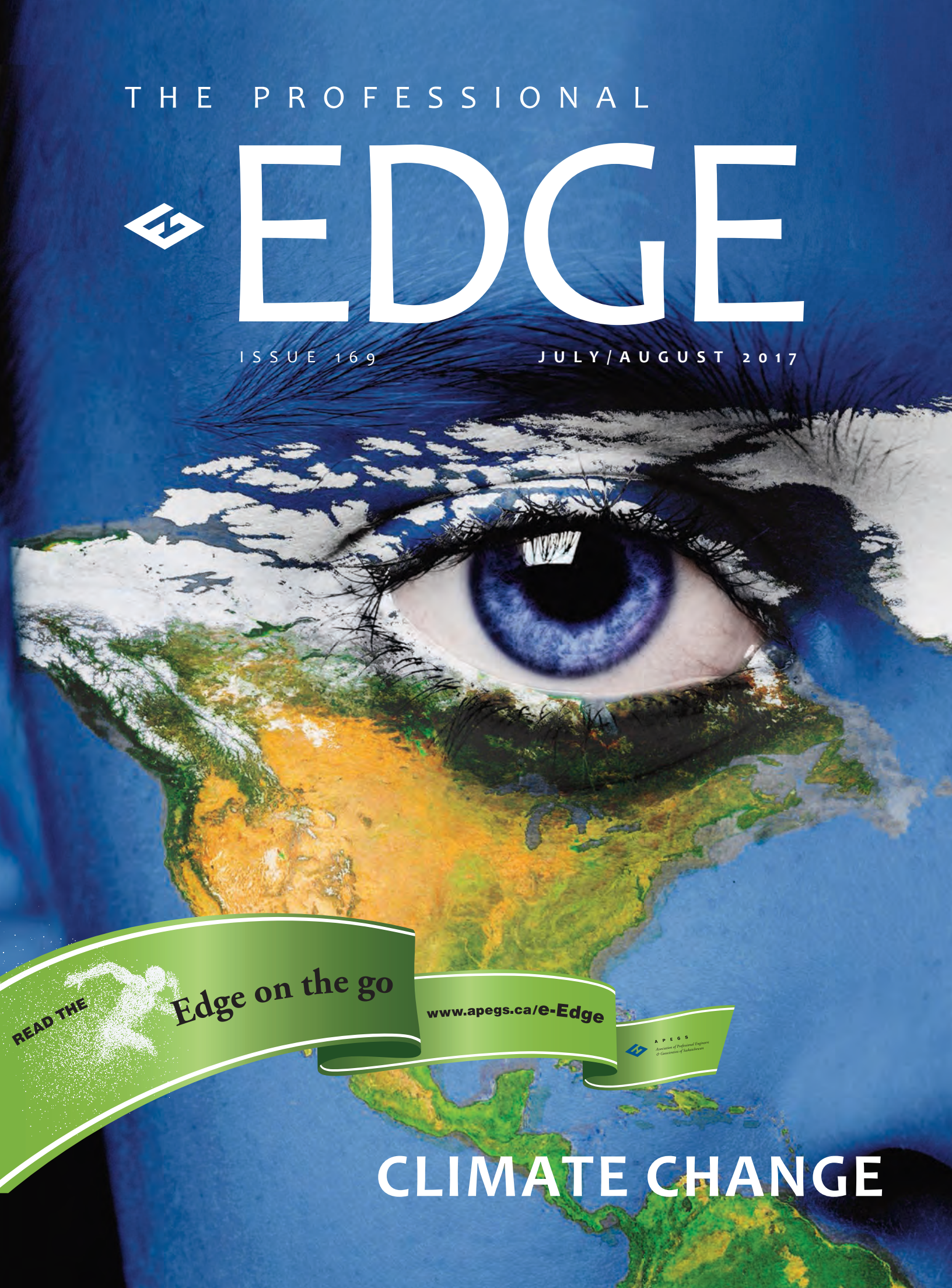
THE PROFESSIONAL
EDGE
ISSUE 169
JULY/AUGUST 2017
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Achieving a Safe and Prosperous Future through Engineering and Geoscience

Editorial provided by:

Martin Charlton Communications
#300 - 1914 Hamilton Street, Regina, Saskatchewan S4P 3N6
T: 306.584-1000, F: 306. 584-5111, E: marylynn@martincharlton.ca

Editor:

Lyle Hewitt, Managing Director, Martin Charlton Communications
E: lyle@martincharlton.ca

Design and Layout:

Jo Anne Lauder Publishing & Design, T: 306.522-8461, E :joanne.lauder@sasktel.net

Submissions to:

The Professional Edge Editorial Committee
300 - 4581 Parliament Avenue, Regina SK S4W 0G3
T: 306.525.9547 F: 306.525.0851 Toll Free: 800.500.9547
E: apegs@apegs.ca

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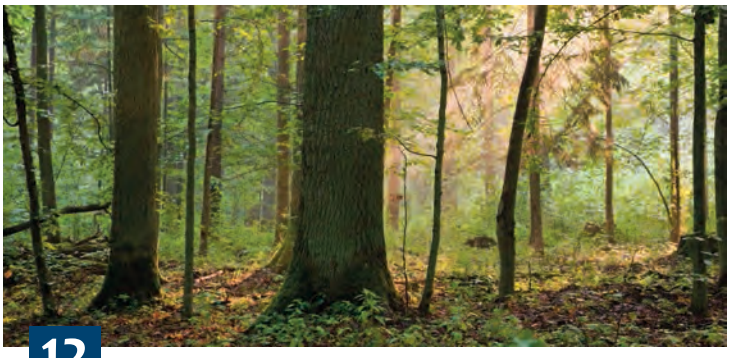
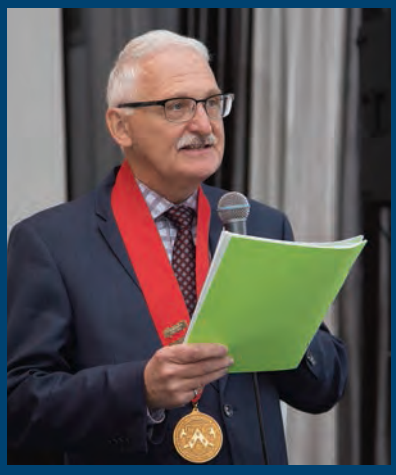


President's Message



Ernie Barber, P.Ag., P.Eng., APEGS President

At the global level, there are a handful of highly complex issues that concern each of us in one way or another. There are today a handful of highly complex global issues that are stubbornly resistant to solution. Think food, water and energy security; poverty, inequity and political instability; health care and infectious disease; environmental sustainability and climate change. While these are global problems, they most certainly have local contributions and consequences.

As early as 1973, the general theory of "wicked" problems was proposed as a way to describe a particular class of generally intractable social and cultural issues (Rittel, H. W., & Webber, M. M., "Dilemmas in a general theory of planning," *Policy Sciences*, 4(2), 155-169. 1973). Wicked problems are those that are impossible or nearly impossible to resolve. The problems themselves defy precise definition and any solutions are without precedent. The problems run one into another, one a symptom of the other. Situations can be improved but never really solved. Proposed solutions cannot be proven right or wrong and there is no idealized and generally accepted end state.

Professional engineers and geoscientists - around the world and here at home in Saskatchewan and Canada - have critically necessary roles and responsibility to propose, critique, design and implement approaches to mitigating the negative impacts of wicked problems. In this issue of the *Edge*, you will be provoked to reflect on what you know and what you don't know about climate change and to take action as appropriate in your work as a professional and in your life as a citizen.

In the last issue of the Edge, I summarized three areas of focus for APEGS and it is not difficult to link these priorities to our responsibilities relative to climate change and sustainability.

We can make it a priority to include climate change and adaptation within our plans and reporting for professional development. One feature of all wicked problems is their constantly changing nature and it is easy to get left behind in our own understanding and knowledge.

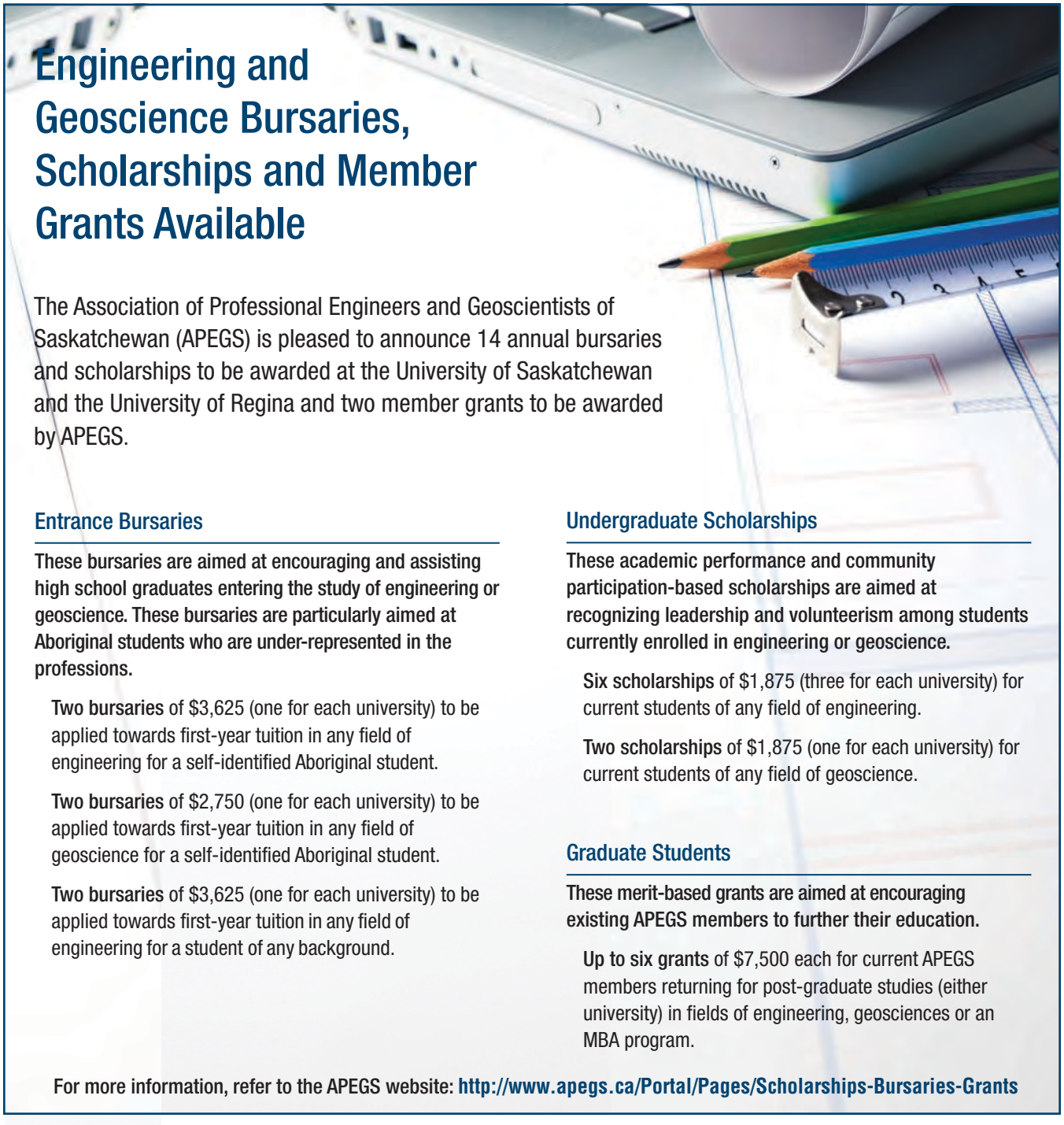
We can seek understanding and action in the spaces between disciplines, professions and cultures. Climate change and society's responses to it are very multi-disciplinary. In Saskatchewan, we have a huge opportunity and responsibility to hear the different ways of knowing about climate and sustainability among indigenous and non-indigenous people and new immigrants. Women's voices and men's voices on climate change are each important as we seek to design a better world for everyone.

We can ensure that the public and other professions know what geoscientists and engineers bring to the table. Perhaps now more than ever there is a need for scientists – for engineers and geoscientists – to be engaged with policy-makers, to ensure that our knowledge and experiences are explicitly included in the debate and in the decisions. Public safety and well-being are enhanced when we help governments, policy-makers, clients and communities recognize impending climate change - patterns and consequences of change - and develop science-based approaches to mitigation and adaptation.

