



A P E G S

*Association of Professional Engineers
& Geoscientists of Saskatchewan*

THE PROFESSIONAL

EDGE

ISSUE 188 • SEPTEMBER/OCTOBER 2020



Collaboration of Engineers and Geoscientists



Just the *facts*

about Engineers Canada-sponsored
Critical Illness Insurance

Maybe you can relate to Jen,* P.Eng., 2007. She's an established civil engineer, loves her job, loves her two children, and she and her partner are grateful for their health.

Or **maybe you can relate to Matthew,*** P.Eng., 1996. He's an established chemical engineer, loves his job, loves his daughter, and he's grateful for his recovery from a stroke. Unfortunately, his wife was recently diagnosed with breast cancer.

Matthew and his family have had a tough time, while Jen and her family have been lucky. But that doesn't mean Jen's family is immune to critical illness – which is why **it's important to be prepared.**

||| Manulife

1 Canadian Cancer Society, "Nearly 1 in 2 Canadians expected to get cancer: report," June 20, 2017.
 2 Heart & Stroke, "Stroke Report 2016 just released!," June 9, 2016.
 3 ctvnews.ca, "The Health of Canadians: Looking back at 60 years of heart health," February 3, 2015.
 4 Net 5-year survival rate.
 5 Survival rate for those who have a heart attack and get to a hospital. Heart & Stroke, "Getting to the Heart of the Matter," 2015. 6 Heart & Stroke, "The Heart & Stroke 2017 Stroke Report," July 19, 2017.
 7 TheRecord.com, "Cancer patients face high out of pocket expenses," April 15, 2017.

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✔ Critical Illness is all too common.

The statistics relating to critical conditions are eye-opening:



1 in 2

Canadians will develop cancer.¹



1 in 3

Canadians will develop stroke, dementia, or both.²



1 in 2

Canadians will be impacted by heart disease.³

✔ More people are surviving critical illness

Certainly, the good news is that, despite the fact that facing a critical illness can be frightening, **more and more people are surviving** these days thanks to medical breakthroughs. Consider these numbers:

| | Cancer | Heart attack | Stroke |
|---------------|------------------|------------------|------------------|
| Survival rate | 60% ⁴ | 95% ⁵ | 80% ⁶ |

✔ But what about the financial cost?

Survival is priceless. However, **many cancer patients spend over \$20,000** on various costs during their treatment.⁷ And consider the lost wages suffered by the more than 400,000 Canadians who live with long-term disability due to stroke.⁶

✔ Critical Illness Insurance can help

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Taylor Weichel - Administrative Assistant
Fan Yang - Administrative Assistant

Editorial provided by:

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

Editor:

Craig Slater, Managing Director, Martin Charlton Communications
E: craig@martincharlton.ca

Design and Layout:

Jo Anne Lauder Publishing & Design, T: (306) 522-8461, E: joanne.lauder@sasktel.net

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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: 1- (800) 500-9547
E: apegs@apegs.ca

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President's Message



Andrew R. Lockwood, P.Eng., FEC

I sit here, yet again, at my kitchen table, formulating my third president's message about two of my top three* favourite professions.

This edition celebrates the cool kids embracing their geeky cousins (you decide) and making the province all the better for it. That's right, it is the geoscientist and engineer collab ** *Professional Edge* edition.

Looking over the articles, I cannot help but smile with a little pride at my industry and our province punching well above its weight class on the world stage. We are featuring Mosaic and its Belle Plaine solution mine, a prime example of engineers and geoscientists relying on each other's expertise to overcome a technical challenge.

The professionals work together to minimize the surface disturbance and potential environmental impact, while effectively mitigating the risk of potentially catastrophic tailings breaches.

The modern technical solutions developed by our license holders reinforces the social and environmental value APEGS, as a self-regulating profession, provides on behalf of the people of Saskatchewan.

Mining doesn't have exclusive rights over engineers and geoscientists solving cutting edge environmental challenges. APEGS members are working with Leduc and the University of Calgary to develop a triple-threat landfill technology to divert organics, reuse previous landfill material and reduce emissions.

How does it work? As far as my mechanical mind can tell, the secret is a cool technical name (evapotranspiration landfill biocovers) converted into an excellent acronym (ETLBC***). I assume everything else is just window dressing after that, but I suggest you read the article to make up your own mind.

I want to take the last paragraph to highlight the great work by our members, this time related to our governance changes. You can read more about our multi-discipline team developing the implementation plans necessary to allow our organization to adopt modern governance best practices.

This will hopefully make our operations run even smoother, delivering consistent, fair, transparent and ethical **** regulation over the practices of professional engineering and geoscience in Saskatchewan.

* My Friday morning cinnamon bun restauranteur will always be my #1. Sorry, APEGS.

** Collab is me grasping at youthful slang.

*** They may have just had a nice egg-tomato-lettuce-bacon-cheese sandwich and named it after that.

**** Speaking of ethics, check out the new one-hour CPD ethics course online, free for members: <https://apegs.vocalmeet.com/home/>



Mosaic Solution Mining

BY MARTIN CHARLTON COMMUNICATIONS

Trust is a critical element in any relationship. Without it, the relationship will lack stability and limit success, even in the mining world.

At the Mosaic Company's Belle Plaine potash facility, a team of engineers and geologists, operators and drillers work in unison and rely on each other's experiences and expertise in an effort to produce a world-class white potash product that is used as fertilizer for growing healthy plants and in industrial settings.

“We know that we can't operate in silos because not one person has all of the information he or she needs to run a successful operation,” explained Sheldon Rinas, P.Eng., senior mine manager at Mosaic's Belle Plaine site.

Photo: Mosaic Company's Belle Plaine potash solution mine is the largest in the world.

“We rely on our operators to operate the mining area and refinery. We rely on the loggers to give us information so we can effectively mine our caverns. We rely on drilling rigs and other specialty pieces of process equipment,” says Rinas.

“Engineers and geologists have to rely on each other because one person's decision affects another person's area. Everything we do here is interconnected. You have to have really great relationships and collectively work as a team. That is what makes us successful.”

The Belle Plaine site is unique in that it was the first potash solution mine in the world and today remains the largest potash solution mine globally.

Potash is extracted from underground deposits using either conventional mining machines or solution mining, depending on the depth of the resource (in addition to other factors). To mine at depths greater than 1,200 metres, it is safer and more economical to solution mine.

In this technique, warm water is pumped down wells into the potash formation. The potash is dissolved deep underground and the resulting solution is pumped to the plant on the surface where the potash is removed.



Large amounts of water are removed from the solution using evaporators. As the water evaporates, the salt crystallizes first before the potash. Once the salt has crystallized, the remaining potash rich solution goes through the process of crystallizing the potash mineral sylvite.

Another method of recovering the potash is through cooling ponds. The warm brine solution flows into outdoor ponds. As the solution cools, potash crystallizes and sinks to the pond floor. A dredge then is used to collect the crystals and pump them in a slurry to the plant where it will be separated.

“With a solution mine, we don’t have opportunity to visually inspect the mined area,” said Monica Tochor, P.Geo., senior production geologist with The Mosaic Company. “We make decisions using different data and engineering experience. We rely on each other’s expertise to make good business decisions. It’s certainly different than other geological work I have done, but I thrive in the collaborative environment.”

As is the case with most processes, a plan needs to be put in place before any action can occur. Engineers are responsible for developing the mining plan and project management. They’ll collaborate with Tochor and other geologists to determine optimum drilling locations and where best to maximize the resources in the most efficient way.

That collaboration is key because if minerals are missed, depending on what the geology looks like, they may be left irrecoverable. Both Rinas and Tochor said it’s important to plan drilling patterns efficiently the first time, which requires constant communications between the two disciplines.

“If engineers and geologists aren’t working together,

there are increased risks of setbacks during drilling, challenges developing caverns, and the potential for decreased yields from the geological resource,” Rinas said.

“The collaboration that does or does not happen between us (engineers and geologists) in the first step affects everything downstream and affects the rest of the team as well as the overall operation. Eventually our product volume or quality could be impacted. You may not realize how far-reaching some of those decisions can be if you’re not working together.”

“We also have to make sure we consult with our geology department and obtain feedback from our team to understand what is possible for the service rig. You don’t want to drill a well that the service rig can’t maintain.”

As part of the planning stages, geologists identify what is mineable. They’ll look at what information is there to continually refine their understanding of the ore bodies and ensure they have the best game plan for responsibly extracting that resource in an economical way.

Geologists spend a lot of time revisiting historical data, refining their interpretation of new data and putting that back to the mine area for planning. They’ll keep in touch with the team in the mine area and the data collection group to make sure everyone has the most recent information.

Teaching Opportunity

There’s also a teaching opportunity involved. Geologists utilize the core samples as part of the training materials so engineers can look at rock samples that were collected and see the geology.

“This is an opportunity to see the quality of the rocks so they can understand how they deploy their engineering strategies to recover the ore,” Tochor said.

In a conventional mine, engineers will actually get to see what they are mining. With solution mining, they only see the product.

The inability to see the rocks beforehand and what is being mined is one of the major challenges in solution mining. That’s where both geologists and engineers will lean on the advancements in technologies.

