our alumni:

- **Ms. Leah Lawrence**, a 1994 graduate from industrial systems engineering, was named the winner of the Female Executive of the Year Award by the Stevie Awards for Women in Business.
- **Adam Serblowski**, electronic systems engineering, 2008, was a member of the team involved in the development of Shell's Frontline Sensabot Robot to monitor the Kazakh Site.
- **Kelly Scherr (nee Wyatt)**, regional environmental systems engineering, 1997, was appointed the top city engineer, London, ON.



# News Beyond Our Borders



telegraph.co.uk

## Female engineers not taken seriously

*The Engineer* - According to Professor Brian Rubineau of Desautels Faculty of Management at McGill University, female engineers are leaving an already male-dominated engineering field due to a culture that does not take them seriously.

Rubineau, along with co-authors Carroll Seron (UC Irvine), Erin Cech (University of Michigan) and Susan Silbey (MIT), found that unchallenging projects, blatant sexual harassment and greater isolation from support networks contribute to women leaving engineering.

Their longitudinal study followed 700 students from four schools during their four years of college and again five years after they graduated. The study examined students' diary entries and focused on interactions with other students in classes and projects, as well as college culture and future occupational and family expectations.

According to Rubineau, many of the women in the study experienced blatant gender bias in their project teams and internships with much of the hands-on aspects of engineering treated as 'men's work', with women relegated to more secretarial duties. This culture of sexism and stereotyping sidelines qualified women, who then often choose a different career path.

## Canadian scientists help prepare a path to Mars

CBC - If humans one day set foot on Mars, Canadians will have contributed to the science that helped make it possible. For example, NASA announced the discovery of an ice deposit as voluminous as Lake Superior. The lead author of the paper was Cassie Stuurman, a Canadian geophysicist currently with the University of Texas.

Gordon Osinski, a planetary geologist at Western University in London, Ont., was a co-author of the paper. Among other hats he wears, he's the acting director for the university's Centre for Planetary Science and Exploration. His research takes him to the Arctic where his findings are a guide to what we might expect to find on Mars.

Canada's most famous contribution to the space program is undoubtedly the Canadarm and robotics is something that we do extremely well.

"This has been the Canadian model: to contribute instruments to other lead missions," said Richard Léveillé, adjunct professor at McGill University's department of Earth and planetary sciences. Léveillé has done extensive research on Mars, with a focus on geology, and is currently working in partnership with the Canadian Space Agency and NASA analyzing the composition of Mars.

## Billions of litres of raw sewage pour into Canadian waterways

CBC - More than 205 billion litres of raw sewage and untreated waste water spewed into Canada's rivers and oceans last year despite federal regulations introduced in 2012 to try to solve the problem.

In fact, the amount of untreated waste water, which includes raw sewage and rain and snow runoff, that flowed into Canadian rivers and oceans last year would fill 82,255 Olympic-size swimming pools — an increase of 1.9 per cent over 2014.

The volume was supposed to drop as cities and towns move to comply with the standards the government adopted four years ago. But figures obtained from Environment Canada show that after a small improvement between 2013 and 2014, the amount of untreated waste water actually increased last year.

Elaine MacDonald, P.Eng., an environmental engineer with Ecojustice, said a lack of funding and the long timeline for compliance are contributing to the problem.

The federal government has committed \$2 billion in additional funds to assist municipalities with waste water upgrades. The Federation of Canadian Municipalities welcomes the funding but says it's a drop in the bucket compared with the \$18 billion it estimates it will take to comply with the federal standards.



Wired

### Self-driving truck hits the road

CTV - A self-driving truck will soon travel on two Ohio roads after state officials announce details of new investments to support innovative transportation technology.

A vehicle from self-driving truck maker Otto began travelling a 35-mile stretch of US Route 33 in late November in central Ohio near the Transportation Research Center, an independent testing facility. It will travel in regular traffic and a driver in the truck will be positioned to intervene should anything go awry, a Department of Transportation spokesman said, adding that "safety is obviously number one".

Officials say that section of Route 33 - a four-lane, divided road - is an important piece of autonomous vehicle research in the state and will become a corridor where new technologies can be safely tested in real-life traffic, aided by a fibre optic cable network and sensor systems slated for installation next year.

### New U of T certificate in forensic engineering

*The Canadian Press* - Doug Perovic loves his job, but he also wishes he didn't have to do it. If he's called upon, it usually means something catastrophic has occurred. The U of T engineering professor has been involved in hundreds of investigations, including fatal Toronto incidents such as the Sunrise Propane explosion in 2008 and the stage collapse at a Radiohead concert in 2014.

Despite working in the field for 25 years, Perovic says forensic engineering is still in its infancy. The professor will soon help grow the field by teaching a course as part of a new forensic engineering certificate program offered by U of T's Faculty of Applied Science and Engineering — one the university says is the first of its kind in Canada.