CORRECTION

Issue 168, May/June 2017, of *The Professional Edge* included a summary article by Martin Charlton Communications titled "The Science of War: Engineers and Geoscientists at Vimy Ridge", pgs. 10-12. The editorial staff failed to note that the summary article was derived from the May 5, 2017 presentation of Prof. Don Gendzwill, P.Eng., P.Geo., the researcher and author of the track session titled " Vimy Ridge: The Role of Science in a Canadian Victory" at the APEGS 87th Annual Meeting & Professional Development Conference in Regina. A photo of Prof. Gendzwill presenting his paper appeared on the cover of issue 168 but no caption for the photo appeared in the magazine.

The editorial staff of *The Professional Edge* would like to apologize to Prof. Gendzwill and to the readership of *The Professional Edge* for these significant lapses in our normal journalistic standards. Appropriate instructional and disciplinary measures have been taken with the editorial staff members involved.



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 two 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.

Up to six grants of $7,500 each for current APEGS members returning for post-graduate studies (either university) in fields of engineering, geosciences or an MBA program.

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

Climate Change Mitigation

SUBMITTED BY THE APEGS ENVIRONMENT AND SUSTAINABILITY COMMITTEE

Opinions expressed do not necessarily reflect the views or policies of APEGS.

Climate change is a topic that has stirred a great deal of controversy in recent years. It has been the subject of everything from domestic political debates, international treaties and even arguments at the neighbourhood pub.

Scientists and engineers who have been studying air quality and climate have come to a conclusion about climate change: It's real and man-made.

There is much rhetoric that surrounds this topic so it is useful to step back and review some of the evidence.

Growth in greenhouse gases

The earth's atmosphere and climate have changed radically over geologic time. An ice core recovered from Lake Vostok, Antarctica, and other climate proxy data show that atmospheric CO_2 has varied between 180 and 280 parts per million (ppm) over the past 420,000 years. Currently it is above 400 ppm and increasing at 1 to 2 ppm per year.

Increases in global air temperature in response to increases in atmospheric CO_2 was first predicted by Nobel Laureate Svante Arrhenius in 1895.

The evidence does show warming, and it appears to be man-made, caused by unsustainable rates of fossil fuel consumption *(see Figure 1)*.

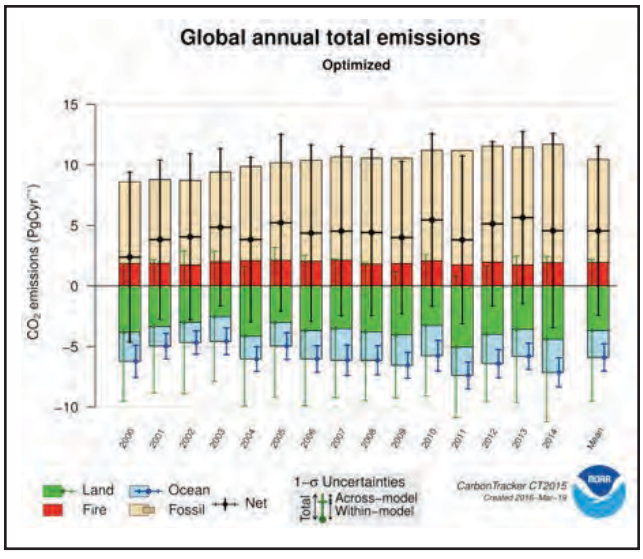


FIGURE 1

Emissions Allocation: We All Have To Do Our Part

Although the evidence of climate change is daunting, the situation is far from hopeless. Engineers and geoscientists have a role to play in solving the problem.

Climate projections span a range of greenhouse gas (GHG) emissions scenarios based on assumptions about population growth, economic activity, energy intensity and socio-economic development.

The predictions show the worst effects of climate change could be avoided if atmospheric CO2 concentrations are kept below 530 ppm. This implies global emissions should be kept stable at the current 50 gigatonnes per year (Gt/yr) until 2030, dropping to 30 Gt/yr by 2050.

It's hard to envision what that means with numbers on that scale so let's break it down to the personal level. To reach this goal, each person's CO2 "allowance" would have to come down to 6.8 tonnes per year (t/yr).

The average Canadian emits

21 t/yr.

Here in Saskatchewan we each emit

67 t/yr.

The average Canadian emits 21 t/yr. Here in Saskatchewan we each emit 67 t/yr.

It's unlikely that in Saskatchewan we will reach the 6.8 t/person/year goal any time soon. In fact, we may never reach it. But we have to be aware that, if we're not reaching that goal, there are others in the world who will have to make do with an even lower target to compensate. We need to do whatever we can to improve.

Mitigation Opportunities In Saskatchewan

To figure out how to fix Saskatchewan's GHG emissions problem, we first need to measure it.

In 2013, Saskatchewan emitted 74.8 million tonnes of CO2 equivalents (74.8 Mt CO2e).

How did we rack up such a big CO2 "tab"?

The single biggest culprit is general energy use coming in at 59.5 Mt CO2e followed by agricultural emissions (13.0 Mt CO2e).

General energy use includes emissions from transport (16.6 Mt CO2e), public electricity and heat production (16.0 Mt CO2e) and fugitive emissions (e.g., flare gas) from oil and gas production (13.0 Mt CO2e), with other sectors registering lower amounts.

And if you drill down, there are some interesting surprises. Emissions from on-road transportation (7.8 Mt CO2e) are just about the same as the total emissions for mining and upstream oil and gas production (7.8 Mt CO2e). Commercial and institutional emissions (1.2 Mt CO2e) and residential emissions (1.9 Mt CO2e) are actually higher than those from our petroleum refineries (1.1 Mt CO2e).

=

For more information, check out the enhanced version of this article on the e-Edge at **www.apegs.ca/e-Edge/**

This breakdown isn't to place blame but to look for opportunities for improvement.

Transportation:

Except for increasing biofuel use, there are few opportunities for Saskatchewan residents to reduce on- and off-road emissions until electric vehicles are affordable and broadly available. Designing and planning transport with fuel economy as an objective is something that can be done today.

Agriculture:

Agricultural emissions are from soils and from livestock and their manure. Mitigation options may be limited to reducing food waste and meat consumption.

Resource Sector:

Many mines and upstream oil and gas industries are already employing best available energy technologies because they are working to improve their bottom line. In the face of historically low commodity prices, resource companies have more motivation than ever to reduce production costs. But these heavy industries are nonetheless some of the largest electricity consumers, so further efficiencies may yet be found.

Fugitive Gases:

One of the best opportunities to reduce Saskatchewan's carbon profile is to deal with fugitive methane emissions from oil and gas production - the constant, small leaks of natural gas that escape from pipelines, valves and other equipment. Alberta and Saskatchewan are moving aggressively with policies intended to reduce fugitive methane emissions by 50 per cent. Implementing these reductions could reduce provincial emissions by nine per cent or about six t/person.

Decarbonizing the Grid:

It's no secret that Saskatchewan's electrical grid is the most fossil-fuel reliant of any in Canada (650 t CO_2e/GWh). Some improvements can be achieved through reduced electrical demand and there have been many initiatives to this end. But the challenge of reducing the carbon intensity of our grid remains. If we could cut the carbon intensity of our grid in half, it would reduce provincial emissions by 11 per cent or by about 13 t/person.

Wind and solar photovoltaic power systems have minimal carbon profiles (11 t CO_2e/GWh and 44 t CO_2e/GWh respectively) and their costs continue to drop. But their low capacity factors will require backup sources. Natural gas seems attractive, but its carbon intensity (477 t CO_2e/GWh) is too high to achieve long-term emissions targets.

Carbon capture utilization and storage (CCUS) is being pioneered in Saskatchewan and lowers emissions intensity for coal from about 1000 to 120 t CO_2/GWh. But it's also an expensive solution that may make it unattractive compared to other low-carbon sources, such as nuclear (10 – 20 t CO_2e/GWh) and large-scale hydro (5 – 10 t CO_2e/GWh).

The Challenge

The enormity of the engineering challenges required to mitigate climate change is often underestimated. As APEGS members, we hold the knowledge and skills to rise to this challenge for the benefit of Saskatchewan and the world.

Climate Change Adaptation

SUBMITTED BY THE APEGS ENVIRONMENT AND SUSTAINABILITY COMMITTEE

Opinions expressed do not necessarily reflect the views or policies of APEGS.

A great deal of the work of engineers and geoscientists involves "what ifs." What if a building is hit by a hurricane or an earth tremor? What if there is an unusually high flood? It is the job of the professions to keep the public safe even in extreme scenarios.

Some of the scenarios we face today are those posed by climate change. While there remains some public debate and while there will always be some skeptics, the degree of consensus surrounding climate change is more than high enough that engineers and geoscientists must take it seriously as part of their project planning.

Much of the discussion surrounding climate change focuses on mitigations i.e. how to reduce CO_2 emissions to minimize the effects of climate change. But another part of the discussion is climate change adaptation. What can engineers and geoscientists do to protect the public from the effects of climate change?

Some of the predicted consequences of climate change may be global and negative such as coastal inundation, ocean acidification and loss of biodiversity. Others at the regional scale may be positive, such as warmer weather in cold climates, increased growing days for crops and more precipitation in the Northern Great Plains.

Failure to predict and plan for regional climate change could negatively affect social and economic systems, regardless of whether the local effects of climate change are negative or positive. APEGS professionals will be called upon to assess risks related to climate change, and to mitigate them via adaptation. A more resilient society is a more sustainable society.

What may be In store for Saskatchewan

Future climate projections make use of a variety of modelling tools to anticipate the effects, environmental and socio-economic effects, of various levels of emissions.

In Saskatchewan, low emissions scenarios predict an increase in mean temperature of 1.6°C in the winter and 1.0°C in the summer by 2050. Predicted temperature increases under a high emissions scenario are up to 5.5°C in the winter and 4.0°C in the summer.

The low emissions scenarios predict an increase in precipitation of 2.1 per cent in the winter and a decrease of 2.4 per cent in the summer by 2050. Under a high emissions scenario predicted precipitation changes range up to an increase of 18.7 per cent in the winter and a decrease of 4.8 per cent in the summer.

But these incremental changes are only part of the story. For many climate change effects, changes in the frequency and magnitude of extreme events are more important than changes in mean values. For example, under a high emissions scenario, an annual maximum daily temperature that would currently be attained once every 10 years on average could become an annual event by the end of the century.

Similarly, extreme weather events are now generating catastrophic losses in Canada well beyond historical norms. Loss claims in Canada grew for the 25-year period from 1983-2008, from a typical range of $200-$500 million annually to more than $1 billion per year for every year from 2009 onward.

Adapting by assessing and mitigating climate risks

In response to the need to assess and mitigate climate-related risk, Engineers Canada has developed the Public Infrastructure Engineering Vulnerability Committee Protocol (PIEVC). PIEVC has already been applied to risk assessments for water and wastewater systems, buildings, electricity distribution, roads, bridges and airports.

The protocol systematically reviews historical climate information and projects the nature, severity and probability of future climate changes and events. It also establishes the adaptive capacity of infrastructure assets as determined by their design, operation and maintenance.

PIEVC includes an estimate of the severity of climate effects on the components of the infrastructure (i.e. deterioration, damage or destruction) to enable the identification of higher risk components and the nature of the threats from climate change impacts. This information can be used to make informed engineering decisions on what components require adaptation as well as how to adapt them (e.g. design adjustments, changes to operational or maintenance procedures).

Consequences of failing to adapt

Perhaps more than ever, engineers and geoscientists must consider the future liabilities of their decisions and professional endeavours of today. Legislation and regulation around climate adaptation have not yet been enacted yet as statute law. Hence legal direction for dealing with climate change liability issues is being led by common law in North America. As professionals, we need to take steps beyond current regulation and policies and, as a professional body, we should be aware that codes and standards may be inadequate to deal with future events.

This means, for example, that a Saskatchewan municipality could see litigation if an extreme climate event occurs, even when current codes and standards are adhered to for the construction of infrastructure that was built to standards "at that time". If the court deems a breach of duty or standard of care, they could find negligence on behalf of the professionals involved. Class action lawsuits could result, with significant impacts to local economies.

This is not a call for panic, but rather a time to prepare and develop awareness. We should learn how to adapt to the new demands being placed upon our profession.

Engineers Canada is committed to raising awareness about the potential effects of climate change as it relates to professional practice. They have recently published a National Guideline to assist this effort titled *Principles of Climate Change Adaptation for Engineers.* The APEGS Environment and Sustainability Committee encourages engineers and geoscientists to keep themselves informed about the changing climate and consider potential impacts on their professional activities.

For more information, check out the enhanced version of this article on the e-Edge at **www.apegs.ca/e-Edge/**

Welcome to the Greenest Province

SUBMITTED BY MILES HAUKENESS P.ENG. (REPRINTED FROM THE *ESTEVAN MERCURY*)

Opinions expressed do not necessarily reflect the views or policies of APEGS.