“We’re sending down fluids, but we don’t really see the process. Remote sensing is a big part of what we do,” Tochor said. “That’s where innovation and how we use the

new science and new technology all feed back into our efficiencies. In an underground mine, you have information immediately. At Mosaic's Belle Plaine facility, there is a lot of interpretive information from different data collected."

Rinas agreed.

"When you're first to develop something, you can have all of the best-laid plans. But when you actually get to executing that's when you find out whether you were right and what's actually going to happen versus what you thought was going to happen," he said. "We have learned a lot through trial and error. We have also been relying a lot more on the technology, much of which has been developed ourselves."

It's only after the process has been completed do both engineers and geologists have the opportunity to understand the impacts of their work.

Geologists can analyze any problems that happen in the mining area or during drilling. Tochor said she is able to categorize those issues and look for patterns and predictabilities so they can anticipate similar situations before they're encountered again.

Engineers also review their work to learn where efficiencies can be added or processes modified. For example, analyzing equipment maintenance data, refinery operational data or experiences in particular drilling locations.

All information collected is analyzed and shared with other disciplines. It's just another example of the collaboration of teams that takes place at Mosaic's Belle Plaine solution facility.



The Belle Plaine site produces a world-class white potash product that is used as fertilizer.



Treasure from Trash: Landfill Biocovers

BY MARTIN CHARLTON COMMUNICATIONS



Evapotranspiration landfill biocovers are a potentially more efficient and effective method to reduce greenhouse gas emissions from landfills.

You know what they say about one man's trash. It can be another's treasure.

Should Tetra Tech Canada Inc. continue to experience success with its evapotranspiration landfill biocovers, that treasure could be shared globally in the form of greenhouse gas reduction.

Municipal landfills are notorious sources of greenhouse gas emissions. Canadian landfills account for 20 per cent of national methane emissions, with Alberta and Saskatchewan sitting comfortably among the top five provinces with the highest emissions.

In the U.S., landfills are the single largest man-made source of methane gas. Methane is approximately 25 times more effective at trapping heat in the atmosphere than the most prevalent greenhouse gas.

Tetra Tech Canada Inc. has a solution - evapotranspiration landfill biocovers (ETLBC). This is a potentially more efficient and effective method to reduce greenhouse gas emissions from landfills while meeting the requirements for alternative landfill cover.

Current practice in the waste industry is to use a standard final cover when airspace has been fully depleted in a landfill cell. This entails a three-layered approach that includes a clay barrier, a subsoil layer and a topsoil layer. Vegetation is the final layer added on top.

These cover systems act as a barrier to water infiltration, isolate underlying waste and meet regulatory requirements. For landfills that are large enough, landfill gas infrastructure is economically justified. However, the majority of landfills on the Canadian prairies are too small to justify the capital expenditure for an active landfill gas collection system.

“The evapotranspiration landfill biocover acts more like a sponge rather than a barrier,” explained Jerad Bech, P.Eng., project engineer at Tetra Tech Canada in Edmonton. “The premise is to hold on to the water and then release it over time rather than trying to create a succinct barrier between the climate and the waste.”

The standard cover acts as a barrier. Its goal is to prevent the infiltration of precipitation like rainfall or snowmelt. It works behind the premise of a clay barrier. Basically, the cover is designed to stop the water from migrating from the surface through the clay and into the underlying waste.

An ETLBC differs from a standard cover system by using landfill biocover technology to oxidize methane generated from waste degradation to allow for the creation of greenhouse gas offset credits.

Tetra Tech Canada used the Leduc Regional Landfill for a demonstration project. This was a team effort. Tetra Tech worked in conjunction with project partners, the Leduc and District Regional Waste Management Authority and the University of Calgary. Grant funding was provided by Emissions Reductions Alberta.

Of course, the inclusion of soils and topography required the expertise of geologists, who collaborated with Bech and Jeroen Pieterse, P.Eng, project manager at Tetra Tech Canada in Calgary. Hydrogeologists examined the modelling of layers and geophysical engineers provided insight on the slope stability.

“The engineering aspect with this project comes into play with the design of the covers,” Pieterse explained. “If you go with a standard traditional cover, you still need some design work. The landfills give you the requirements like the thickness of the clay and soil layers ... basically, it comes down to finding the right soil, testing it and implementing it correctly.”

Having a variety of disciplines and background working together is nothing new for Tetra Tech Canada.

“Finding the right kind of soils that can be used, we had to find a lab that could do the testing. The key design work is around the kind of soil you have, what thickness you need to ensure your sponge is going to be thick enough. You can’t just say it needs to be a certain dimension. You actually have to do that engineering work of finding and testing the right soils and doing the calculations to find the right thickness,” says Pieterse. And, of course, we worked with others to find the right vegetation ... what is typical for the area and the vegetation that can suck enough water out but also doesn’t have roots that extend too far down.”



Canadian landfills account for 22 per cent of national methane emissions.



Collaboration on projects is embraced and welcomed.

“If anything, as soon as I come across something that is outside of my wheelhouse, I prefer to have the access or the ability to talk to someone who really knows their stuff about the particular subject. Otherwise, you end up making things up,” Pieterse said.

“There are things you can look up online, but that doesn’t necessarily mean you understand it in the right context. You could apply something incorrectly.”

“Any time you’re working with people with further expertise in fields that we’re just scratching the surface on, it’s great to not be the smartest person in the room, especially in the context of this project,” Bech added.

“The amount of learning from others who can offer perspective on things that we didn’t see or didn’t consider was so great.”

With this being a demonstration project, the team had to provide considerable proof to the regulator (Alberta Environment and Parks) that the system could work as well or better than the standard cover. A rigorous design exercise included the construction of test plots at the Leduc landfill site.

The team built 30-metre by 30-metre demos of the technology and within them installed a sensor system to compare the ETLBC test plots and the already-installed clay cover on site.

The intent of the test plots was to provide data on the effectiveness of chosen biocover mix design, construction methodology and to measure methane oxidation rates to confirm that ETLBC would work in Alberta’s climate from

both an alternative cover perspective and potential greenhouse gas emissions reductions, specifically:

- Performance equal to or better than a compacted clay cover.
- Methane oxidation rate of 60 per cent.
- Not susceptible to significant depth of frost penetrations.

The results of the demonstration project were promising. The cover performance exceeded the compacted clay cover system; methane oxidation was measured anywhere between 71-97 per cent; depth of frost penetration was estimated to be less than 300 mm.

“One of the larger goals of the project and the reason why we’re receiving grants is because of the potential for the greenhouse gas mitigation from this technology,” Pieterse said.

“Smaller landfills that can’t economically justify a gas extraction and utilization system are going to be candidates to use this technology and potentially generate offset credits.”

The demonstration project successfully received authorization from Alberta Environment and Parks for use of an ETLBC as an alternative cover system.

Alberta’s climate is similar to Saskatchewan’s, meaning an ETLBC could experience the same success in the neighbouring province.

“An ET cover is only going to be effective where your evapotranspiration exceeds your precipitation,” Bech explained. “You’ll see that in an arid or semi-arid climate. The majority of Alberta is semi-arid. It’s a good pre-screen to figure out where you can install these types of cover systems.”

ET covers were tested in B.C. as well. In the B.C. interior where the climate is semi-arid, the covers performed well. However, closer to the coastline where it is much wetter they did not receive the same high grades and the covers quickly reached a saturation point and developed leaks.

Optimized and well-adapted biocovers are relatively less expensive in terms of operation and installation compared to a conventional gas collection system, whose cost can be high compared to the value of the captured fuel.

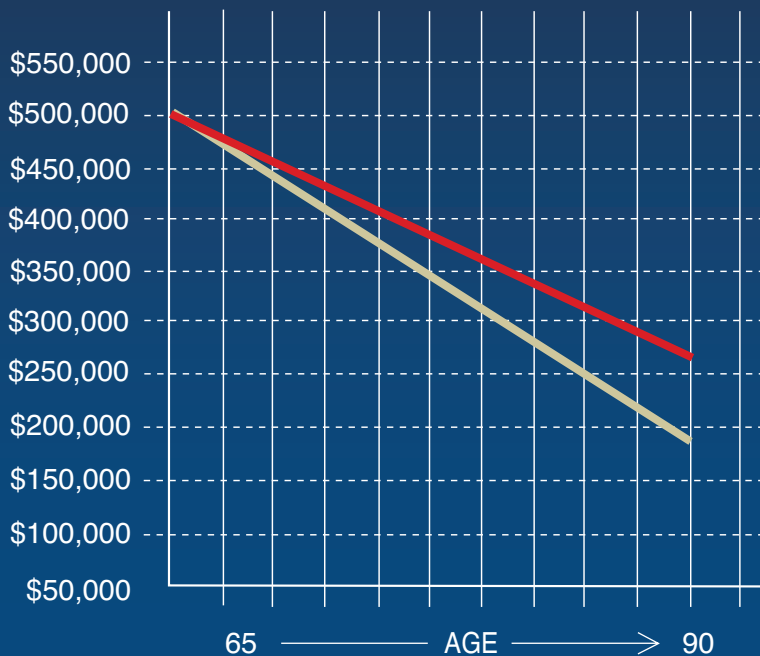
These biocovers have low maintenance requirements and they can be maintained by a relatively untrained person. Thus, they are suitable for both high- and low-income countries.