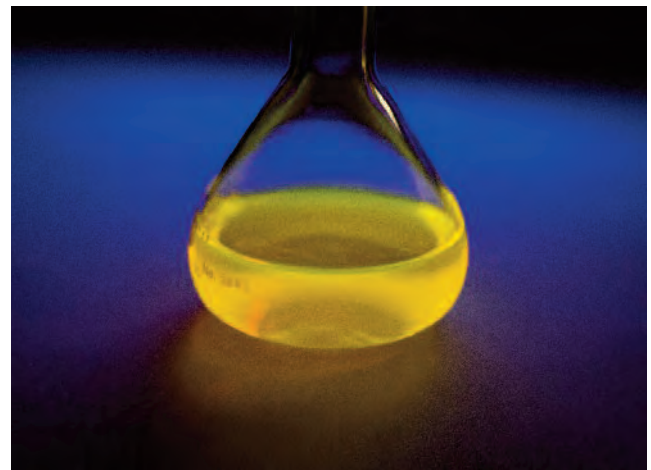
Perovic says he plans to start his first class in January with a disturbing image of a car crash, including the people beheaded as a result.

"If you want to do this stuff, you'll be looking at things like police photos," he says.

Forensic engineering, which was recently formalized as a practice by the Professional Engineers of Ontario, is "an important field," Perovic says.

"I want my students to learn that their duty as forensic engineers is not to whichever company hires you to investigate, but to the public to ensure we figure out what went wrong and make sure it doesn't happen again."

## TECH CORNER



www.buffalo.edu

### Glow-in-the-dark dye could power liquid batteries

*Electronics360* - Researchers at the University of Buffalo are looking into next-generation energy-storage batteries using the fluorescent dye boron-dipyrromethene (or BODIPY), a material that can be used to stockpile energy, making it suitable for rechargeable liquid-based batteries that could power home-energy storage or even automobiles of the future.

The BODIPY dye has unusual chemical properties that allow it to store electrons and participate in electron transfer—the functions needed to save and deliver energy. Tests on a liquid-based battery using BODIPY were shown to operate efficiently, running well after researchers drained and recharged the battery 100 times.

Fluid-filled power cells offer many advantages over those made from conventional materials, University of Buffalo researchers say. First, dye-based batteries would not have the problem of catching fire—unlike lithium-ion batteries. If they ruptured inside the battery, they would simply leak. Also a fluid-filled battery can store more energy than other batteries—enough to power a solar house overnight or to enable a utility company to stockpile wind energy.

## A new approach to conversion of CO<sub>2</sub>

*Electronics 360* - The increasing concentration of CO<sub>2</sub> in the atmosphere has proved a major challenge to humans and the environment. For many years, scientists have tried to develop methods to convert CO<sub>2</sub> into a useful and environmentally safe product such as biofuel. So far they have been unsuccessful in developing an efficient method for the conversion.

However, a team of scientists has reverse engineered a natural pathway (photosynthesis) for CO<sub>2</sub> fixation used by plants to convert CO<sub>2</sub> into carbohydrates (mainly sugar) and at the same time release oxygen to the atmosphere. The researchers are from the Max Planck Institute in Marburg, Germany, working in conjunction with scientists from the Lawrence Berkeley National Laboratory and the DNA synthesis expertise of the US Department of Energy Joint Genome Institute.

The team of researchers developed a new CO<sub>2</sub>-fixing enzyme that is 20 times faster than the enzymes found in nature to convert CO<sub>2</sub> into sugar using sunlight.



## “Diamond-age” nuclear batteries developed

*Phys.org* - New technology has been developed that uses nuclear waste to generate electricity in a nuclear-powered battery. A team of physicists and chemists from the University of Bristol have grown a man-made diamond that, when placed in a radioactive field, is able to generate a small electrical current. The development could solve some of the problems of nuclear waste, clean electricity generation and battery life.

Unlike the majority of electricity-generation technologies, which use energy to move a magnet through a coil of wire to generate a current, the man-made diamond is able to produce a charge simply by being placed in close proximity to a radioactive source.

Tom Scott, professor in materials in the university's Interface Analysis Centre and a member of the Cabot Institute, said: "There are no moving parts involved, no emissions generated and no maintenance required, just direct electricity generation. By encapsulating radioactive

material inside diamonds, we turn a long-term problem of nuclear waste into a nuclear-powered battery and a long-term supply of clean energy."

Although the power generated by these batteries is low, their potential lifetime could revolutionize the powering of devices over long time scales. It would take 5,730 years to reach 50 per cent power, which is about as long as human civilization has existed. They would be ideal in applications such as deep-space probes where replacing or recharging the battery would not be feasible.



## Virgin Galactic marks giant leap for space travel

*Electronics360* - Virgin Galactic's SpaceShip Two, VSS Unity, successfully completed its first free flight, an important step for the company that hopes to bring space flight to tourists. SpaceShip Two – a reusable, winged spacecraft designed to repeatedly carry as many as eight people (including two pilots) into space – spent 10 minutes of the recent one-hour and 20-minute flight in free flight on December 3, 2016. During this time the pilots, mission controllers and ground crew collected valuable data, according to a press release issued by Virgin Galactic.

SpaceShip Two, VSS Unity, is the first craft built by the spaceship company to achieve free flight. For this gliding test flight, SpaceShip Two performed as the company expected, completing a maximum speed of approximately Mach 0.6 while gliding home from an altitude of 50,000 feet.