It is a paradox that far from being a major contributor to global climate change, Saskatchewan actually produces less greenhouse gas (GHG) now than at any time in its history.

Our province's GHG emissions were 75 million tonnes in 2013, according to Environment Canada. GHG emissions are primarily carbon dioxide (CO_2) and minor amounts of methane (CH_4) and nitrous oxide (N_2O).

The proposed federal carbon tax initiative will hit us especially hard as Alberta and Saskatchewan are considered the largest per capita GHG emitters in Canada and near the top emitters in the world.

What has been overlooked is the reality that the fixed carbon and associated carbon dioxide sequestered in agri-food (grains, oilseeds, etc.) that Saskatchewan exports every year have not been factored into the calculated provincial GHG assessment.

The atmospheric CO_2 used by agri-food is fixed as carbon in the food and provides most of the biomass weight (average 45 per cent). The 28 million tonnes of agri-food Saskatchewan exports annually contain 13 million tonnes of carbon ... all taken from the Saskatchewan atmosphere. The carbon atom in agri-food is converted from 48 million tonnes of CO_2 that is absorbed from the atmosphere and used by the crops to produce stalk, grain and roots.

Saskatchewan exports of agri-food per year are equivalent to providing all the food energy for about 60 million people. With a population of just over one million, Saskatchewan imports only a small percentage of agri-food (fruits, vegetables) compared with the tonnage that is exported.

This impact has been largely ignored by the scientists and policy-makers since any plant/food that absorbs CO_2 is eventually re-released as CO_2 when consumed, for a net zero emission. Most of the carbon in harvested crops

eventually ends up as sewage or living tissue that decomposes into CO_2 with the remainder released as CO_2 by respiration. However, as the new carbon tax will be based on provincial contributions to greenhouse gas, the tax should take into account that by far the majority of agri-food produced in Saskatchewan is consumed outside the province.

The current GHG assessment for Saskatchewan should be reduced from 75 million tonnes to the actual Saskatchewan net GHG emissions of 27 million tonnes CO_2 equivalent. The 70 per cent reduction is the equivalent CO_2 sequestered into exports, the carbon in exported agri-food shipped in railcars to places outside Saskatchewan where it is ultimately consumed.

Instead of penalizing Saskatchewan, the fixed carbon in agri-food and the eventual CO_2 released should apply to consumers who actually release the stored energy and carbon dioxide during digestion.

Currently when someone outside Saskatchewan eats Saskatchewan-supplied food, there is zero accounting for carbon to produce and transport the agri-food to the consumer. The energy in food that Saskatchewan derived from the atmosphere should be reported as emissions by the province or country where it is consumed. The same analogy is currently applied to exported petroleum where the countries that consume petroleum products report the corresponding CO_2 emissions.

In summary, if we put an imaginary box around Saskatchewan and perform a mass balance, the total amount of atmospheric carbon dioxide leaving this box is not 75 million tonnes annually, but 27 million tonnes with 13 million tonnes of carbon fixed in agri-food (taken from 48 million tonnes of atmospheric CO_2) leaving by railcars. The vast agricultural resources of Saskatchewan are the primary asset of this province and through efficient agri-food production, it actually reduces worldwide CO_2 emissions.

Additionally, if we look back before humans were here, the CO_2 emissions from Saskatchewan's imaginary box would be about 45 million tonnes annually, primarily from the natural life cycle of carbon and photosynthesis with most of the carbon fixed in the grasslands, forests and wildlife through decomposition eventually returning to the atmosphere within Saskatchewan. The world did not warm significantly as all the excess land-produced carbon dioxide was consumed by the algae in oceans and that eventually ends up as calcium carbonate deposited on the ocean floor where it turns into sedimentary rock.

Saskatchewan farmers and everyone helping them (SaskPower, oil and gas companies and all the infrastructure and service businesses) are currently contributing significantly to the reduction of global greenhouse gas emissions.

Congratulations to Saskatchewan for reducing CO_2 emissions from 45 million tonnes produced annually for the previous million years to our current annual emissions of 28 million tonnes per year.

Saskatchewan could actually double its coal-fired electricity plant capacity and still produce less CO_2 annually than the province did in prehistoric times.

If would be ridiculous for Saskatchewan to have to close its coal-fired power plants by 2030 or pay any carbon tax.

Welcome to the greenest province.

For more information, check out the enhanced version of this article on the e-Edge at **www.apegs.ca/e-Edge/**

Member Profile

This month *The Professional Edge* chats with retired engineering professor Marie Iwaniw, P.Eng.

Tell us about your personal and professional background.

I was born in Sudbury, Ontario and went to school there. After that, I attended Queen's University in Kingston where I got my bachelor's degree in engineering physics. I went on to get my master's and doctorate, also at Queens.

Why did you choose to go into engineering?

I was in high school in the 1960s during the height of the space program which really seized my interest. I had always been interested in math and sciences. I attended an all-girls separate school and, at the time, Ontario offered grade 13 but the school I attended couldn't afford to offer all the grade 13 sciences. Physics was offered at the boys' school and biology at the girls'. Because of my interest in space, I ended up taking classes at the boys' school. One day a recruiter came by from Queen's who made a pitch about the interesting work and job prospects in engineering and engineering physics. Likely if he had come to the girls' school he wouldn't have made the same pitch. But I was there that day and it sounded interesting so I ended up enrolling.

What was your biggest challenge in college?

People always assume that I faced a lot of challenges as a woman in those days. Maybe I was naïve but I can't say that I really encountered that. Even during my time in university, there was steady progress in the role of women in the field. When I started, there were 400 engineering physics students, two of whom were women. By the time I graduated, 280 students convocated and 12 were women.

My main challenges were academic. I discovered that electromagnetic theory and I didn't get along so I found myself instead studying mechanical engineering with a focus on thermo- and fluids dynamics.

What was your first job after college?

I worked at the University of Guelph where I taught agricultural engineering. I know that may seem odd because that wasn't the focus of my studies but the basics of fluid dynamics and thermodynamics are basic to all engineering programs in one way or another.

How did you come to teach in Regina?

I had been at Guelph for four years and was looking for something new. My sister and her husband had moved to Regina some time ago. She told me about an ad in the paper for a position at the U of R. I was particularly interested in the co-op work-study program so I applied, got the job and came here in 1988. The rest is history.

How many students have you taught over that time?

I would say I've dealt with over 2,000 students in one way or another either in class or in the Faculty of Engineering Co-op Work-study program, of which I was the director for many years. Maybe closer to 2,500.

In your view, how have things changed for women in the profession over that time?

One thing that hasn't changed is that people keep asking

about it, which shows people still think it's a problem. The female students I've taught have by and large been smart, strong women who can handle themselves in any situation.Perhaps the biggest thing that's changed, oddly enough, is that the expectations are lower. When I was a student, there was the feeling that, to be a female engineering student, you had to be better than your male peers. You had to be a straight A student to "prove" you belonged there. I think that's gone now. Female students can just be regular, average students with normal expectations, which is a sign that they've been accepted in the group.

What do you feel was your single greatest accomplishment as an Engineer?

My students. As an academic, I'm not like other engineers who can point to a building or a bridge as something they've accomplished. My "product," if you will, are my students and I'm proud to see the success that so many of them have achieved. I hope that I've given them not only the science and way of thinking but also, by example, shows them the values – the judgment, ethics and responsibility for one's actions that comes with being an engineer.

What are your interests outside of work?

You're assuming I've had an "outside of work"! I didn't have much time for myself when I was working. In retirement, I'm catching up on things – spending time with family, supervising household renovations, looking after my cats. My retirement is recent enough that it's still a bit like a holiday for me.

Have you ever met anyone famous?

I shook Chris Hadfield's hand. I had always wanted to be an astronaut but wasn't physically built for that. Fortunately that dream was forgotten so long ago that meeting Chris didn't inspire any regret.

What books are you reading at the moment?

Right now I'm reading *Game of Thrones*.

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

For my life in general, I'd say my parents. They came here from Ukraine after the Second World War as what were then called displaced people. They had very little education themselves so they instilled in my sisters and me the importance of education.

They also imparted to us a great attitude to life. They had not only survived the war but had also survived Stalin's oppression. They had this wonderful quiet attitude of just accepting troubles as they come, carrying on and getting through them.

As for my career, I had many inspiring professors and collagues. I wouldn't want to single them out but the ones I remember were ones who showed patience and understanding towards their students. These profs made me think, "I wish I could be like that" and I tried to emulate them through my career.

When I go out shopping or out and about I encounter my students all the time and they all seem to be doing extremely well.

I'm a warden in the Kipling camp for iron ring which keeps me in contact with the students.

STUDENT SPOTLIGHT

"First and Best" Student Sets Sights on Engineering

The fields of engineering and geoscience attract some of the planet's smartest people but it's not often it can be said, with authority, that a prospective engineer ranks among the first and best.

Jay Shah, son of APEGS member Rajesh Shah, P.Eng., is this year's recipient of the George and Marsha Ivany First and Best Scholarship.

The $40,000 scholarship has high standards, requiring a minimum average of 95 per cent simply to apply and an extensive background in school clubs community involvement, extracurricular activity leadership roles and athletic achievement to progress to serious consideration.

Jay met the exacting standards through involvement in Air Cadets, badminton, volleyball, "robot rumble," math club, student representative council, traditional Hindu music and his school's Change It charitable fundraising club. He is also a budding entrepreneur who has started his own custom clothing business.

With all the options available to him, Jay is planning a future in engineering, a choice he attributes to the many options available to engineers as well as its positive impact on the world.

"If you look around at the world, where there is disease and sickness, doctors thrive. Where crime is bad, lawyers thrive. But engineers thrive when times are good and they thrive on making people's lives better," Jay says.

NOTES FROM APEGS COUNCIL

The APEGS Council met Thursday, June 15, 2017 at the Temple Gardens Mineral Spa in Moose Jaw. 17 of 19 Councillors were present. Mike Griffin, APEGS legal counsel, attended as a guest. Council will meet next on October 12 and 13, 2017 in Saskatoon. The October 12, 2017 Council Meeting will include a meeting with the APEGS Past Presidents.

Council received the following presentations and information items:

- Mike Griffin presented on fiduciary duty and conflicts of interest.
- The Executive Director and Registrar presented on an Introduction to Self-Regulation.
- Activity updates were provided from the constituent society liaisons, the ACEC-SK liaison, the Sponsorship Task Group liaison, and the APEGS Directors to Engineers Canada and Geoscientists Canada.
- The APEGS Director of Registration provided an update on the Online Competency-Based Assessment Pilot and the status of the member database upgrade project. Gillian Pichler, P.Eng., Director, Registration for the Association of Professional Engineers and Geoscientists of British Columbia presented a demonstration via WebEx of their Online Competency-Based Assessment tool now in use.

Council passed motions as follows:

- Appointing Amanda Kostiuk, Engineer-in-Training to the 30 by 30 Task Group to represent the APEGS Equity and Diversity Committee.
- Life Membership was approved for the following members:

  Jackson, Graham G., P.Eng.

  Li, Patrick T-Y, P.Eng.

  Redekop, Robert P., P.Eng.

  Wilde, Richard L., P.Eng.
- Appointing Dwaine Entner as the public representative to the Investigation Committee.

Council noted and received the following reports:

Registrar's reports

The report on compliance activities for March and April 2017.

The Continuing Professional Development reporting statistics for 2016 and other activities to date including the results of the survey of attendees at the Continuing Professional Development plenary of Friday, May 5, 2017.

The unaudited financial statements for March and April 2017.

Executive Committee minutes, 30 by 30 Task Group minutes, Board minutes, and reports from the committees.

Committee member appointments: Khan Wahid, Ph.D., P.Eng. to the Academic Review Committee; Elen Li, P.Eng. to the Professional Practice Exam Committee; Marvin Loewen, Engineering Licensee to the Licensee Admissions Committee.

APEGS Value Proposition (AVP)

On June 16, 2017, also at the Temple Gardens Mineral Spa in Moose Jaw, Council, APEGS staff, and committee representatives conducted a full day of APEGS Value Proposition (AVP) planning. The planning session was facilitated by T. Bakkeli Consultants Inc.

APEGS Fall 2017

Professional Development Days

Conexus Arts Centre, Regina - October 16 & 17, 2017

Monday, October 16, 2017

8:00 – 8:30 **REGISTRATION**

TRACK ONE

8:30-10:00

Full STEAM Ahead!

(Presented by the 30 by 30 Task Group)

As Rare as Pandas: Fostering Change that Results in Small Wins and Big Gains

Women in leadership are as rare as pandas. In Canada, men are still two to three times more likely than women to hold a senior management position. This keynote will discuss how change is a necessary and complex, yet achievable endeavour that involves directing energies to our education systems, homes and organizations.