There have been grants in Saskatchewan as well regarding landfills, specifically for rural municipalities needing to complete expensive environmental assessment studies on their landfill sites. At least 10 studies were conducted throughout the province between 2019-20. Tetra Tech was one of the recommended firms.

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APEGS' Operations During COVID-19



During the COVID-19 pandemic, APEGS is committed to preventing the spread of the COVID-19 virus and to safeguarding the health of the public, applicants, members and staff.

As a result, the following steps continue to be taken:

- The APEGS office remains closed (effective 5 p.m. on March 23, 2020).
- APEGS staff members continue to work remotely. However, a limited number of staff members have returned to the office with appropriate safety protocols as a pilot on September 8, 2020. APEGS will determine a course of action further to this pilot.
- APEGS has cancelled in-person events and will not be organizing in-person events in the foreseeable future. Events are being delivered virtually through Microsoft Teams or by other means.

- Information about events is being provided directly to members and registrants and continues to be available on the APEGS website at www.apegs.ca.
- Regardless of whether staff members are working remotely or at the office, they are responding to email and telephone messages to maintain operations as well as possible under the pandemic circumstances.

Please be aware that there will continue to be delays in responding to inquiries and processing applications. We apologize for the inconvenience and delays during this difficult time and ask for your patience.

Contact information for APEGS continues to be:

Email: apegs@apegs.ca

Tel: (306) 525-9547

Toll-free: 1-800-500-9547 (Canada and USA)

APEGS' highest priority is to safeguard the public as well as applicants, members and staff. APEGS asks all in the Saskatchewan engineering and geoscience community to adhere to government regulations and recommended best practices, such as self-isolation and personal distancing to prevent community transmission of COVID-19.

2021 Membership/License Fees Due on or before December 31, 2020

Renewal notices will be mailed soon



Renewal notices will be sent in mid-November and it is the responsibility of members and the official representative for a Certificate of Authorization to make sure contact information is up to date, including your email address.

If you do not receive your fees notice, contact APEGS. Fees are due on or before December 31, 2020 regardless of problems with delivery.

Check your contact information in your online profile



To check your contact information, log in to your online profile by clicking “Login” in the top right corner on any page of the APEGS website.

If you have never used the system before, click on “Forgot your password” and follow the instructions.

You can also use your profile to make all other fee payments, enter Continuing Professional Development (CPD) credits, renew Permission to Consult, manage your email/mail subscriptions, volunteer for APEGS and change your preferences for receiving information from APEGS.

What happens if I do not renew?



You would no longer have the privilege of practising within Saskatchewan or on properties or facilities located in Saskatchewan.

Use of title in Saskatchewan is also a privilege of membership.

Members who do not retain their membership in APEGS and/or in another Canadian association will lose coverage under the National Secondary Professional Liability Insurance Program.

Also, failure to maintain your membership will result in ineligibility for benefits under the group life insurance program offered through Manulife and Engineers Canada if you have subscribed to this insurance.

What if I am not working in Saskatchewan?



Members who are retired or not working (at anything) in Saskatchewan can retain membership and may be eligible for a waiver of the annual licence fee.

More information can be obtained from the documentation accompanying your fees notice or from the APEGS website under Members, “Annual Fees, Licence Waiver”.

What if my membership ceases and I need to reinstate?



Memberships that have ceased are subject to a 15 per cent fee to reinstate in the same calendar year. Members who notify the APEGS office in writing of their intent to re-sign their membership on or before January 31, 2021 may reinstate their membership

and licence during the calendar year without the payment of a reinstatement or application fee.

The late payment penalty for the holder of a Certificate of Authorization is 15 per cent of the annual fee.

For reinstatement procedures for subsequent calendar years, see the APEGS website under Apply/Reinstatement.

Eligibility for Life Membership



Members who are 65 years of age and retired are eligible to apply for Life Membership. An application comes with your renewal notice in November.

APEGS Governance Change

Further to the last report in the July/August issue of *The Professional Edge*, APEGS has made significant progress with the consultant developing a consistent approach for council to determine whether to implement each of the 33 recommendations.

The approach lays out a plan to examine the feasibility of each recommendation and provides the information council needs to approve, revise or decline a recommendation.

At the September 17 council meeting, council approved the approach and two of the recommendations chosen to pilot

the approach, which are to make the complaint process more transparent by making content more evident on the website and to sunset the Legislative Liaison Committee, transferring responsibilities to staff.

APEGS staff will be busy preparing additional feasibility plans by the end of 2020 for review by the Steering Group and approval by council. In the meantime, committees will continue with regular operations. For any large and longer-term initiatives in 2020, committees will consult with their respective board chair and liaison councillor for direction specific to those initiatives.

Purpose

Examine the recommendations and approve those that will help APEGS improve governance practices and increase focus on APEGS' regulatory objects to:

- Create a modernized structure aligned with regulatory responsibilities.
- Increase role clarity.
- Enhance APEGS' ability to plan and prioritize volunteer and staff activities.

Rationale

Growth in membership.

- A committee structure carried forward from the late 1980s.
- Changes in APEGS' regulatory environment, including removal of the licence for permission to consult, introduction of a required continuing professional development program and introduction of competency-based experience reporting.
- Provincial governments around the country are making or considering significant changes to the legislation for self-regulated professions.

Background

May/June 2019 issue of *The Professional Edge* – APEGS announced the governance review.

Sept/Oct 2019 issue – Staff and volunteers provided the consultant with information and input regarding issues and potential improvements.

May/June 2020 issue – The consultant completed the review and submitted all final recommendations to council.

July/August 2020 issue – Council passed a motion to examine all 33 recommendations, which focus on making changes in practices regarding council size and composition, risk management, public transparency, management of sponsorships, organizational structure, among others.

Next Steps

APEGS will implement the plans for two of the recommendations: to make the complaint process more transparent and to sunset the Legislative Liaison Committee, transferring responsibilities to staff.

APEGS staff will prepare additional feasibility plans by the end of 2020 for review by the steering group and approval by council.

Steering Group

Stormy Holmes, P.Eng., Past President (2019-2020)
Kristen Darr, P.Geo., President-Elect
John Desjarlais, P.Eng., Vice President
Nicholas Kaminski, P.Eng., Council Member
Peter Jackson, P.Eng., Past President (2012-2013)
Bob McDonald, P.Eng., Executive Director and Registrar (Advisor)
Shawna Argue, P.Eng., Director of Registration (Advisor)

Project Director

Tina Maki, P.Eng., Director of Special Projects

Consultants

T. Bakkeli Consultants Inc. and Lana Gray Leadership Services

Questions?

Please relay questions to the steering group through Tina Maki.

Government Programs to Support Businesses during COVID-19 Pandemic

The deadline to apply for the Government of Saskatchewan's Re-Open Saskatchewan Training Subsidy (RSTS) has been extended to December 31, 2020. This program provides a 100-per-cent reimbursement up to \$10,000 for businesses to train employees and support the safe re-opening of businesses in accordance with the Re-Open Saskatchewan Plan.

For more information, visit www.saskatchewan.ca/training-subsidy or contact the Ministry of Immigration and Career Training at cansaskjobgrant@gov.sk.ca.

The Government of Canada offers the Essential Services Contingency Reserve, a program for essential businesses that are having trouble sourcing personal protective equipment for their workers. For more information <https://www.canada.ca/en/public-services-procurement/services/escr.html>.

Tip

Reporting Continuing Professional Development

Sit back and relax

If you have worked full-time since January 1, you have now earned 50 credits for Professional Practice

Spotlight on the Role of Public Appointees

Like all self-regulated professions, APEGS' council includes two public appointees. These members are appointed according to *The Engineering and Geoscience Professions Act* by a Lieutenant Governor Order in Council, upon recommendation of the Minister of Highways and Infrastructure. They are full members of APEGS' council with voice and vote equal to the elected members of council.

The Engineering and Geoscience Professions Act requires that one of these appointees sit on the Investigation Committee and the other on the Discipline Committee. The role of the public appointees is to provide representation of the public in the self-regulation of the professions of engineering and geoscience by bringing an external viewpoint and transparency to the governance and regulation of the professions.

In this article we say farewell to Dwaine Entner, who served as a public appointee from 2013-20. We welcome his replacement, Stu Ritchie, who will join Wendell Patzer, the other public appointee who is currently serving on council.



Dwaine Entner
Public Appointee (outgoing)

What has your experience been like on council?

I have enjoyed working with members of both the Discipline and Investigation committees, as well as council and staff.

What has it meant to you personally to be part of APEGS?

Being a part of APEGS has given me a larger picture of what goes on behind the scenes of how a self-regulated association works and the work involved to accomplish the projects required. I felt my opinion was valued by council and committee members.

Why it is important for a public appointee to be on council?

Representation from the public gives council an opportunity to understand how others not trained in this field approach situations and apply solutions.