Virgin Galactic engineers are taking time to analyze the test data and feedback from the pilots before preparing SpaceShip Two for its next flight.



**A P E G S**

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# what's ailing the self-employed?

How health and disability insurance can help

## The Self-Employment Challenge

Being your own boss has its perks. But without an employer's group benefits, self-employment also means fending for yourself in case of illness or disability.



Over two-thirds of surveyed self-employed individuals are concerned about their lack of access to medical coverage and insurance.<sup>1</sup>



8 in 10 Canadians are concerned about the government's ability to fund health care, the cost of longterm care, and having enough money if they become disabled or seriously ill.<sup>2</sup>

## The Role of Insurance

Supplementary health and disability income insurance plans help protect against financial loss due to illnesses or accidents.

### Why health insurance?

Canadian families are spending an increasing share of their household income on health care.<sup>3</sup>

Households in the 3 top income quintiles had an average:<sup>4</sup>

- 39% increase in dental spending
- 24% increase in prescription drug spending

### Why disability insurance?

• 1 in 3 people will be disabled for 90 days or more at least once before they reach age 65.<sup>5</sup>

• 49% of bankruptcies and mortgage foreclosures are due to disability.<sup>6</sup>

• A disability of over 90 days is likely to last three years or more for a 35-year-old man or woman, and four years or more for a 45-year-old man or woman.<sup>7</sup>

## Engineers Canada-Sponsored Insurance Plans

Exclusive to professional engineering, geoscience and technology association members and their families, at low rates not available to the general public.

Health & Dental Insurance covers both routine and unexpected medical expenses, such as:

- Prescription drugs
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- Eye exams and eyeglasses

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<sup>1</sup> Human Resources and Skills Development Canada: 2006 Survey of Self-Employed Individuals: Perceptions of Benefit Coverage, May 2006.

<sup>3</sup> Chaplin R, Earl L: Household spending on health care. Health Reports 2000; 12(1): 57-65.

<sup>5</sup> Canada Life and Health Insurance Association, A guide to disability insurance, November 2012.

<sup>7</sup> Disability Insurance: Where Will the Money Come From If You're Disabled? Canadian Life and Health Insurance Association, January 2004.

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<sup>2</sup> Canadians at Financial Risk: 2013 Canadian Life Insurance Ownership Study Highlights, LIMRA, 2013.

<sup>4</sup> Statistics Canada: Trends in out-of-pocket health care expenditures in Canada, by household income, 1997 to 2009 (April 2014).

<sup>6</sup> Get Sick, Get Out: The Medical Causes of Home Mortgage Foreclosures. Health Matrix: Journal of Law-Medicine, Vol. 18, No. 65, 2008.

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# Calendar Of Events



## **Green Associate Exam Kickstarter**

February 23, 2017  
Winnipeg, MB  
[bit.ly/2hgrU11](http://bit.ly/2hgrU11)

## **Introduction to Hydrogeology and Groundwater Management**

February 23, 2017  
Vancouver, BC  
[www.apeg.bc.ca/Events/Events/2017](http://www.apeg.bc.ca/Events/Events/2017)

## **International Conference on Water Management Modeling (ICWMM)**

March 1-2, 2017  
Brampton, Ontario  
[www.icwmm.org](http://www.icwmm.org)

## **APEGS Spring Professional Development Days**

March 2-3  
Saskatoon, SK  
[www.apegs.ca](http://www.apegs.ca)

## **Saskatchewan Engineering and Geoscience Week**

March 5-11, 2017  
Various locations  
[www.apegs.ca](http://www.apegs.ca)

## **Registration Deadline for Spring Professional Practice Exam and Law & Ethics Seminar**

March 17, 2017  
Online  
[www.apegs.ca](http://www.apegs.ca)

## **Saskatoon Engineering Society Undergraduate Engineering Student Design Showcase**

March 29, 2017  
Saskatoon, SK  
[www.saskatoonengineers.com](http://www.saskatoonengineers.com)

## **2017 CISC Steel Design Awards**

April 5, 2017  
Winnipeg, MB  
[www.cisc-icca.ca/awards/manitoba/2017](http://www.cisc-icca.ca/awards/manitoba/2017)

## **Law and Ethics Seminar**

April 21-22, 2017  
Saskatoon, SK  
[www.apegs.ca](http://www.apegs.ca)

## **Canadian Institute of Mining, Metallurgy and Petroleum (CIM) 2017 Convention**

April 30-May 3, 2017  
Montreal, QC  
[www.convention.cim.org](http://www.convention.cim.org)

## **APEGS Annual Meeting**

May 4-6, 2017  
Regina, SK  
[www.apegs.ca](http://www.apegs.ca)

## **WinSETT Leadership Workshop**

May 5, 2017  
Vancouver, BC  
[bit.ly/2hkcmVi](http://bit.ly/2hkcmVi)

## **Professional Practice Exam**

May 27, 2017  
Regina and Saskatoon  
[www.apegs.ca](http://www.apegs.ca)