Gina Grandy is professor of strategy and leadership, RBC Women in Leadership Scholar, and Acting Associate dean of graduate programs and research with the Hill-Levene Schools of Business at the University of Regina.

Gina has designed and delivered a Women in Leadership course for the graduate programs in business at UofR and is active in numerous professional activities related to women and women in leadership locally and internationally.

TRACK TWO

Business Ethics

(UofR – Continuing Education)

The workshop will include presentations and discussions on:

- Defining and understanding ethics;
- Understanding the benefits of ethics;
- Creating strategies to implement ethics at work;
- Recognizing social and business responsibilities;
- Identifying ethical and unethical behaviour; and
- Learning how to make ethical decisions and lead with integrity.

Shelley Vendramin has been a federal public servant for over 20 years. During this time, she has worked in various roles. Shelley started in a clerical role and has worked her way up to a senior position in human resources. She has a bachelor degree in public administration and a master's degree in human resource management.

10:00-10:15 **COFFEE BREAK**

TRACK ONE

10:15–12:00

Why there is Value when Women Lean In?"

Studies have shown that women at the executive and board level of companies and organizations contribute positively to the bottom line. The diversity of ideas that women bring to the table motivates veteran team members to re-examine their assumptions and process data more carefully. In this session, 30 by 30 has invited Dr. Ernie Barber, P.Eng., P.Ag., President of APEGS, along with a panel of leaders and decision makers to discuss why they have promoted women into the higher ranks of their organization and, in their experience, what benefits they have seen as a result of those decisions. The panel will use a Q&A format, including questions from our audience!

Moderated by Gina Grandy.

TRACK TWO

Business Ethics

(continued)

12:00-1:00

Luncheon Speaker: Saskatchewan Geology

Musings about the geography and geology of Saskatchewan: Out from underneath the ice, a U2 spy plane, diamond-bearing volcanic eruptions and dodging meteorites while unlocking the province's vast mineral and oil potential.

Gary Delaney, Ph.D., P. Geo., is chief geologist, Saskatchewan Geological Survey (SGS), Saskatchewan Ministry of the Economy.

TRACK ONE

TRACK TWO

1:15-2:45

Empowering Women in their Professional Lives

Join APEGS in welcoming back Dr. Menzer Pehlivan, Ph.D, P.E., M.ASCE who will join us this fall for a session on attracting and retaining women in the engineering and geoscience professions. Menzer is a featured Engineer in the Imax Film *Dream Big: Engineering Our World*, and will share her stories of what led her to pursue engineering and why it is important for women to practise engineering in society.

Menzer Pehlivan, Ph.D., P.E., M.ASCE is a geotechnical engineer with a focus on earthquake engineering. She obtained her doctorate from The University of Texas at Austin in 2013.

In 2016 Dr. Pehlivan was selected as one of the New Faces of Engineering by American Society of Civil Engineers (ASCE). Dr. Pehlivan chairs ASCE Geo-Institute's Board-Level Outreach and Engagement Committee. She also serves as Geo-Institute representative in ASCE Diversity and Inclusion and Institute Advisory Committees.

Mentoring the Millennial Generation

(Bluegem Learning)

A workshop for supervisors, managers and project leaders aimed at increasing participant awareness of the subject of mentoring millennial employees in the workplace.

Russell Stratton, MA, MCIPD, MCMI is a certified trainer, leadership coach and writer with a master's degree in human resource management. Mr. Stratton has a proven track record of success around the world and has assisted individuals in a wide range of organizational cultures, including small- to medium-sized enterprises, law enforcement agencies, national government departments, charities and not-for-profits. He has worked with all levels of professionals from front-line staff to executive management boards.

2:45 – 3:00 **COFFEE BREAK**

3:00 – 4:30

Empowering Women in their Professional Lives

(continued)

Mentoring the Millennial Generation

(continued)

Tuesday, October 17, 2017

7:15 – 8:00

Succeeding in STEAM

(Presented by the 30 by 30 Task Group)

Women's History Month Event- Breakfast and Keynote Speaker

Registration

8:00-8:30 **BREAKFAST** **REGISTRATION**

TRACK ONE

TRACK TWO

8:30 – 8:45

Women's History Month Keynote – Picking up STEAM: Why Diverse Organizations Win

It's been well documented that teams with different backgrounds, ethnicities and gender do a better job of solving problems and strategically advancing their organizations. But diversity, especially in STEAM, means that recruiting, retaining and promoting diverse talent is challenging. Let's talk about why diversity matters and how you can foster an environment where diversity is celebrated and leveraged as a tool to help your organization succeed!

Brianna Brownell is founder and CEO of Pure Strategy Inc., a technology company that helps organizations make use of large volumes of data about their customers and market by creating an artificial intelligence engine to perform data analysis tasks normally done by human analysts.

Emotional Intelligence – Expanding Influence

(Achieve Learning Centres)

Emotionally intelligent people are able to identify and assess their emotions and those of others and then use that information to guide their actions and influence the actions of others. Participants in this workshop will learn to utilize emotional intelligence more effectively through self-assessment and skill development exercises, resulting in an increased ability to engage with others and expand their influence.

Janelle Jackiw has master's degrees in criminology and educational psychology. Her broad range of experience includes working in front-line and leadership roles in both government and social service organizations.

TRACK ONE

9:15 – 10:00

Picking Up STEAM: Essential Skills for Leadership in a Diverse Organization

Often the narrative around diversity initiatives is negative - there aren't "enough" women in STEAM roles, there is a leaky pipeline or a glass ceiling. But let's turn that thinking on its head and look at how being a champion of diversity can make you a crucial, positive voice within your organization and help you succeed in your career by pushing your organization forward in a meaningful way.

We will discuss diversity and inclusion in a general sense, but focus on how to encourage gender parity in STEAM to support APEGS's 30 by 30 initiative.

Brianna Brownell – see above.

Trevor Maber is the director of strategy with Pure Strategy Inc., and is an award-winning faculty member at the Edwards School of Business (University of Saskatchewan), having taught across the areas of leadership, human resources, training & organizational development, international business, presentation skills and case analysis. Previously the director of people strategies with Saskatchewan Polytechnic, he leverages over two decades of experience in human resources, organization development and project management to create positive change and continuous learning for the students, clients and organizations he works with.

10:00–10:15 **COFFEE BREAK**

	TRACK ONE	TRACK TWO
10:15–12:00	**Picking Up STEAM: Essential Skills for Leadership in a Diverse Organization** (continued)	**Emotional Intelligence – Expanding Influence** (continued)

12:00-1:00

Luncheon Speaker: This Bud's for You

The Liberal government introduced the *Cannabis Act* in Parliament April 13, 2017. The purpose of the legislation is to allow adults to legally possess and use cannabis, however strictly regulating all aspects of its production and distribution. The Cannabis Act is to become law no later than July 2018. What impact will it have on the engineering and geoscience professions? What happens when an employee shows up for work high? What are the employer's rights? The employee's rights? These topics and more will be canvassed in this presentation.

Barry Nychuk is a member of Canadian Bar Association and the Saskatchewan Trial Lawyer Association. He has practised in all levels of the Court in Saskatchewan and has appeared before the Supreme Court of Canada. Since 1992, he has been a partner in Richmond Nychuk, a Regina law firm that presently has 12 lawyers.

In the past 20 years Mr. Nychuk has practised predominantly in the area of criminal law. Many cases Mr. Nychuk litigated were leading cases in the areas of marijuana trafficking, including R v Dunn, a lengthy court battle over trafficking of marijuana for "compassionate reasons."

1:00-2:45

TRACK ONE

Understanding the Skill Set of GRIT

Grit measures perseverance, a dogged determination in the face of difficulty or opportunity. Grit appears most clearly in efforts to accomplish that which holds meaning and value. In this session, we will: explore what constitutes grit and what makes it critical to success; examine strategies to encourage and develop grit; co-create ideas to lead with grit while inspiring it in others; and, discover methods to select and hire for grit.

To help you get the most out of our time together, please consider checking where you are on the Grit Scale days before the event by completing this 3-minute questionnaire at https://angeladuckworth.com/grit-scale/.

Rox Bartell is a performance consultant and executive coach and "holder of space."

Starting in the Securities Sector in the 1980's Rox realized the importance of projecting confidence while being grounded in knowledge and purpose. In roles from facilitator & internal consultant to CEO, she has learned the importance of dancing between head, heart, and gut energy to achieve optimal results.

TRACK TWO

Planned Adaptation to Climate Change: Prepare for the Unprecedented

If climate is the temperature and precipitation we expect, and weather is what we get, then climate change is unexpected weather. Recent flood events in Alberta, Saskatchewan and Quebec have been described as unprecedented. This suggests that they represent a change in climate, and/or that our historical records do not capture the full range of variability in these hydro-climatic regimes. In a changing climate, recorded weather and water levels can be an unreliable basis for decision making and design. The only reliable sources of information on future climate are numerical models that are able to simulate the dynamics of the regional hydroclimate. Different models, or runs of the same model, produce different future climates. The spread of projections for mid- to late 21st century results from the use of different model algorithms and greenhouse gases emission scenarios. In the near term, however, internal natural variability of the climate system is the main source of uncertainty. This talk explores what this means for predicting and adapting to climate change in Saskatchewan.

Dr. Dave Sauchyn, P.Geo., has been professor of geography and environmental studies at the University of Regina for the past 35 years. His main research interests are 1) the climate and hydrology of the past millennium and how knowledge of the past can inform scenarios of future climate and water supplies, and 2) planned adaption to minimize the adverse impacts of climate change. Dave recently co-directed a five-year interdisciplinary study of the vulnerability of agricultural communities to climate extremes in Chile, Argentina, Colombia and Brazil and the Canadian Prairies.

2:45-3:00 **COFFEE BREAK**

3:00-4:30

TRACK ONE

Understanding the Skill Set of GRIT

(continued)

TRACK TWO

Regina Wastewater Treatment Plant Upgrade Project (EPCOR)

EPCOR was awarded the public-private partnership to design-build, operate-maintain and finance a new highly technical wastewater treatment plant in Regina, Saskatchewan in May 2014. This $181 M project entailed the expansion and upgrading of the existing WWTP to meet the effluent permit requirements, with a substantial completion deadline of December 31, 2016. This project is one of the largest of its kind in North America and involved a tight schedule, non-traditional financing approach and a 30 year operating contract. The winning team included EPCOR (operator and financier), Stantec (design), Gracorp (financial advisor) and a construction joint venture team consisting of Graham Construction and Lockerbie Stanley Inc. (now AECOM).

This presentation will discuss the three years of the project, including challenges and lessons learned throughout the many phases of the project.

Vicki Campbell, P.Eng. is a professional engineer with over 20 years experience in the water wastewater industry. She has a regional environmental systems engineering degree from the University of Regina specializing in water, wastewater and environmental systems.

She joined EPCOR in 2010 as senior manager of northern Alberta operations, located in Fort McMurray, Alberta. After EPCOR Water Partners was awarded the Regina P3 project to design/ Build/finance, operate and maintain a new wastewater treatment facility in May 2014, Vicki moved back to Regina to develop and lead the new EPCOR Water Prairies business unit. For complete bios and abstracts visit the APEGS website: www.apegs.ca/Portal/Pages/fall-pdd

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.

	APEGS MEMBERS		NON-MEMBERS	
EVENT	EARLY BIRD (Prior to Sept. 15)	REGULAR	FULL-TIME STUDENTS	NON-MEMBERS
Oct. 16 a.m. (30 by 30) **What Does it Take to Lead?** **Why there is Value when Women Lean in**	$170	$225	$100	$250
Oct. 16 a.m. **Business Ethics**	$170	$225	$100	$250
Oct. 16 – Lunch **Saskatchewan Geology**	$50	$50	$50	$50
Oct. 16 p.m. (30 by 30) **Empowering Women in their Professional Lives**	$170	$225	$100	$250
Oct. 16 p.m. **Mentoring the Millennial Generation**	$170	$225	$100	$250
Oct. 17 - Women's History Month Breakfast **Picking Up STEAM – Why Diverse Organizations Win**	$30	$30	$30	$30
Oct. 17 a.m. (30 by 30) **Picking Up STEAM: Essential Skills for Leadership in a Diverse Organization** (includes WHM Breakfast)	$200	$250	$115	$280
Oct. 17 a.m. **Emotional Intelligence – Expanding Influence**	$170	$2250	$100	$250
Oct. 17 – Lunch **This Bud's for You**	$50	$50	$50	$50
Oct. 17 p.m. (30 by 30) **Understanding the Skill Set of GRIT**	$170	$225	$100	$250
Oct. 17 p.m. **Planned Adaptation to Climate Change: Prepare for the Unprecedented** **Regina Wastewater Treatment Plant Upgrade Project**	$170	$225	$100	$250

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) and register under "Meetings."