As the public appointee who sat on the Investigation Committee as a non-member of APEGS, what is your opinion of how the process is functioning?

We are all provided with the agenda. When we get to the meeting, the information is reported in the same detail. Reports are too lengthy. Meetings are too long. Our staff support does an excellent job. Our legal counsel does an outstanding job keeping us within the law. The committee makes all attempts to deal with complaints in an expeditious manner, but periodically the process is too lengthy.

In general, what is the best attribute of APEGS?

Council works very diligently to protect public safety and enforce the regulations to which members must abide. However, there are too many people on council and everyone wants their opinion heard. Council is moving to examine changes to its size, as part of the work on governance changes", which should help meeting lengths.

I enjoyed my seven and one-half years and wish Council continued success.



Stuart Richie
Public Appointee (incoming)

What is your current employment, background, volunteer work, personal interests, etc.?

I am currently employed at Mosaic Potash at the K3 site. I am a power engineer and water treatment operator with Mosaic. Before this, I worked as a power engineer for 20 years within several industrial sectors. I spent five years as a power engineering instructor and had the opportunity to sit on the pathways to power engineering committee with SaskPower as a representative of the educational institution.

I grew up on a family farm and have a strong mechanical background. Prior to power engineering, I spent 10 years working on the farm while also employed as a mechanic. I have spent time volunteering with Parkland Search and Rescue until we started our family.

My personal interests include golfing, hunting, fishing and farming, as well as spending time with my growing family.

What do you hope to bring to the APEGS Council?

With a background in multiple sectors, I excel at problem solving and coming up with unique solutions to complicated problems. I have a good understanding of various systems and how things operate, which allows me to explain them to others and help prompt decision making.

What are you looking forward to?

I am looking forward to meeting other professionals and networking with industry stakeholders. I am also eager to see and understand the council structure and how the entire process works.

Why it is important for a public appointee to be on council?

Engineers and geoscientists self-govern, which can have a great impact on multiple aspects in the community. It is important that the public's interests are being served and that there is a system of checks and balances to regulate the professions and ensure that members are practicing ethically and competently. A public appointee represents the public to ensure those checks and balances are in place and operating as they should be. I am excited to join this group and learn as I move forward through my term.

Check us out online!

The e-Edge delivers all the content of the print edition to your smartphone, tablet or desktop.



www.apegs.ca/e-edge

Member Profile



Kristl Tipton, P. Geo.

This month *The Professional Edge* chats with ... Kristl Tipton, P. Geo

Tell us about your personal and professional background. Where are you from? Where did you attend university?

I currently live on an acreage near Viscount, Sask., with my husband and two children.

I grew up very close to where we live now - just outside Colonsay.

I moved to Saskatoon where I completed my BSc at the University of Saskatchewan. I spent the majority of my career in the uranium industry with Cameco. This included several years as an exploration geologist in their global exploration group, three years with the Mongolian office, as well as a stint as Senior Mine Geologist at Cigar Lake Mine.

In 2013, in hopes of finding a better work/life balance, I left the job I loved at Cameco to join Mosaic Colonsay as their Management of Change Coordinator in the Continuous Improvement Department (hoping to one day shift to a geological role).

Unfortunately, this move coincided with the downturn in potash and I lost my job.

In 2019, I decided to go back to school and complete an MSc. in Civil Engineering.

I now work at Nutrien Lanigan as the site geologist.

Why did you choose to go into geoscience?

I really didn't choose to go into geology. Out of high school, I was the recipient of a scholarship from Cameco that focused on bringing more women into geological science. After my first year at university, when I actually learned what geology was about, I realized that I truly loved it and decided to stick with it.

Did you have any geoscientists in the family who influenced you?

No, but my dad works as a power engineer at Nutrien Allan operation, so I was somewhat familiar with the industry at the time. I don't honestly think I had any idea what a geologist really was before my first-year geology classes.

What was your first job after university?

I worked as a student with Cameco (as part of the scholarship) and was really lucky to stay on as a junior geologist with them in 2004 when I graduated. As a junior geologist, I was able to experience field camps, drilling campaigns, as well as really exciting geological evaluations of new prospective areas.

What do you feel has been your single greatest accomplishment as geoscientist?

Honestly, my greatest accomplishment is that I am still a geologist. It has been hard. The economy has taken so many great geologists and friends out of the industry. In those six months while I searched for work with no interest in my resume, it was pretty depressing. It was a toss-up when I decided to go back to school. Do I continue to expand on my geological knowledge in hopes of being attractive to a company and upgrade with an M.Sc., or go back to school and change careers entirely?

What is one goal you'd like to accomplish during your career?

Oh, wow, this is a tough one. I really like where I am now. The challenges are just all so new to me. I would love to be part of a team that solves a major problem or comes up with a new application for technology.

What are your interests outside of work? What do you do for fun?

We recently moved to an acreage and are enjoying small town life. I enjoy gardening, camping, fishing, hunting, playing volleyball and hockey.

What is your favourite vacation spot? What makes it special?

Las Vegas, hands down. I guess it is because you can go for a few days and it feels like it was a week. We try to go once a year, take in a show, enjoy the pools and eat at amazing restaurants.

Continuing Professional Development

The Continuing Professional Development (CPD) Program requires APEGS members to complete ongoing professional development activities to maintain and improve their competence. It encourages members to engage in lifelong learning to protect public health, safety and welfare. The program provides tools for members to assess their current skills, knowledge and abilities, determine activities to maintain or enhance them and report completed activities online to APEGS as professional development credits. For more information, navigate to the CPD tab at apegs.ca.

2020 Fall Professional Development Days

Due to the current pandemic, the Professional Development Committee has decided to cancel all in-person courses for the 2020 Fall PD Days. Instead, they will be offering a variety of virtual courses throughout the month of November. For more details and to register visit apegs.ca.

For additional professional development opportunities, please refer to the back cover of this magazine and apegs.ca.

Important Notice – 2020 CPD Variation

As per Section 5.2 of the CPD Program Document, the deadline to apply for a 2020 CPD Variation is September 30, 2020. APEGS will not accept 2020 CPD Variations after this date.

If you will not be able to meet your 2020 CPD requirements and have missed the Variation Application deadline, you must submit a CPD Remediation Plan. For more information regarding the CPD Remediation Program, please refer to Section 6 of the CPD Program Document and the APEGS website.



CPD Tip – How to Calculate and Report Professional Practice Credits

Calculating Professional Practice Credits:

To calculate your professional practice credits:
Every 15 hours of professional practice = 1 CPD credit.

For example: If you worked 2,080 hours in 2020:
 $2,080 \text{ hours} / 15 = 139 \text{ Professional Practice credits}$

Reporting Professional Practice Credits:

You can claim a maximum of 50 Professional Practice credits per year. In the above example, you can report 50 credits online for 2020, bank and track offline the remaining 89 credits and claim them online either in 2021 or 2022.

Online Ethics Module Tip

If you have completed one of the APEGS ethics modules, please remember to download and save a copy of your Certificate of Completion to use as your proof of completion.

Looking for Ethics Training?

Of the many ways to get your annual ethics credit, here are two free online options that APEGS provides to help members who are working remotely:

- Module 1 - Professionalism and Ethics
- Module 2 - Conflict of Interest

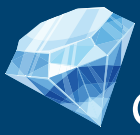
For more information and to access the module, please visit the CPD tab at apegs.ca.

Does Your Next Meeting Need An Ethics Topic?

Starting on September 1, 2020, the Professional Development Committee is offering monthly ethics moments to its members for use in meetings.

When an ethics moment is included in the minutes of a meeting, along with the start and end times of the ethics moment discussion and a record of attendance, this time can count as part of the member's annual ethics requirement.

If you would like this month's ethics moment, please email cpd@apegs.ca.



Gems of Geoscience



Darcy Hirsekorn, P. Geo., is a consulting geoscientist at Uranium Energy Corp. and Uranium Royalty Corp.

The More Things Change, the More Things Stay the Same

Sometimes as a geologist you come across something that strikes home how much and how little the earth has changed over the millions of years it has been in existence.

For me, one of those moments was travelling to the Rudy's Canyon exposure of Thelon Sandstone west of Aberdeen Lake in Nunavut. At the time, I was a junior geologist working for Cameco on its Thelon basin projects.

It was such an exciting time in my career, flying around in helicopters, spending time on the tundra and being introduced to new geology. Even during spring the days were very long and you've never experienced such silence as the tundra on a calm day.

Darcy Hirsekorn, P. Geo., discovered Thelon sandstone in Nunavut while working with Cameco.

The cliffs in the Rudy's Canyon area are comprised of Thelon sandstone and in parts of the exposed rock you can see beautifully preserved ripple marks and large plates of rippled sandstone that have tumbled down from the cliff sides.

I had to take some home. So, I carried a large plate back to the helicopter and then brought them in my bag south to Saskatoon. I still have them today.

The most interesting thing about these ripples is that the Thelon Sandstone is about 1.7 billion years old. The Thelon Basin is part of the Barrenland Group, developed within the continental interior of Laurentia during the late stages of formation of the Paleoproterozoic supercontinent Nuna.

It is an intracratonic basin, remarkably similar in age and geology to the Athabasca Basin that hosts our Saskatchewan uranium mines. At this time in earth's history, there were no plants or animals on the continents. At most, we had algae. So, when these ripples were formed, the area was one wide plain of sand and water.

These ripples would have formed in the same way ripples do today, by the action of waves in shallow water. Despite the fact that it was billions of years in the past when plants didn't exist and the atmosphere had little oxygen, they look nearly identical to the ripples you see in the shallow water at beaches and rivers today.

That is one of the most interesting things about geology. Part of our job as a geoscientist is to look at the geological processes active today and use them to interpret what has happened to rocks long in the past.



Thelon sandstone

Member Grants Available

Through the University of Saskatchewan and the University of Regina, APEGS offers six merit-based grants of \$7,500 each to encourage existing APEGS members to further their education.

Eligibility Requirements

Members returning to post-graduation studies at either university in the field of engineering or geoscience or for an MBA program are eligible to apply. Applicants are evaluated in the following areas:

- Accomplishments in the practice of professional engineering or professional geoscience which indicates exceptional potential.
- Demonstration of leadership, volunteerism and community involvement.
- Service to the professions in public education, understanding the role of professionals in society and/or active participation in engineering/geoscience associations, societies and institutes.
- Reasons for pursuing the post-graduate degree, goals, personal statement and how their studies will contribute to the professions.

How to Apply

Applications may be sent to APEGS any time throughout the year. **Applications received by December 31 of each year are considered and awarded early the following year** with presentations made at APEGS' annual awards banquet, typically in early May of each year.

Go to apegs.ca under Members/Member Grants for the application form and more information.

APEGS Scholarships and Bursaries

Annually, APEGS offers the following scholarships and entrance bursaries awarded at the University of Saskatchewan and University of Regina.

Deadlines to apply vary by university, award type and field. Refer to each university's website for more information.

Scholarships recognizing leadership and volunteerism among university students currently enrolled.

6 SCHOLARSHIPS OF \$2,000
(three for each university) for current students of any field of engineering.

2 SCHOLARSHIPS OF \$2,000
(one for each university) for current students of any field of geoscience.

Scholarships aimed at female university students who are transferring their field of study to engineering or geoscience.

2 SCHOLARSHIPS OF \$3,200
(one for each university) for women in engineering.

2 SCHOLARSHIPS OF \$3,200
(one for each university) for women in geoscience.

Bursaries aimed at encouraging and assisting high school graduates entering the study of engineering or geoscience.

2 BURSARIES OF \$4,000 (one for each university) to be applied towards first-year tuition in any field of engineering for a self-identified Indigenous student.

2 BURSARIES OF \$4,000 (one for each university) to be applied towards first-year tuition in any field of engineering for a student of any background.

2 BURSARIES OF \$3,000 (one for each university) to be applied towards first-year tuition in any field of geoscience for a self-identified Indigenous student.

Calls for Award Nominations

APEGS members do great work that benefits everyone in the province.

Let's celebrate what we do!

The Awards Committee is seeking nominations for the APEGS Awards as well as other provincial and national awards.

If you have a friend, colleague, employee or client who has done something outstanding, this year or over the course of their career, please make sure we hear about it.

You can even nominate yourself!

Our awards recognize both APEGS members and non-members who have made special contributions to the professions.

There are seven APEGS awards:

- Brian Eckel Distinguished Service Award
- Outstanding Achievement Award
- McCannel Award
- Exceptional Engineering/Geoscience Project Award
- Environmental Excellence Award
- Promising Member Award
- Friend of the Professions Service Award

In addition, the Awards Committee nominates APEGS members for awards presented by both Engineers Canada and Geoscientists Canada and numerous other provincial and national awards.

The nomination process is quick and easy!

You can do it online at apegs.ca under Members/APEGS Awards.

You can also send nominations to:

APEGS Awards Committee

Email: apegs@apegs.ca

The due date for nominations for 2021 is **November 30, 2020**.



University of Regina Library Access

BY UNIVERSITY OF REGINA DR. JOHN ARCHER LIBRARY

The University of Regina library is pleased to inform the APEGS community that during this time of COVID-19 we are continuing to provide access to our print collection to APEGS members throughout Saskatchewan.

While we are not open for walk-in service at this time, APEGS members may make requests for books to librarian Charles Phelps charles.phelps@uregina.ca.

Additionally, in lieu of our usual walk-in access to library databases and online journals, we will provide copies of up to five articles per month to members in the Regina area. Contact Charles for copies of articles.

Please note that at times there may be some delay in responding to requests for books or articles.

To see what is available in the library's online and print collections, you can access our Quick Find discovery search engine at <https://www.uregina.ca/library/>.

You may also contact Charles for help in locating information or identifying items.

If you wish to use any of these services and you do not already have a U of R library card, please contact the library via chat, email, or text at <https://www.uregina.ca/library/help/index.html>. You will need to provide your APEGS membership number.

USask Engineering Program/Co-Op Program



UNIVERSITY OF SASKATCHEWAN
College of Engineering
ENGINEERING.USASK.CA

RE-ENGINEERED FROM THE GROUND UP

BY UNIVERSITY OF SASKATCHEWAN COLLEGE OF ENGINEERING

When the University of Saskatchewan (USask) College of Engineering began redesigning its first-year engineering program, everything was on the table. The goal? Create the most effective first-year program in Canada. Dubbed “RE-ENGINEERED,” the program will see its first students in fall 2021.

Why is USask changing how it teaches first-year engineering?

Today’s engineering grads need a more robust and diverse skillset than ever before. But for the most part, engineering education hasn’t fundamentally changed in 100 years or longer, says Associate Professor Sean Maw, P.Eng., one of the leaders of the team transforming USask Engineering’s first-year program.

“We asked ourselves, ‘What if we started from a blank piece of paper? How would we do it?’ ” says Maw, the Jerry G. Huff Chair in Innovative Teaching and a faculty member of the Graham School of Professional Development in the USask College of Engineering.

Along with looking at curriculum, the team focused on better supporting students’ mental and physical health, while keeping them excited about engineering and giving them a solid foundation for their upper-years courses.

As they built the program, designers were informed by extensive consultation with faculty and students, as well as research on effective instruction, principles for teaching and learning in higher education and practices that support student success.

The RE-ENGINEERED curriculum was made possible by Ron and Jane Graham, whose generous donation allowed the hiring of a new team of engineering education specialists to develop the curriculum. As the program is implemented, many alumni continue to support equipment and software costs through gifts to the Engineering Advancement Trust.

How will first-year be structured in RE-ENGINEERED?

Instead of having five or six courses running the length of the semester, RE-ENGINEERED classes will vary in length and intensity, with material sequenced so students will learn knowledge in a course and immediately apply it in another. “Think of TV shows that have crossovers. It’s going to be like that with the courses,” says Maw.

“We will also be pacing things better,” he adds, noting that the team of first-year instructors will communicate regularly and coordinate assessments so students won’t be overloaded one week and have nothing due the next.

In another significant change, first-year students will have a consistent schedule with a common lunch hour so it’s easier for them to schedule community-building extra-curriculars and social events, or simply fit in a workout.

“This predictability is good for mature students, people who are working in the evening and for those who have a family,” explains Maw.

Are the courses changing in RE-ENGINEERED?

The first difference is the addition of online Summer Top Up courses, so students can identify and address gaps from their high school classes – including chemistry, math and physics – before starting first-year. In fact, the college rolled out Summer Top Ups this August, a year earlier than planned, because in-person learning ended so abruptly for Grade 12 students.

Thanks to inclusion of shorter courses in RE-ENGINEERED, a broader range of material will be covered – making students more employable after their first year. For example, content covered in students’ first semester will include:

- Introduction to the profession, including professionalism, ethics and some health and safety training.
- Calculus, linear algebra . . . applied to engineering problems.
- Short courses in chemistry, biology, physics and geology and how they relate to engineering.
- Communication (written, oral, interpersonal, multimedia).
- Indigenous cultural foundation.
- Design, drawing and sketching; CAD.
- Computer programming (Python and Matlab).
- Electrical circuits, mechanics.
- One-day labs introducing students to each of the engineering disciplines.

As first year concludes, students will choose their disciplines and will finish the spring term with bridge courses into their

USask Engineering Program/Co-Op Program



Sean Maw, P.Eng. on campus

chosen major, providing an opportunity to get students excited about their discipline and top up their knowledge in specific areas – such as Survey Camp for students in civil engineering.

Will this first-year program be easier?

Students won't find the work easier, says Maw, but the environment will be more supportive. Although there are no final exam periods, students will be tested on modules of content throughout their courses using competency-based assessment, something new for Canadian engineering education.

The final exam periods in December and April will be used for discipline-specific hands-on learning.

The idea is to ensure students have a stronger foundation in the basics they'll need for the rest of their degree. For instance, they will need to achieve a mark of at least 70 per cent on material involving facts, concepts, basic computations and procedural steps, as well as basic integrative problems in the course.

There will be no minimum standard for the very advanced material.