Looking for Accommodations?
APEGS has negotiated a rate of $115.00/night, plus taxes, at the Executive Royal Suites for October 15, 16 & 17, 2017. Reservations can be made directly with Marriott Reservations at 1-800-853-1181 and ask for the Group Code rate "APEGS." Rooms are being held until September 15th.

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

Call for Award Nominations

The Awards Committee is seeking nominations for the APEGS Awards as well as other provincial and national awards such as the Saskatchewan Order of Merit, the Order of Canada, the Canadian Engineers' Awards (Engineers Canada) and the Canadian Professional Geoscientist Award (Geoscientists Canada).

If you know of a Professional Engineer or Professional Geoscientist who should be considered for an award, or an exceptional engineering or geoscience project that should receive an award, the committee would like you to nominate that member or project. There are seven APEGS awards: the Exceptional Engineering/Geoscience Project Award, the Environmental Excellence Award, the Friend of the Professions Service Award, the Promising Member Award, the McCannel Award, the Brian Eckel Distinguished Service Award, and the Outstanding Achievement Award. Criteria for each of the awards are contained in the nomination form that appears on the next page.

In addition to the APEGS Awards, the Awards Committee nominates APEGS members for awards presented by both Engineers Canada and Geoscientists Canada. Nominations for awards must be received by November 30 to provide time for the Awards Committee to review and consider the nominations for the annual APEGS Awards and to prepare nomination packages for provincial and national awards. The Awards Committee will develop and maintain a list of nominees for consideration for the various awards.

Nomination form on following page.

Please send nominations to:
APEGS Awards Committee
300 - 4581 Parliament Avenue
Regina SK S4W 0G3
Fax: (306) 525-0851
Email: apegs@apegs.ca

Nominations for APEGS Awards

Do you know an individual or a group who should be considered for an award?

I would like to nominate: .....

In the following category: .....

Exceptional Engineering/Geoscience Project Award
Accomplishments in Engineering/Geoscience (100%). The project team must be made up predominantly of Saskatchewan engineers and/or geoscientists. The project may be located inside or outside of Saskatchewan. The award will be granted when the efforts of an individual or team of engineers/ geoscientists is deemed to be of great significance.

Environmental Excellence Award *(all professional members of APEGS are eligible)*
Environmental awareness, preservation, protection and reclamation through education, leadership and/or involvement (25%). Enhancement of quality of life by improvement of the physical or social environment through engineering, geoscience or other works (10%). A real extent of environmental protection or preservation as a result of the efforts (50%). Prevention of potential environmental impacts vs. correction/remediation of existing impacts (15%). This award is intended to have broad scope and be open to a wide range of projects, achievements, initiatives and activities contributing to the protection and preservation of the environment.

Friend of the Professions Service Award *(available to anyone who is not a member of APEGS)*
Recognizes contributions by an individual or a group in the support and promotion of the professions (100%). Examples of activities include: documentation of the history of the professions; comprehensive media coverage of an outstanding engineering or geoscience achievement; long-time service on an APEGS committee or other form of contribution to the success of activities promoting the professions to the public.

Promising Member Award *(available to any member who has held P.Eng./P.Geo. for less than 5 years)*
Accomplishments in Engineering/Geoscience (50%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (25%). Service to community (25%).

McCannel Award
Accomplishments in Engineering/Geoscience (20%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (70%). Service to community (10%).

Brian Eckel Distinguished Service Award
Accomplishments in Engineering/Geoscience (35%). Service to the professions in public education and/or active participation in engineering/ geoscience associations, societies, institutes (35%). Service to community (30%).

Outstanding Achievement Award
Accomplishments in Engineering/Geoscience (70%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (20%). Service to community (10%).

I am nominating this person / project because (25 words or less):

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Other references (professional and community service related) to contact include:

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Submitted by:

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DCS | DESIGN COUNCIL OF SASKATCHEWAN

Premier's Awards *of* Excellence in Design

DESIGN WEEK

SASKATOON
REGINA
SEP 23–29, 2017
designcouncil.sk.ca

SASKATOON SEP 23 **LAUNCH**

GANDHI SASKATOON SEP 25

SASKATOON SEP 26 **BRIGNELL**

KASPER SASKATOON / SEP 27 REGINA / SEP 28

REGINA / SEP 27 SASKATOON / SEP 28 **MAZUMDER**

AWARDS SASKATOON SEP 29

Premier's Awards of Excellence in Design
CALL FOR ENTRIES COMING SOON!

The entry package will be released soon.
Submission deadline is August 31!

designcouncilsk

Struggling with your Continuing Professional Development Program?

BY MARCIA FORTIER, P.GEO., A.SC.T.

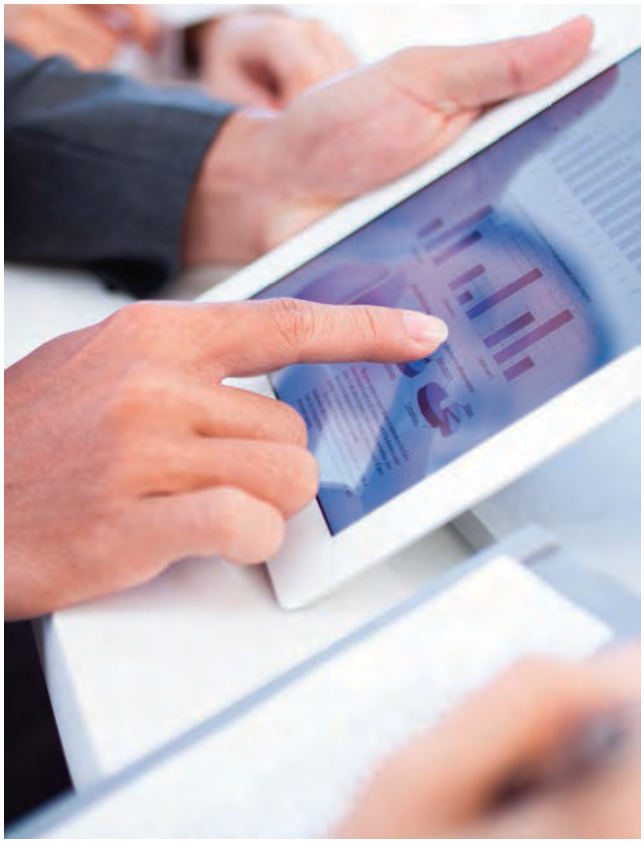
Let's face it: at some point in our careers, we have all struggled with our APEGS Continuing Professional Development (CPD) programs.

You could be:

- a recent member who doesn't know where to start;
- an experienced member out of CPD ideas; or
- a license waiver holder.

While at first glance the program can appear daunting, the truth is that obtaining CPD credits is not as challenging as it appears.

The best place to start is to review the APEGS CPD Members' Guideline. This document highlights members' responsibilities, outlines how to set up a CPD program, and describes each CPD credit category. Due to the diverse nature of the engineering and geoscience professions, the APEGS CPD program provides members with a program framework only, allowing members to tailor their program to suit their individual needs.



Still stuck?

The easiest place to start is with the Professional Practice category. If you have been working full-time in engineering or geoscience since January 1, you have already earned 50 credits in Professional Practice by June. Remember, for every 15 hours of professional work, you earn one CPD credit. Additional credits earned in the year can be carried forward for two years.

The next are Informal Activity and Formal Activity categories. Ask yourself these questions:

What professional weaknesses have you recently struggled with? (i.e. technical writing, project management, etc.)?

- Have your colleagues or a mentor suggested beneficial courses they have completed?
- Do you need to update some of your safety or regulatory/standards certifications?
- Is there a new direction you would like to take your career?
- Have you attended any conferences or workshops?

Beneficial courses should build on your current work and assist you on your future career path. Evaluate each course or workshop to ensure it's applicable to your CPD plan. A good rule of thumb for determining which courses qualify for which CPD credits are that courses that award a grade or certificate at the end are considered Formal CPD while those that do not are considered Informal CPD.

While some think only technical training qualifies for Formal CPD, many soft-skill courses also qualify. Courses on communication, presentations, technical writing, mentoring, time management, ethics, safety and leadership all qualify.

Are you struggling to find course offerings? Here are some ideas on where to look:

- the calendar section in the *Professional Edge*;
- the events section on the APEGS website homepage; and
- the webpages of local constituent societies such as CIM, Saskatchewan Geological Society, SEIMA, ACEC-SK or the local engineering / geoscience societies.

Informal activities are another way to expand your knowledge and learn new skills.

Conferences, workshops, lunch and learns or local constituent society events are all opportunities to earn informal credits, but self-directed study also qualifies, including:

- professional journal articles;
- textbooks; and
- technical manuals.

As an APEGS member, you are eligible for a free University of Regina or University of Saskatchewan library card to help expand your self-directed study.

Volunteering is another great way to get involved and earn Participation CPD credits. Not only does volunteering give back to the community, it allows members the opportunity to network and may even lead to future presentation opportunities. You can earn 10 participation credits a year just by volunteering in your community. With the summer weather upon us, many communities are hosting summer festivals that need many volunteers.

Overall, CPD is an individual's commitment to continually improve their professional knowledge base. Each activity assists members in fulfilling their obligation to remain competent in their profession. A CPD program is a starting point that allows a member to grow and to continuously evaluate their work experience and peer interactions. A CPD program should be flexible and tailored to the member.

Go to Where the People Are!

Seems like obvious advice, but it took walking around the Winnipeg Fringe Festival last year and seeing the response to the Engineers Without Borders tent to realize the opportunity we have in Saskatchewan to reach out to the public at our provincial festivals.

Repeated surveys conducted by APEGS and Engineers Canada show that the public does not understand what our professions of engineering and geoscience are doing to contribute to society, despite being surrounded by and interacting daily with the work of thousands of engineers and geoscientists. It's not their fault: most engineering and geoscience work is business to business and the results are just there. However, this gives us an opportunity to engage, be seen and talk about the professions.

30 by 30 has identified attraction to the profession as one of our key focus areas. This year the task group wanted to experiment with reaching out to children and their parents at some of the most popular festivals in the province, the Regina Cathedral Village Arts Festival and the Saskatoon Children's Festival.

Some of the girls who will be entering our professions in 2030 are currently in grades 2 and 3. We want to let them and their parents know that engineering and geoscience is a great career path and that they are welcome.

Thanks to the efforts of 30 by 30 task group members Ben Frietag and Catherine Griffith, P.Eng, APEGS was able to partner with EYES and SciFi. We were able to engage a number of APEGS volunteers to talk to children and their parents. We had the K-12 Committee's Tego blocks for the kids to play with, 30 by 30 buttons to hand out and additional brochures to give parents as we talked to them and their children played with the building toys. The eagerness to build with the Tego blocks was immediate, with a number of cars and structures being built, including a tower by a very promising kindergarten boy.

The team volunteering at the Cathedral Arts Festival estimated reaching over 250 kids and their accompanying parents in just one day. At the Saskatoon Children's Festival the group estimates we talked to about 500-600 kids and parents each day that we were present.

The engineering giveaways were a great hit. As one of our volunteers noted, "The kids loved the pencil sharpeners and superhero pins! Some of the little girls particularly liked that they had girls on the pins. None of the boys seemed to mind that either."

We also noted parents and volunteers wanted a set as well. The feedback from our volunteers at the two events has been excellent on how to improve for next year: more days, more geoscience activities, goodie bags and a better means of anchoring our banners.

Most importantly, APEGS was able to have meaningful conversations with people about why science is important and what it is that engineers and geoscientist, do for society. It's definitely worthwhile to go to where the people are. Thank you to all our volunteers. 30 by 30 looks forward to working with you again.

PHOTO: Children's Festival – volunteer: Anna Qureshi

ANNOUNCEMENT OF APPOINTMENT

Sheena August

APEGS Communications Manager

Bob McDonald, P.Eng., Executive Director and Registrar, is pleased to announce the appointment of Sheena August as Communications Manager.

Sheena graduated from the University of Regina with a Bachelor of Arts in English and Linguistics (double major) in 1995 and a Certificate in Public Relations in 2010.

Prior to joining APEGS, Sheena was the manager of communications for a school division and worked in communications and stakeholder relations for various ministries of the Government of Saskatchewan. Her career experience includes strategic communications planning, media relations, event management, desktop publishing and web design.

Sheena is a board member of the Regina chapter of the International Association of Business Communicators.

CELEBRATE

Women's History Month

The Women's History Month Committee has partnered with APEGS to participate in the Fall Professional Development Days as part of the track sessions being presented by the APEGS 30 by 30 Task Group.