"They have to do pretty well on the foundational material. If they don't do well on an early test of a learning outcome, they will get a second or third chance to do better," Maw says.

Overall, it will be a more constructive environment for learning.

"We want to minimize the academic attrition by supporting the students better and by coordinating what we're doing across the courses better. It won't be easier, but it will be more supportive and thorough," says Maw.

And it will also ensure students have the information they need to determine if they're making the right career choice.

"If they know what engineering is about and they know what the related sciences are about earlier, they can make a better decision earlier whether engineering is for them."

The overall result will be a stronger crop of USask Engineering grads.

USask Engineering welcoming employers to its Co-op Internship Program

The University of Saskatchewan College of Engineering is ready to welcome employers to its recently launched Co-op Internship Program.

The Co-op Internship Program is similar to the college's past Professional Internship Program – but now employers may offer four-month work terms (May start only), in addition to eight-, 12- and 16-month terms.

The college has students ready to begin work terms in January 2021; employers who are interested in hiring should contact the program – see details below.

Students may also begin work terms in May or September and, in a change from the old program, may do a work term after their second year and may do more than one term during their degree.

Before starting their work terms, students will take a prep course at the college that helps them learn how to effectively network with other professionals. It also enhances their skills in communication and professionalism. They also learn about the importance of reflecting on their work and how that can help them continue to grow and develop as young engineers.

During their co-op internships, students are supported by a workplace supervisor. They are also assigned a mentor through the College of Engineering who provides guidance through formal and informal conversations.

Interested in employing or mentoring an engineering student from USask Engineering's Co-op Internship Program? Please contact Kristen Cutting, Co-op and Career Coordinator, or Tracy McArthur, Co-op Coordinator, at engineering.coop@usask.ca.

You can also visit:

engineering.usask.ca/co-op

Government's Report on Climate Resilience

The Government of Saskatchewan released its second annual climate resilience report in June 2020 with a suite of measures that demonstrate how resilient the province is to a changing climate. They were introduced in the first resilience report released in April 2019 and focus on the principles of readiness and resilience to:

- support the province and its people,
- reduce greenhouse gas (GHG) emissions,
- prepare for changing conditions – such as extreme weather, drought or wildfire.

The report provides a summary of 25 resilience measures with targets, current status and trends to increase resilience in the key areas of natural systems, physical infrastructure, economic sustainability, community preparedness and human well-being.

The number of measures in 'good' status sits at 18 (72 per cent). Some of the highlights in the report include:

- In 2019, the province added approximately 700,000 hectares of protected areas, increasing Saskatchewan's total protected areas to 6.4 million hectares. This covers 10 per cent of the total land base and includes representation from each of the 11 eco-regions.

- Since April 2019, all forest harvest designs in Saskatchewan incorporate natural disturbance patterns.
- In the past two fiscal years, an additional 81 culverts were upgraded/replaced to meet the new provincial flood standard. This helps ensure the province's transportation network is more resilient to extreme weather events.
- The energy consumption in our provincial government-owned buildings continued to decrease, as a result of increasing operational efficiency. In both 2018 and 2019, Saskatchewan surpassed its reduction target.
- In 2019, Saskatchewan continued to increase the area of Crown land with wildfire fuel management work. This reduces the risk of wildfire to northern communities. Completion of wildfire fuel management for the remaining areas is expected by 2028, earlier than the original target of 2030.

The province will continue to track and report on the climate resilience measures to help identify areas of further focus and improvement and to better understand Saskatchewan's resilience to climate change.

More information is available at www.saskatchewan.ca/climate-change.

Celebrating Our Own



Sean Maw, P.Eng.

Sean Maw has been teaching at the University of Saskatchewan since July 2014. Prior to joining the staff at USask, Maw was an associate professor and engineering instructor at Mount Royal University. He obtained a Master's degree in Systems Design Engineering from the University Waterloo before he earned his PhD in Neuroscience from the University of Alberta.

Prof receives national recognition for contributions to engineering education

Professor Sean Maw, P.Eng., is among the inaugural class of fellows of the Canadian Engineering Education Association/Association Canadienne de L'Education en Genie (CEEA-ACEG).

The honour recognizes noteworthy service to engineering education, engineering leadership, or engineering design education.

Maw is a key member of the University of Saskatchewan College of Engineering team developing a brand new, first-year engineering program for the college.

When it launches in fall 2021, the first year will feature a new structure with shorter, more intensive classes, a broader curriculum and a new assessment philosophy – all with the goal of better preparing students for their upper years in the program and their engineering careers.

Maw also helped lead the development of Truss VR, virtual reality software that helps USask Engineering students better learn how trusses work.

His contributions to the CEEA-ACEG include organizing and presenting at events; he also served two years on its national board.

Something worthy of acknowledgment?



The January-February issue of *The Professional Edge* is all about you!

Our annual Profiles in Achievement issue will profile Saskatchewan-based engineering and geoscience companies and projects.

If you want your company or project profiled or would like to recommend one, let us know.

Please contact: Sheena August, APEGS Manager of Communications: saugust@apegs.ca.

News Beyond Our Borders



Miner focused on sustainable nickel

Bloomberg News - A tiny Canadian company is taking Elon Musk up on his offer to efficiently mine nickel, betting it can be done carbon free.

Toronto-based Canada Nickel Co. said it's looking into building a facility that will process zero-carbon nickel just days after the Tesla Inc. boss pledged a "giant" contract to miners that produce the critical battery metal in an "environmentally sensitive" manner.

"The electric vehicle chain and broader market in general is crying out for zero-carbon product," Canada Nickel Chief Executive Officer Mark Selby said.

The estimated US\$1 billion facility would be developed in the Timmins-Cochrane region of northern Ontario, exploiting its proximity to hydroelectric power to reduce emissions. The company is also exploring using serpentine rock, which naturally absorbs carbon dioxide when exposed to air.

Mining companies are under increased scrutiny to employ environmentally friendly practices. Nickel is a key component for the cathodes of electric-vehicle batteries and could face a shortage as soon as 2023.

Oil slump leads to third cut in drilling forecast

The Canadian Press - The Petroleum Services Association of Canada (PSAC) is cutting its 2020 Canadian drilling forecast for a third time as the industry remains mired in a slump expected to extend well into the second half of the year.

The association says it now expects just 2,800 wells will be drilled in Canada this year, down from a nearly 50-year low of 3,100 in its revised forecast in April.

The new forecast for 2020 is 43 per cent lower than the 4,900 wells drilled in 2019.

PSAC interim CEO Elizabeth Aquin says a slow economic recovery, low commodity prices and high debt levels in the industry are preventing a quick recovery from the lows of earlier this year amid an economic downturn caused by the COVID-19 pandemic.

She says a surplus of North American crude oil means producers have little incentive to explore for and develop new wells.

Last week, Calgary-based Precision Drilling Corp. reported more layoffs and parked drilling rigs as revenue, led by lower activity in its Canadian and U.S. operations, fell by 47 per cent in the second quarter compared to the same period of last year.

Alberta powers up hydrogen sector

Financial Post - Alberta took tentative steps in sourcing energy from hydrogen with a string of new small-scale projects to develop a market in the province for the nascent and alternative energy source.

The funding is part of a wider plan to reduce the province's large carbon footprint that includes investments in 20 emissions reductions projects that would receive a total of \$58 million in funding through Emissions Reduction Alberta with the goal of driving down carbon emissions in the province by one million tonnes by 2030, equivalent to taking 750,000 cars off the road.

Hydrogen emits only water vapour when combusted and is gaining traction around the world as economies look to reduce emissions.

The three hydrogen projects will focus on a prototype and field-testing of a new method of extracting hydrogen from natural gas; on the development of a new early-stage technology to use heat to crack methane into hydrogen and other byproducts.

In addition, Calgary-based utility and holding company ATCO Ltd. will work on a project to be built in 2021 that will blend hydrogen into natural gas streams distributed for home heating in Fort Saskatchewan.

By blending the available hydrogen into ATCO's natural gas distribution system in the area, the hydrogen molecules can go a long way in reducing emissions. The plan is to blend ATCO's natural gas stream in the Fort Saskatchewan area with five per cent hydrogen to start with, but there is potential to expand that to between 20 per cent and 40 per cent.

Engineer grads among top earners

Statistics Canada - The COVID-19 lockdown resulted in record youth unemployment rates, which could adversely affect postsecondary graduates for years to come.

Three new studies shed light on this issue. They provide a snapshot of the labour market success of bachelor's, master's and doctoral graduates from detailed programs.

In total, these gender-based studies include results for men in 118 bachelor's degree programs and women in 123 programs; men in 77 master's degree programs and women in 95 programs; and men in 29 doctoral degree programs and women in 22 programs.

The studies reveal that most top earners among bachelor's degree graduates came from various engineering specialties. Six of the top 10 disciplines among men and seven of the top 10 disciplines among women were in engineering.

Mining and mineral engineering graduates ranked first among men with \$111,533 in median earnings five years after graduation and second among women with \$89,680. Their counterparts that graduated from chemical engineering also ranked high, landing fifth among male graduates (\$89,637) and third among female graduates (\$82,193).

In contrast to their counterparts with a bachelor's degree, individuals with a master's degree in engineering specialties often registered median earnings that were below the overall median for all master's degree graduates.



STEM kit helps First Nations youth

Fort McMurray Today - First Nations youth in the region have been continuing STEM (science, technology, engineering, arts and math) learning outside the classroom after Actua delivered dozens of at-home learning kits earlier this summer.

The kits include activity books, worksheets and innovative challenges that can be worked on independently.

Doug Dokis, Actua's director of national Indigenous youth in STEM, said the kits help the youth who are out of school build skills and confidence while keeping them physically and intellectually engaged.

The kits include a variety of activities, including online

coding, water monitoring, growing plants and making musical instruments. There is also an activity that involved mapping the community and seeing how STEM has always been in the community such as through water systems and culture systems.

Dokis said they put a focus on local and Indigenous knowledge.

The kits were delivered to the communities by Indigenous undergrad students. Dokis said this allows the youth to see themselves in careers such as engineers or scientists.



Engineer hopes to bridge the cultural gap between Indigenous people and energy projects

Northern Ontario Business - An aspiring Indigenous leader from northeastern Ontario is ready to make her voice heard in a national forum.

Kaella-Marie Earle, an engineer-in-training with Enbridge Gas and member of Wiikwemkoong Unceded Territory on Manitoulin Island, is taking a seat with the Indigenous Advisory Committee of the Canada Energy Regulator (CER).

The CER formed in August 2019 to replace the former National Energy Board, the federal regulator of pipelines, power lines and imports and exports of energy products. The updated mandate of the Crown organization is to transition Canada to a low-carbon economy and bring about greater participation for Indigenous people in the energy sector.

Earle is one of eight people recently named to the newly formed committee. She is a Laurentian University engineering graduate and who works as a construction project manager for Enbridge Gas in the Chatham-Kent area of southwestern Ontario.

Committee members are drawn from First Nation communities and organizations across Canada, each representing a diverse range of knowledge and unique perspectives of the industry.

The committee won't be making decisions on specific energy projects but will assist the CER's board of directors on strategy issues.

One idea Earle wants to bring forward is the creation of a

collaborative database for industry to better consult with First Nations on energy projects.

Such a database, she believes, would serve as a critical cultural bridge to help steer the consultation process, provide meaningful engagement, deliver palatable project information to the communities, save companies money and provide down-the-road project procurement opportunities for communities.



Energy megaprojects employing thousands in B.C.

Alaska Highway News - While the big energy story of 2022 will likely be the completion of the \$12.6-billion Trans Mountain pipeline expansion, B.C.'s economy will also be benefitting from the construction of three other energy megaprojects – the \$17-billion LNG Canada plant in Kitimat, the associated \$6.6-billion Coastal GasLink pipeline and the \$10.7-billion Site C dam.

By 2022, BC Hydro also hopes to have completed the \$280-million Peace River Electricity Supply project – construction of which is underway – that will link the LNG Canada and Site C dam projects by providing clean power to natural gas producers supplying the new liquefied natural gas plant in Kitimat. The idea there is to lower the greenhouse gas emissions intensity of LNG produced in B.C. by electrifying the upstream.

These big energy projects are already employing thousands of workers. There are about 1,600 people employed in Kitimat at the LNG Canada project. The workforce is expected to peak at about 4,500 throughout 2022 and 2023.

Close to 600 workers are employed on the associated Coastal GasLink pipeline, which is expected to have peak employment of 2,500, with completion slated for 2023.

Meanwhile, Site C dam employs more than 3,200 workers, but typical pre-pandemic workforce numbers for the project were around 4,000. It is slated for commissioning in 2024.

The biggest challenge in 2022 may be finding enough qualified workers for all the big projects being built.

LNG Canada, Coastal GasLink and Site C dam alone will employ roughly 11,500 workers at peak construction. BuildForce Canada estimated that 13,000 new jobs would be added in B.C. in 2021, with LNG Canada and Site C dam being major drivers, although it also included projects like the Pattullo Bridge replacement project.



MineWare develops AI-based drill automation platform

Canadian Mining Journal - MineWare, a provider of mining equipment monitoring and automation solutions, developed an industry-first artificial intelligence-based drill automation platform, Phoenix AI, to optimize aftermarket blasthole drill operations.

In autonomous mode, Phoenix determines the design hole depth based on the drill plan and uses AI algorithms to generate and adjust force to match ground conditions. The AI-based decision engine continuously monitors and responds to geologic faults, taking instant action to correct them in a nearly predictive manner as it works to ensure the highest quality blast hole.

According to Curtis Stacy, product manager for Phoenix AI, the interoperable platform features advanced AI to help with common drilling issues and improve performance.

“Compatible with all blasthole drill makes and models, Phoenix AI is an independent system that allows machine operators to automate their entire drill cycle at the push of a single button, without compromising the OEM control system,” Stacy said in a release. “The new layer of technology helps drills work faster and smarter to improve machine performance, hole quality, detect and correct down-the-hole faults, optimize drill and blast outcomes, and drive efficiencies downstream.”

By giving operators the ability to hand more control to the machine, Curtis added that drill and blast teams can eliminate operator variability, one of the major causes of poor hole quality and machine stress.

News From The Field



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ENERGY

Dark predictions come true for solar industry

Regina Leader-Post – It has been eight months since Saskatchewan’s solar companies predicted that a shift away from SaskPower’s previous net metering program would decimate their industry.

Now, some say, those warnings have come true.

Brenden Owens, co-owner of Prairie Sun Solar, said the residential solar market has “fallen off a cliff.” His company had eight staff on board at its peak. Now it’s just him, another owner, and one part-time employee.

He knows of four solar companies that have shut their doors for good.

SaskPower’s own data shows that far fewer homeowners have hooked up solar energy systems since it introduced its “revamped” program, which cut the value of credits customers could earn through excess power they send back into the grid. It offers 7.5 cents per kilowatt hour — the price SaskPower pays for power — instead of the 14-cent retail rate under the previous net metering program.

The provincial government got rid of a rebate for 20 per cent of up to \$20,000 in installation costs at about the same time in the fall.

SaskPower accepted 118 applications since the launch of the new program in November. That’s down sharply from the 721 applications received under the previous program during a comparable period, from November 2018 to June 2019. It’s lower than any year since 2015-16.

City unveils first electric bus

CKOM - Saskatoon Transit will be testing an electric bus over the next year as part of its public transport fleet.

The city says it is hoping the addition of the electric bus will result in lower fuel bills and a reduction of greenhouse gas emissions.

The total cost of the project is estimated to be \$533,600, of which \$234,300 is from the Green Municipal Fund (GMF), a fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities (FCM).

This is a milestone in Saskatoon’s Low Emission Community Plan, which has a goal of the transit fleet being 100 per cent electric by 2030.

The electric bus project’s net carbon emissions reduction is expected to be 50.3 tonnes of CO₂ per bus per year (accounting for the bus and the electrical grid’s emissions-intensity factors) and is expected to save \$27,500 in fuel costs per bus per year.

The city says some of the benefits of the new bus include improved air at bus terminals, less noise pollution along bus routes and lower operation and maintenance costs.

SaskPower plan for more electric vehicles

Global News - With more electric vehicles hitting the streets in Saskatchewan, SaskPower and electric vehicle associations are looking to hear from drivers about their experiences.

The number of electric vehicles is growing every year in the province. However, finding a place to charge can be a challenge.

There are around 50 public charging stations in the province, according to SaskPower.

Over the past decade, the number of registered electric vehicles in Saskatchewan has grown from 28 in 2015 to more than 300 in July 2020, according to SGI.

The survey being conducted by SaskPower, the Saskatchewan Electric Vehicle Association (SEVA) and SaskEV — two electric vehicle associations — will look at things like where people charge their cars, at what times, and whether more stations are needed.

MAYORAL RACE

Engineer running to be next mayor of Saskatoon

Global News - Engineer and business owner Zubair Sheikh, P.Eng., wants to be the next mayor of Saskatoon.

He said the incumbent council and mayor Charlie Clark have cost taxpayers too much money and residents need a break as they struggle to recover from the coronavirus pandemic and subsequent lockdown.

To that end, he's promising better fiscal management and no tax increases for four years if he's elected in the upcoming civic election.

"To be a mayor of a city you have to be a good businessman," he said, touting his experience running his engineering firm, Active Engineers Saskatoon. "If you will think the city is your own business, you will be a good mayor. You don't need to be a politician."

Sheikh's 13-point platform includes policies improving infrastructure "as deemed necessary," eliminating unnecessary spending and attracting year-round tourism by offering tax incentives to construct an indoor theme park.

He also plans to bring in investors to construct charging stations for electric vehicles and for the city to attract offices for companies that refine uranium — an industry that he predicts will expand.

Sheikh said he would continue to support the police budget, \$110.4 million in 2020, and crime reduction initiatives.

But he said the city should not spend close to \$70 million on a new library. He said providing cheaper internet rates to students and their families would have a greater positive impact on their education.