This year's event will be a breakfast:
Tuesday, October 17, 2017
Shumiatcher Room, Conexus Arts Center, Regina

Registration at 7:15am, Breakfast at 8:00am with
keynote speaker Brianna Brownell
Picking Up STEAM –
Why Diverse Organizations Win
to follow. Cost = $30

Register through the events page on the APEGS website
www.apegs.ca

For more information, contact:
reginawhm@gmail.com

Professional Development Profile

Sherri and her husband, Conrad, at the Mosaic Stadium Open House.

Name:

Sherri Doidge, M.A (Leadership), P.Eng., P.Geo.

About Me:

On June 21, my husband and I celebrated 20 years of marriage. We live on an acreage north of Regina with our two teenagers.

Job Responsibilities:

I have held diverse roles at Mosaic including operations, engineering and continuous improvement.

Professional Development Activities

(what do you do to gain CPD credits)

Formal Activity:

- Technical and safety courses including EPIC courses and Six Sigma Training
- Master's in Leadership at Royal Roads University
- Mosaic internal training programs

Informal Activity:

- Reading *The Professional Edge* and the *Construction Law Letter*
- Attending seminars and forums
- APEGS Lunch and Learns
- APEGS Annual Meeting Track Sessions
- Attending the U of R Inspiring Leadership Forum a Deloitte Leadership breakfast

Participation:

- Judging elementary school science fairs
- Served a term as an APEGS Councillor
- Participate on numerous committees
- Mentoring others including an international student
- Member of the organizing committees for Women's History Month and CCWESTT 2014
- Board member for a local gymnastics club.

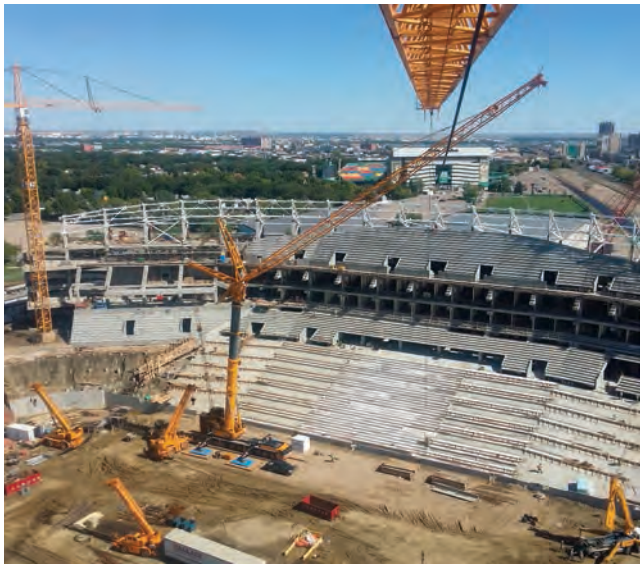
Presentation:

- Presented engineering at high schools, career fairs and EYES camp
- Presented at the APEGS Annual Meeting

Describe how your development activities help increase your knowledge and competency at your job:

All of the many developmental opportunities have helped me in my job, especially when I was delving into "new to me" areas such as continuous improvement, equipment and piping design, contract administration and management as well as leadership. This development increased my ability to be successful in my goals which results in value to my company.

Mosaic Stadium – A Mission: Zero Project



1.95 million work hours. Zero lost time injuries.

Construction of the new Mosaic Stadium was one of the most-watched building projects in Saskatchewan history.

The build started in June 2014 with the removal of 300,000 cubic metres of soil (enough to fill about 110 Olympic-sized swimming pools, according to the riderville.com website). In August 2016, 26 months and 1.95 million person-hours of labour later, the project was substantially complete. At the peak of construction, there were 630 workers on site.

Despite the complexity of the project, heavy equipment, weather conditions and multiple contractors, PCL is proud to report new Mosaic Stadium was completed as a Mission: Zero project. There were zero lost time incidents on the job, meaning there were no injuries requiring time away from work beyond the day of the injury.

"On-site safety was driven by the workforce itself," said Mike Zurowski, construction manager for PCL Construction Management Inc. "They cared about it and they worked hard to make sure everyone went home safe."

As in every PCL build, all workers on site, including contractors, attended a project-specific orientation to explain the PCL safety system, expectations on site and responsibilities of the workers, contractors and PCL.

Zurowski and Anders Wheeler, district HSE manager for PCL Regina District, credited the consistency of the PCL orientation and the vigilance of supervisors and workers for the safety success. When every worker on site is following the same safety protocol, it builds the culture of the work environment and alleviates risk.

"Stadiums are challenging," Zurowski explained, "They are made from different materials. You never know what you will be up against weather-wise, no matter where in the country you will be working. They take a lot of planning and it takes a real consistent approach in how you manage it. The beauty of PCL is that we are a large company, so we can reach out across the company and get information when we need it."

The other challenge with the stadium build was the fast-paced timeline. This could have added to the risk to workers and the pressure on supervisors and contractors. However, Wheeler and Zurowski again credited the orientation process and workers for maintaining PCL safety standards.

"The orientation establishes the culture within the site and the project. We really strive to have everyone building our culture and improving our safety. It's that idea that it's better to have 10 sets of eyes than two," said Wheeler.

While every stadium build is interesting, Wheeler and Zurowski said this local project's emotional connection to the workers made it special. The workers knew they were building a place that they and their families would come to for generations.

The pride on site was apparent as the job reached completion.

"We had 1,500 employees who had a part to play in building that iconic building," recalled Zurowski. "Whether you're a Rider fan or a construction worker or Saskatchewan resident, all of us were proud our kids and grandkids will know we had a part in building it."

ACEC-SK Introduces New 2017-2018 Board of Directors

Paul Walsh, P.Eng.

Effective May 11, 2017, Paul Walsh, P.Eng., assumed the Chair of the Association of Consulting Engineering Companies - Saskatchewan (ACEC-SK) board of directors. Walsh is the 40th chairperson in the association's history.

He was appointed as a director on June 11, 2013, elected as Director in May 2014, secretary-treasurer on June 5, 2015, vice chair June 2016 and 2017-2018 Chair at the Association's AGM on May 11, 2017.

Walsh is joined by Bryce Hunter, P.Eng., Vice Chair, Nancy Inglis, P.Eng., PMP, secretary-treasurer and Jeff Halliday, P.Eng., Past Chair as the board executive.

These individuals will lead the 2017-2018 board of directors composed of directors Greg Daum, P.Eng., Trevor Knoll, P.Eng., Ryan King, Patrick Lalach, P.Eng., ACEC-Canada Liaison Lawrence Lukey, P. Eng., Young Professionals Liaison Matt Feige, P.Eng., APEGS Liaison Tara Zrymiak, P.Eng., and Associate Member Liaison Shane Baillargeon, MBA.

"Paul has been a great asset to our association for a number of years," said Executive Director Beverly MacLeod. "He acknowledges that our members are currently facing broad and rapid industry changes. Paul will help drive our industry dialogue in new directions and provide strategic leadership for ACEC-SK on the issues facing our industry."

The Association of Consulting Engineering Companies - Saskatchewan (ACEC-SK) is a non-profit association representing the interests of the majority of consulting engineering and consulting geoscience firms in Saskatchewan. As the business voice of the Saskatchewan consulting engineering and geoscience industry, ACEC-SK is the link between private industry, government, purchasers, decision makers and owners.

PST Ruling in Consulting Engineering Industry's Favour! Now What?

Prior to the 2017 Saskatchewan provincial budget, contract administration performed by consulting engineers had been PST exempt. The new budget's requirement that construction servicers be PST chargeable suddenly shone the spotlight on the engineer's role in the construction phase of a project. The onus was now on ACEC-SK to explain the difference between contract administration and construction management.

ACEC-SK communicated with the Ministry of Finance to explain the difference between the two industry terms and the reasoning for the long-standing contract administration PST exemption. The ministry subsequently decided that PST charged for engineering services essentially remains status quo, with two exceptions:

- EPC (engineering, procurement and construction)
- Computer services performed by engineering companies will be PST chargeable.

The most important take-away from this decision, however, is that consulting engineering firms must now clearly indicate on their invoices which categories of services they are performing (per ACEC-SK's recommended schedule of fees). If it is not clear, then the Ministry of Finance will charge the full PST for those services.

2017 ACEC-SK Annual Conference & AGM

SUBMITTED BY LINDA NELSON

ACEC-SK's Annual General Meeting on May 11, 2017 was combined with the Informed Infrastructure Investment Conference. Members, presenters and stakeholders expressed appreciation for the combined conference.

Speakers offered new perspectives on complex topics addressed throughout the day. Both experienced and less experienced professionals learned from the sessions.

Ryan Greer, director, transportation and infrastructure policy, presented the Canadian Chamber of Commerce perspective on federal infrastructure investment and implications at the provincial level.

Larry Hiles, representing the Certified Management Consultants Saskatchewan (CMC) presented options for the province as it faces a $51 billion infrastructure deficit.

Miguel Morrissette, executive director of SaskBuilds addressed the province's integrated capital plan and its role in addressing informed infrastructure investments.

The afternoon agenda addressed topics targeted towards ACEC-SK's young professionals.

John Gamble, P.Eng., ACEC-Canada, presented the national association's take on how the profession must deal with change.

The pros and cons of project delivery model options were presented by Stormy Holmes, P.Eng., FEC (AECOM) and Patrick Lalach, P.Eng. (CIMA +).

The Young Professional Panel, Chelsey Bartlett (Golder Associates), Alyson Stout, Engineer-In-training (McElhanney) and Tyson Smith (KGS Group) addressed the question, "What does informed infrastructure Investment mean to YPs?"

Chris Newcomb, P.Eng., (McElhanney) spoke to the young professionals role in alternative delivery models.

The success of this joint event ensures that the format will become the standard at future ACEC-SK annual meetings.

News Beyond Our Borders

BBC.com

Diesel pollution vastly underestimated, contributes to global deaths

Associated Press - Pollution from diesel trucks, buses and cars globally is more than 50 per cent higher than levels shown in government lab tests, a new study says.

That extra pollution translated to another 38,000 deaths from soot and smog in 2015, the researchers estimated.

The work published Monday in the journal *Nature* was a follow-up to the testing that uncovered the Volkswagen diesel emissions cheating scandal. Researchers compared the amount of key pollutants coming out of diesel tailpipes on the road in 10 countries and the European Union to the results of government lab tests for nitrogen oxides.

They calculated that 4.6 million more metric tons was being spewed than the lab-based 8.5 million metric tons. Governments routinely test new vehicles to make sure they meet pollution limits.

Experts and the researchers don't accuse car and truck makers of cheating, but say testing is not simulating real-world conditions.

The researchers included a team from the International Council on Clean Transportation, a non-profit research and advocacy group, that arranged the testing that first showed VW diesel cars were rigged to cheat on emissions tests. They used previously published tests of pollutants coming from thousands of vehicles, all models, to calculate the extra pollution in 2015. Worldwide, three-quarters of that extra pollution is from trucks and buses.

Part of Earth's crust fell from the sky, new research suggests

CBC News - Scientists at Montreal's McGill University have added to the common theory about how the Earth's crust was created.

Researchers looked into a theory that not all of the Earth's crust was formed from the inside out, but that some of the crust fell to Earth from the atmosphere.

They described it as "raining marbles," or silicate rain, formed by the high temperatures on the Earth's surface. This process helped create some of the earliest rock specimens known today.

The researchers tested their theory in a lab using a mixture of silicate earth materials and water, put under extreme temperatures and high pressure. The results are published in the journal *Earth and Planetary Science Letters*.

The discovery could help other researchers trying to find signs of life on other planets. Silicate rain is believed to have been observed on some exoplanets.

ROM scientists name new dinosaur species after *Ghostbusters* villain

CBC News - Scientists from the Royal Ontario Museum have recently discovered the fossil of a 75-million-year-old species of armoured dinosaur, or ankylosaur, which was unusually well-preserved – and oddly familiar to movie buffs.

Meet Zuul crurivastator – destroyer of shins – whose discovery is being discussed in the *Royal Society Open Science* journal.

The name was inspired by the *Ghostbusters* villain Zuul, says Victoria Arbour, paleontologist and post-doctoral fellow at the ROM and University of Toronto.

The plant-eating species has a short, rounded snout and prominent horns behind the eyes. A large knob of bone at the end of its stiffened tail could have been used to strike predators in the legs (hence the name destroyer of shins) or for battling others for territory or mates, the scientists said. The tail is 3 metres long and covered in rows of large bony spikes, adding to its menace.

Finding a full dinosaur skeleton is a rare feat, Arbour said, and is especially uncommon for this group of dinosaur.

It's also rare to find an ankylosaur skeleton well-preserved, because the armour is part of the skin, she said, which would tend to get washed away from the skeleton.

With this discovery, scientists have the full skull, tail, body, armour and even some preserved soft tissue, she said.

The fossil was found in the Judith River Formation in Montana, just 25 kilometres south of the Alberta border, Arbour said. It was uncovered when a crew of private excavators bumped into the skeleton buried under metres of rock while unearthing a nearby tyrannosaurus.

CBC

Compressed air energy storehouse approved for old Goderich salt cave

CBC News - Goderich city council has approved a proposal by a Toronto company to pressurize an abandoned salt cavern and later release the compressed gas to create clean energy.

The decision comes despite some opposition from residents who said they were concerned not enough is known about the project – a first in the world.

The project is being touted by NRStor, a private Toronto company that operates a project near Guelph involving flywheels. Their flywheel project uses cheaper energy, for example at night, and rotates a steel drum which stores kinetic energy. Later the spinning drum is rotated to release its energy and generate power.

Goderich is known for its rock salt mines. The cavern where this project would take place is located on property owned by Compass Minerals in a mine located 550 metres under Lake Huron – the largest underground salt mine in the world.

As part of the project, compressed air will be kept in the sealed cavern and heat generated from compressing the air will be stored in tanks. Later when there's a need for energy, the compressed air will be heated using the stored heat and then released into a generator. The electricity created will feed into the provincial energy grid.

It's similar to projects in Germany and the US. However in other installations, natural gas is used to heat the compressed air.

Researchers at the Waterloo Institute for Sustainable Energy at the University of Waterloo are involved in the project.

Maurice Dusseault, P.Eng., a professor in engineering geology, said in a presentation last September the salt conditions along the Ontario coast of Lake Huron are ideal for massive renewable energy storage.

TECH CORNER

Uber launching Toronto branch of self-driving car research group

CBC News - Attention, AI pecialists: Uber's hiring. The hyper-disruptive ride-hailing company announced Monday it will open a new research hub in Toronto dedicated to perfecting the self-driving car, joining its two American research centres in Pittsburgh and San Francisco.

Uber's release also promised to hire "dozens" of researchers in the Toronto-Waterloo corridor to help flesh out the project.

Uber's new hub will have strong ties to the recently announced Vector Institute for Artificial Intelligence, a research facility being funded in part by the provincial and federal governments, that aims to put Canada at the front of the pack of global AI research.

Uber made a multi-year pledge to give at least $5 million a year to the fledgling institute.

The race is not without speed bumps: in March, a self-driving Uber SUV that was being tested in Tempe, Arizona, was involved in a collision and flipped onto its side. Police later found that the self-driving car was obeying the law.

CN investing $500 million in technology with eye on driverless truck threat

Canadian Press -Canadian National Railway says it will spend $500 million over the next five years on technology to improve its safety, efficiency and competitive edge, partly in response to the potential threat posed by driverless trucks.

CEO Luc Jobin told an investor conference that the country's largest railway will make the investments to improve operations and stay ahead of changes to the trucking sector that are expected to evolve quickly over the next decade.

CN's plan would see a rise in automation, cutting labour costs spent conducting track inspections and reducing manual and clerical work, Jobin said. He declined to say how many jobs could be lost.

CN plans to spend $28 million this year to acquire additional monitoring equipment for the early detection of train defects that would allow it to intervene before problems arise.

It has already implemented some new technologies which were on display at the investor conference and is conducting trials on others. The company is using personal devices such as Readiband to monitor and record employee fatigue and alertness.

News From The Field

ENERGY

DeSmog Canada

SaskPower exploring geothermal power

SaskPower news release - The province of Saskatchewan, SaskPower and private geothermal developer DEEP Earth Energy Production Corp. (DEEP) have signed a power purchase agreement that will allow further research into the potential for Saskatchewan's first geothermal power project.

Geothermal power generation passes hot water through an exchanger, creates steam and drives a turbine to produce electricity. The signed agreement allows DEEP to continue a proof of concept study to determine the feasibility of a 5-megawatt project near Estevan. The proposed plant would generate renewable, zero emission, baseload power from a hot aquifer 3 kilometres under the Earth's surface.

The electricity provided by the proposed plant would generate roughly the power required by 5,000 homes and offset about 40,000 metric tonnes of carbon dioxide per year – equal to taking over 8,000 cars off the roads annually.

New Sask hydro project on hold

Saskatoon StarPhoenix - A $630-million hydroelectric project in northern Saskatchewan could be put on hold indefinitely due to decreased mining activity in the region.

At one point, the Tazi Twé hydroelectric project in Black Lake was supposed to have been completed by 2017. But construction has not begun and a SaskPower spokesman says the Crown corporation is conducting an economic assessment of the project to see if starting construction is a smart move or not.

The need for power in northern Saskatchewan is largely driven by mining operations, which have experienced a slow-down in the last decade.

Tazi Twé – a water diversion hydroelectric project that would supply 50 megawatts of power to the provincial power grid –has been in the works for more than 20 years. SaskPower and Black Lake First Nation signed an agreement in principle in 2013 to work together on the project, which was expected to be the first new hydro project in Saskatchewan in more than 30 years and the first power production project built entirely on First Nations land in the province.

Estimates suggest it would have brought $1.3 billion into Black Lake over the project's 90-year lifespan.

The Tazi Twé board hopes to look at an economic assessment of the project by the end of the year and will then make a recommendation about whether to move ahead with it.

Saskatoon bridging to sustainable future

Saskatoon StarPhoenix - Saskatoon residents can catch a glimpse of the city's sustainable energy future just southwest of Circle Drive near the Montgomery Place neighbourhood.

The City of Saskatoon and several partners have installed 92 solar photovoltaic panels to produce energy to help power the nearby landfill gas generation facility.

The city partnered with Saskatchewan Polytechnic, the Saskatchewan Environmental Society (SES) and the SES Solar Co-operative Ltd. for the project. Dozens turned out for an open house at the landfill gas facility on Tuesday.

The solar panels are expected to produce about 40,000 kilowatt hours per year, enough to provide 40 per cent of the power for the landfill gas facility. The panels are adjustable so they can be moved to capture more sunlight at different times of the year.

The amount of energy produced by the panels would be enough to power four 1,200-square-foot bungalows, but the project's symbolic power is seen as much greater.

The SES Solar Co-operative allows Saskatchewan residents to invest in the installation of solar panels and increase the amount of solar power produced in the province.

The solar demonstration project helps power the exhaust and

cooling fans, lighting and computer equipment at the landfill gas facility. The facility converts gas into energy, which amounts to about 1.5 per cent of the energy needed to power the city.

City hall has set a goal of producing 10 per cent of city-wide energy through local renewable resources.

Manitoba pitches east-west power grid

Canadian Press - Manitoba's energy minister is recharging the idea of building an east-west power transmission grid and says the federal government needs to help.

Manitoba Minister of Growth, Enterprise and Trade Cliff Cullen told the Energy Council of Canada's western conference that Manitoba has "a really clean resource that we're ready to share with our neighbours" as new hydro generation projects come online.

"We've been focused on transmission . . . north and south, and we haven't had that dialogue about east-west."

Most hydro-producing provinces currently focus on exports to the United States.

Saskatchewan Energy Minister Dustin Duncan said his province, which relies heavily on coal-fired electricity plants, could be interested in getting electricity from Manitoba, but is cautious.

"They're big projects. They're multi-billion-dollar projects. Even trying to do the interconnects to the transmission grid, I don't think they're as easy or as maybe low cost as we would just imagine, just hooking up some power lines across the border. It takes much more work than that."

Cullen said there's a lot of work to do on building east-west transmission lines if provinces are going to buy and sell electricity from each other. He suggested that money is a key factor.

"Hopefully the federal government will be at the table to have a look at that because it's a fundamental expense, a capital expense, to connect our provinces."

The idea of developing an east-west transmission grid has long been talked about as a way to bring energy reliability to Canadians.

At their annual meeting in 2007, Canada's premiers supported development and enhancement of transmission facilities across the country, although the premiers fell short of a firm commitment to an east-west energy grid.

OIL AND GAS

Oil drilling may beat projections

CKOM Radio - More oil wells are expected to be drilled in Saskatchewan in 2017 than originally forecast.

The Petroleum Services Association of Canada (PSAC) is forecasting a major increase of oil and gas activity in the province.

An update stated approximately 2,670 oil wells will be drilled, up from 1,940 wells in the original forecast.

PSAC said the number of wells drilled in the first three months of 2017 is 856, compared with 399 wells drilled during the same period in 2016.

PSAC estimates 6,680 wells will be drilled in Canada in 2017, an increase of 2,505 wells and a 60 per cent increase from the original 2017 drilling activity forecast released in November 2016.

2016 "a pretty lean year" in oil

Pipeline News - "2016 was a pretty lean year," said Melinda Yurkowski, Saskatchewan's assistant chief geologist with the Ministry of Environment, when she provided the Saskatchewan update to the Williston Basin Petroleum Conference on May 3.

There were 1,650 wells drilled in Saskatchewan, slightly less than the 1,838 in 2015.

"The very good news is we've seen an increase in drilling in 2017," she said. By March 31, there were 856 wells drilled in Saskatchewan, of which 723 were horizontal. That's over double the pace of the previous year for the same time period.

She noted that the Petroleum Services Association of Canada recently revised its forecast to 2,670 wells for this year.

Almost 90 per cent of wells drilled in Saskatchewan are horizontal now. The average length in 2016 was about 2 100 metres, a slight increase from the year before.

In 2016, there were a total of 52,786 active oil and gas wells, 31,022 inactive wells, and 425 abandoned wells. In 2015, there were 55,247 active wells, 27,614 inactive wells and 958 abandoned wells.

Oil production is down from a peak in 2014. Production in 2016 was about 460,000 bpd, compared to 486,000 bpd in 2015. Light oil was about 38 per cent of production, medium oil was about 21 per cent, and heavy oil was about 41 per cent.

Roughly 30 per cent of production in southeast Saskatchewan came from the Bakken in 2016. The Bakken produced 45,464 barrels of oil per day, down from about 54,000 bpd in 2015. The high was in 2012, when Bakken production peaked around 65,000 bpd.

Land sales brought in $53.5 million in 2016, down from $56.48 million in 2015.

MINING

Hopeful signs for potash

Mining.com - Potash Corporation of Saskatchewan reported a higher-than-expected quarterly profit thanks to lower costs and increased sales volumes.

The company expects potash demand to remain strong this year, adding that its 2017 earnings outlook has improved since January on the back of recovering prices, which are finally helping producers turn around their fortunes.

The firm kept its forecast for worldwide industry potash shipments of as much as 64 million tonnes for 2017, up from 60 million in 2016. But it increased expectations for the Latin American market and noted that China, the largest buyer, is now seen consuming as much as 15.5 million tonnes.

A global oversupply of the fertilizer has caused prices to tumble in the last decade, leading to layoffs, mine closures and reduced capacity across the sector as the downward trend became more dramatic in the past two years.

Vanguard Potash making progress in tough market

Saskatoon StarPhoenix - After months of aggressive cost-cutting, Saskatchewan's beleaguered potash industry appears to be turning the corner, with established mining companies recording higher profits and several new firms working to develop greenfield projects.

The latest is Vanguard Potash Corp., a joint venture formed last month by Gensource Potash Corp. and Essel Group ME Ltd., which says it could have a mine that does not require surface tailings deposits operating near Tugaske by 2019.

"The first one is a huge deal for us," said Mike Ferguson, P.Eng., a potash industry veteran who steered Potash One Inc. to its 2010 friendly takeover by K+S AG before forming Gensource with the notion of "disrupting" the industry.

That disruption hinges on building small "selective dissolution" mines about a tenth of the size of most conventional underground operations and then selling 250,000 tonnes of potash on long-term contracts each year.

Vanguard's formation was a significant victory for Gensource, but the joint venture still has major hurdles to clear before it can start work on the mine northwest of Moose Jaw, which could create 400 construction jobs and 46 permanent ones.

The company is about 90 per cent done its feasibility study, expects to apply to the provincial government for environmental approval this month, and is working toward raising the US$200 million it needs to build the mine.

Analysts have questioned the ability of junior firms to compete with established companies like Potash Corp. of Saskatchewan Inc. Last summer, Karnalyte Resources Inc.'s plan to do just that failed after its financing fell through.

Ferguson admitted there are significant risks, including the major miners being able to "bleed" longer in an oversupplied market, but said the joint venture will be at least partially shielded from market forces.

"The important part is that we will have the guaranteed sales. Coupled with our very low operating cost (which is estimated to be around US$42 per tonne), that should keep us solvent."

Vanguard's announcement comes as Encanto Potash Corp. works to build a $3 billion mine on a First Nation near Regina, and days after BHP Billiton revealed plans to get its under-construction Jansen mine running as soon as 2023.

UNIVERSITIES AND RESEARCH

U of S program focuses on indigenous ingenuity

Saskatoon StarPhoenix - Sean Maw, P.Eng. wants young students to take another look at the humble canoe or kayak.

"They've been around for hundreds of years," said Maw, a University of Saskatchewan College of Engineering professor. "What does that tell you about them as designs? That they're good — and they're indigenous designs; they came from Canada's indigenous peoples."

A new U of S program aims to spread the word about indigenous ingenuity — from watercraft to weapons to traps to living quarters to snowshoes — to public schools across the country and inspire indigenous youth to consider engineering as a career.

Everyone involved in the project is excited; nobody has done this work systematically before, and it's an opportunity to document a neglected part of Canada's history, Maw said.

"We are under-represented in the college and in the profession," Indigenous Peoples Initiatives coordinator Matt Dunn, P.Eng. said.

"There's so much value to having a diverse workforce and the diverse thinking, the diverse processes that First Nations, Metis and Inuit engineers . . . can provide will really help enrich the engineering profession."

Traditional indigenous design was different than modern techniques, which focus on analyzing and solving specific problems, Maw said.

"It was more deeply embedded in culture, and it was a more gradual process over decades — and I would say not coincidentally, you ended up with better designs of things like canoes. And they were very sustainable designs. I mean they were not wasteful. They were very resource efficient, they were very functional."

"I think there's lots of positive lessons to be learned there and I think if this brings pride to indigenous kids who are learning about it, I think that would be fantastic … And if it brings respect to Canada's first peoples, I think that would be a great thing, too."

U of S studying glaciers

Saskatoon StarPhoenix - The University of Saskatchewan is opening a research facility near the Rocky Mountains to study the effects of climate change on Canada's waters.

The new Coldwater Laboratory in Canmore, Alberta will be used to study the retreating glaciers and nearby water sources in the mountains to get a better understanding of how climate change will affect nearby communities.

John Pomeroy, a professor of geography at the U of S and Canada Research Chair in water resources and climate change, said his team can better understand how waterways work in Saskatchewan by conducting research at the western edges of Alberta.

"We identified about 15 years ago that the university hydrology research needed to focus on the source waters of the waters that sustain the province," Pomeroy said, noting Saskatchewan's economy and the livelihood of all its residents is connected to the province's waters.

The Global Water Futures program, funded through the Canada First Research Excellence Fund, awarded the water research program at the U of S $77.8 million – the largest grant ever given to the university, and the largest grant for any university water research program in the world.

In the short term, Pomeroy said he hopes the research conducted from the Coldwater Laboratory will help develop new technologies to predict avalanches and floods in the mountain areas. Long-term research will focus more on the Saskatchewan rivers that originate from mountain sources.

U of S expands northern access to engineering programs

Global News - The University of Saskatchewan (U of S) is aiming to improve access to post-secondary science and engineering programs for northern Saskatchewan students.

A program being offered at Northlands College is designed to help the students successfully transition to the university.

The 42-week pre-engineering and science (PRES) program includes high school upgrading, 10 university courses and programming.

Patti McDougall, the vice-provost of teaching and learning at the U of S, said the program recognizes that indigenous people are under-represented in engineering and science.

"It can be quite challenging for people living in northern Saskatchewan to pursue an education in science or engineering, and since 2014 we've been in discussions with Northlands College to figure out how we can help," McDougall said in a release.

"I am proud to say that this new PRES program will provide residents of northern Saskatchewan the chance to locally begin science and engineering programming leading to a range of colleges at the U of S."

McDougall said the program will give support to the students taking math courses and give them a foundation in chemistry and physics.

The first students will start the PRES program in September 2017 in either Buffalo Narrows, Creighton, Île à la Crosse or La Ronge.

Students who choose to attend the U of S will be able to take part in a free two-week transition program in August, which will offer personal support and program-specific information.

New Dean of Engineering at U of S

University of Saskatchewan news release - The University of Saskatchewan has appointed Suzanne Kresta, P.Eng., FEC as dean of the College of Engineering for a five-year term.

Kresta, who is currently a professor in the Department of Chemical and Materials Engineering, and associate dean in the Faculty of Graduate Studies and Research at the University of Alberta, will step into the role effective January 1, 2018.

Kresta is an accomplished researcher in the area of turbulent mixing, who has worked in sectors ranging from drinking water to cosmetics and from hydrometallurgy to oil sands extraction. She is perhaps even more regarded for her teaching excellence, having received the Engineers Canada Medal for Distinction in Engineering Education – the highest engineering education award in Canada – in 2014.

"Teaching is central to our work as scholars," said Kresta, who also received the Award for Excellence in Education from the Association of Professional Engineers and Geoscientists of Alberta. "It is a privilege to educate and train the next generation of Professional Engineers and the high priority the University of Saskatchewan places on learning is one of the things that I value most about the institution."

Kresta replaces Donald Bergstrom, P.Eng., who has served in this role on an interim basis since January 2016. Kresta said she wants to continue to build on the college's proud history to ensure its academic and research programs both continue to meet the expectations of students, government and industry and step out to be a national leader in engineering education and in key strategic research areas.

U of R wins agBOT Challenge for second year running

Regina Leader-Post - For the second year in a row, the Prairie Robotics team has placed first in the agBOT Challenge in Indiana.

The group of four University of Regina engineering graduates competed in the international competition that promotes technology in agriculture.

Last year, the group won the seeding competition. This year, their spraying robot took first place and a $25,000 prize in the weed-and-feed competition on June 25.

"It felt great to win a second year in a row," said Sam Dietrich, though he was surprised at the win for his team, which includes fellow Reginans Joshua Friedrick, Caleb Friedrick and Dean Kertai.

"The level of competition has really increased," said Dietrich, and the other teams "really raised the bar."

Last year's contest saw four ag-bots demonstrating in one event. This year, 17 teams competed between two different competitions.

Another Saskatchewan team, Muchowski Farms from Odessa, placed third in the seeding competition.

Prairie Robotics' project was a sprayer hooked onto a Yamaha ATV. Their bot uses GPS to navigate a field, while cameras provide an up-close view of plants. Their technology can differentiate a crop from a weed and spot-spray accordingly, which would ultimately save farmers money on chemical spray and cause less damage to a field.

The Prairie Robotics team plans to continue working to put its technology into farmers' hands.

INFRASTRUCTURE

CP Rail challenged by K+S infrastructure

Journal of Commerce - K+S Potash Canada's (KSPC) Legacy Project mine site, which opened this month, was no easy task to work on for Canadian Pacific (CP) Railway.

Now named Bethune Mine, it is the first of its kind built in Saskatchewan in more than 40 years. The rail infrastructure built to serve the mine is the most significant engineering project undertaken by CP since the mid-1980s.

"While CP has achieved many great feats in its 136-year history, what we have achieved in close collaboration with K+S Potash Canada is right up there," said Justin Meyer, P.E., CP'S vice-president of engineering.

He said construction of the Belle Plaine subdivision is the largest single rail infrastructure project CP has been involved in since the building of the Mount Macdonald Tunnel in British Columbia in the mid-'80s.

"It wasn't easy and required innovative thinking, hard work and the will to succeed despite all obstacles," he said.

The 30-kilometre route to the mine site was a geotechnical challenge as grading through the valley required the movement of millions of cubic metres of earth. That's equivalent to 1,500 football fields with 1 metre of dirt piled from goal line to goal line.

Adding to the scope of the project was the construction of a 137-metre bridge and 70-metre tunnel.

Crews used 50,000 ties, 4 500 tonnes of steel for plates, rail and bolts and 90,000 tonnes of ballast to complete the project.

CP will primarily use unit trains – trains that consist of only one type of cargo – to ship the potash products to KSPC's handling and storage facility in Port Moody, BC then on to overseas markets. These unit trains will be approximately a mile-and-a-half long, consisting of 177 railcars.

In 2013, CP signed an exclusive long-term contract with KSPC to deliver its potash products safely and efficiently to international markets.

Gardiner anniversary: insert "dam" joke here

Regina Leader-Post - Frankly my dear, it's time to give a dam.

In July, the Gardiner Dam, Saskatchewan's largest piece of infrastructure, celebrated its 50th anniversary.

Located 25 kilometres north of Elbow, the dam was built between 1958 and 1967. Sixty-four metres tall and 5 000 metres long, the dam was officially opened in July of 1967 as part of Canada's centennial celebrations, along with the Qu'Appelle River Dam.

Together the dams created Lake Diefenbaker, a 225-kilometre-long reservoir. The lake serves a multitude of purposes, including power generation, irrigation, recreation, wildlife habitat and flood control. Because the dam supports renewable energy, the province also touts it as a means of helping to reduce SaskPower's greenhouse gas emissions. Some 60 per cent of the population of Saskatchewan depends on the South Saskatchewan River and Lake Diefenbaker for water.

Member Benefits & Affinity Programs

As an APEGS member you are eligible to participate in the member benefit and affinity programs.

Professional Development

Opportunities are offered throughout the year.

- Annual Meeting and Conference in May
- Fall Professional Development Days

University Access

APEGS members are eligible for admission to university classes within their discipline.

- U of R Enrolment Services: 1-800-644-4656
- U of S College of Engineering: 306-966-5273
- U of S College of Arts and Science: 306-966-4231

Library Access

- www.uregina.ca/library, 306-585-4133
- www.library.usask.ca, 306-966-5958 (main)
  306-966-5976 (engineering)

Local Constituent Societies

Constituent societies are groups of engineers or geoscientists who gather together by location or by topic.

APEGS engineering members have automatic membership in their local constituent society. Engineering members are assigned by geographic location, but may request membership in another constituent society.

Active Societies

- Saskatoon Engineering Society
- Regina Engineering Society
- Moose Jaw Engineering Society

APEGS members are eligible for membership in:

- Saskatchewan Geological Society
- Canadian Institute of Mining, Metallurgy and Petroleum
- Saskatoon GeoSection Branch
- Kelsey Chapter of the Association of Professional Engineers and Geoscientists of Manitoba (APEGM)

Affinity Programs

All APEGS members (engineers and geoscientists) and their families can take advantage of the insurance plans, financial and other services through Engineers Canada's sponsored initiatives.

Insurance Plans

- Critical Illness, Disability
- Health and Dental
- Business Overhead
- Pet Health
- Professional Liability
- Term Life and Accident

Financial Services

- Financial Security Program
- Manulife One

Car Rentals

Toll Free 1-877-408-9273

www.engineerscanada.ca/insurance-financial-and-other-benefits

Corporate Rates

APEGS partners with selected suppliers to offer discounts to members on various products and services.

- Hotels
- Insurance
- Rentals
- Travel
- Health and Fitness

roof of membership may be required.

APEGS Services

Numerous services are available and many costs are included in the APEGS membership fee.

Subscription to:

- *The Professional Edge*
- Member On-Line Services
- Volunteer Opportunities
- Annual Salary Survey
- Annual Meeting
- Constituent Societies

www.apegs.ca/Portal/Pages/member-benefits

Calendar Of Events

Conference of Metallurgists 2017 – Hosting World Gold and Nickel-Cobalt
August 27-30, 2017
Vancouver, BC
web.cim.org/com2017

Presentation Skills for Engineers and Geoscientists
September 8, 2017
Webinar
www.apeg.bc.ca/Events/Events/2017/17SEPPP

The Emotionally Intelligent, Highly Effective Engineer and Geoscientist
September 8, 2017
Webinar
www.apeg.bc.ca/Events/Events/2017/17SEPEQI

Durability of Concrete Infrastructure
September 12-13, 2017
Winnipeg, MB
simtrec.ca/event-registration

Future Of Work
September 13, 2017
Calgary, AB
www.apega.ca/members/events/foundations-of-career-branding

Design Week
September 23-29, 2017
Regina and Saskatoon
designcouncil.sk.ca/

Maintenance, Engineering and Reliability / Mine Operators Conference
September 24-26, 2017
Saskatoon, SK
memo2017.cim.org

2017 Canadian Utilities & Critical Infrastructure Information & Communications Technology Conference
September 26- 28, 2017
Regina, SK
utc.org/canada/canadian-utility-telecom-conference

NAFTA Requirement for Working in the United States
September 27, 2017
Vancouver, BC
www.apeg.bc.ca/Events

Engineering Better Team Member Performance with Coaching
September 29, 2017
Vancouver, BC
www.apeg.bc.ca/Events

APEGS Fall PD Days
October 16-17, 2017
Regina, SK
www.apegs.ca

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