He said all of his programs will be paid for with the current tax rate and by reducing city expenses, but he wouldn't know where to find those savings until he was elected.

MINING

Junior miners ready to pounce

Saskatoon Star Phoenix - Spiking gold prices could send junior miners to the hills in search of the metal.

That's because gold hasn't reached these heights since 2011. After years of hovering at about \$1,300 US an ounce, it climbed to more than \$1,800 US in July. That's left junior miners, who explore and drill holes looking for deposits, primed to move on wealth hidden in the province's north.

"Here we are now in a frenzy. Literally, a frenzy," Warren

Stanyer, P. Geo., CEO of ALX Resources Corp., said. "Junior mining companies are getting millions of dollars from bankers and investors because everyone thinks gold's going to go a lot higher."

He attributes that hike to the uncertainty roiling the economy. Governments issuing more money and entering into more debt, he said, strengthened gold and helped cash flow for firms like his.

ALX Resources has been active. On July 9, it announced it acquired Sceptre Gold Project, which is about 125 kilometres east of La Ronge.

The belief that Saskatchewan gold has gone overlooked is part of that optimism.

"There's certainly no reason to think all the gold has been found," said University of Saskatchewan geology professor Kevin Ansdell, P. Geo., FGC, FECC Hon.

He pointed to SSR Mining Inc.'s Seabee gold mine located approximately 125 kilometres northeast of La Ronge. In 2019, it marked its fourth straight year producing a record amount of the metal.

An issue, though, is that gold deposits in the province are relatively small, Ansdell said. While they can be economically viable, even success stories like Seabee's gold deposit can be small compared to larger deposits around the world.

That may leave room for smaller companies in the province to explore and find deposits, Ansdell said.

"There's good potential, so it'll be interesting to see what happens over the next year or two."



Rare earth processing facility announced

Pipeline News - The Government of Saskatchewan is providing \$31 million in funding for a rare earth processing facility in Saskatchewan.

The processing facility will be owned and operated by the Saskatchewan Research Council (SRC) and will be more than 69,000 square feet. It will be built in Saskatoon.

Premier Scott Moe said the money will be used for the design, construction and commissioning of highly specialized equipment required for the processes.

The premier said it will be the first of its kind in Canada and will begin to establish a rare earth element (REE) supply chain in Saskatchewan, forming an industry model for future commercial REE resource expansion in the province.

Global demand for REEs is expected to increase significantly in the coming decade as demand for electric vehicles, renewable power generation and all forms of electronics increases.

SRC president and CEO Mike Crabtree, P.Eng. said the facility is expected to be fully operational in late 2022 with construction beginning this fall.



Rio Tinto eyes nickel near Stony Rapids

Saskatoon Star Phoenix - One of the world's largest mining conglomerates is set to expand its stake in Saskatchewan.

In late August, Rio Tinto Exploration Canada said it has an agreement with ALX Resources Corp. for the latter's nickel project, about 20 kilometres northwest of Stony Rapids.

In the deal, Rio Tinto may acquire up to an 80 per cent stake in the project. It can do that by spending \$12 million in exploration costs over six years and by making cash payments to ALX totalling \$125,000. ALX Resources currently owns the whole project, while Rio Tinto will act as an operator.

Rio Tinto's decision was an endorsement of the project's potential, ALX Resources CEO Warren Stanyer, P.Geo. said.

"(It's) taking a gamble on nickel in Saskatchewan," Stanyer said. "... These people are mine finders. They really don't like to dabble too much."

However, he added, years of sustained development activity may be necessary before the investment translates into more local employment.

Cameco to reopen Cigar Lake mine in September

CBC Saskatchewan - A major Saskatchewan uranium mine is expected to reopen in September.

Cameco announced it would be reopening its Cigar Lake mine after temporarily closing in March over COVID-19 concerns.

At the beginning of the closure, the uranium mining company said it made the decision after realizing it's

difficult to maintain physical distance at a fly-in mine.

The company expects it will take two weeks to get the mine back into production and will only reopen the mine if it is safe to do so.

Normally, 300 workers are employed at the site.

The Key Lake/McArthur River mine site will remain closed. The site was temporarily shut down in 2018 due to a production curtailment.

OIL AND GAS



Drilling in Sask comes to a halt

Humboldt Journal - Usually, there would be 30 to 50 rigs drilling in Saskatchewan, with most drilling for oil, but a few drilling for potash or helium. Right now, there is only one rig active.

According to Rig Locator, as of late July, that single rig is drilling for helium.

The active drilling rig count is one of the key leading indicators of the health of the oil industry. Rig Locator reports no drilling rigs have been drilling for oil in Saskatchewan since the end of the winter drilling season in mid-March.

Additionally, Saskatchewan's oil production went from 502,700 barrels per day in March 2020, to 361,000 bpd in May, a decline of 28.2 per cent. When oil prices cratered in April, many oil producers shut down substantial portions of their production and all ceased drilling.

The tremendous destruction in demand for oil around the world came with the onset of the COVID-19 crisis which occurred in mid-March. This coincided with Saudi Arabia and Russia flooding the market with additional oil.

In mid-April, West Texas Intermediate (WTI) oil briefly went into negative pricing territory for one day. Since then WTI has come back to US\$40 per barrel, but drilling has not resumed and rigs are parked throughout the province.



SK has right model for orphan wells: CNRL

Financial Post - Alberta should follow Saskatchewan's example in its approach to distributing funds for cleaning up old oil and gas wells, the head of Canada's largest oil and gas producing company said.

"I think what Saskatchewan did better than some of the other provinces is they worked with many of the stakeholders in their design (of a well clean-up program)," Canadian Natural Resources Ltd. president Tim McKay said.

CNRL has been one of the most active companies in the oil patch when it comes to plugging and remediating inactive and uneconomic oil and gas wells.

In the midst of the COVID-19 pandemic, the federal government announced \$1 billion to fund such clean-up efforts in Alberta, British Columbia and Saskatchewan as a way to address an environmental problem and to put unemployed oilfield workers back to work.

The program in Alberta has been criticized because initially its criteria for who would get funding was unclear and the system was swamped with applications, though the province has made adjustments over time.

In Saskatchewan, which is distributing \$400 million in funding to oilfield services companies to clean up wells, CNRL says the program is running smoothly.

The scale of the problem in Saskatchewan is also significantly smaller than it is in Alberta, where over 91,000 inactive oil and gas wells dot the landscape and where there are nearly 3,000 orphan oil and gas wells with no owner responsible for cleaning them up.

UNIVERSITIES

USask engineers to study possible COVID-19 transmission through HVAC systems

CBC Saskatchewan - Engineers at the University of Saskatchewan received a grant to research the effects of smaller particles of the novel coronavirus and possible transmission through HVAC systems.

Carey Simonson, P.Eng., a professor of engineering at the university, is part of the team who were awarded the Natural Sciences and Engineering Research Council (NSERC) grant.

He said while the public is doing its part in preventing the spread of the virus by washing hands and wearing masks, doing so only protects against the bigger particles of COVID-19.

"The individual virus is around 0.1 micrometer, so we think of a human hair [that's] around 100 micrometers, this is a thousand times smaller," Simonson said. "The smaller aerosols that we can't see, they can travel certainly longer distances."

He said COVID-19 particles could be suspended in the air for hours.

"It's enough of a concern that our systems, our HVAC systems, should consider the possible transmission through the ventilation, heating and cooling systems," Simonson said.

He said the main aspect of their study is providing fresh air for spaces and the resulting effect on the smaller particles.

He said they're looking specifically at ventilation and air-to-air energy exchangers, and whether they would bring in some of the contaminants that were sent out of the building back into it.

Simonson said it is a six-month project and there could be more research done with the apparent "new norm" of COVID-19.

CONSTRUCTION

Masonry leading construction in remote Saskatchewan regions

Journal of Commerce - Journal of Commerce - At the end of June, Saskatchewan architect Heney Klypak of Wallace Klypak Architects Ltd. was called to a remote First Nations reserve to examine fire damage in a school's change room caused by an electrical short in a vanity light.

Klypak credits the stringent building standards now in place by Indigenous Services Canada (ISC), which sets out a life expectancy of 60 to 70 years for institutional buildings on First Nations lands. That longevity is best met using masonry.

Saskatchewan retains many older masonry structures built over a century ago.

Sasha Kirin, P.Eng., a civil engineer employed by the Canadian Masonry Design Centre, said the advantage Saskatchewan has is a long history in masonry.

Klypak said masonry structures have provided architects with the ability to provide design features that would be difficult to replicate with other building materials in remote areas.

Calendar Of Events

LEED GREEN Associate (GA) Training - Webinar

October 17, 2020 & October 25, 2020
<https://leadinggreen.com/webinars/>

Sustainability in Practice – Webinar

October 21 – December 12, 2020
<https://catalogue.edulib.org/en/courses/polymtl-sdes101/>

FWRISA Requirements for Foreign Worker Recruiters and Immigration Consultants - Webinar

November 4, 2020
<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

LEED GREEN Associate (GA) Training – Webinar

November 7, 2020
<https://leadinggreen.com/webinars/>

FWRISA Requirements for Employers Wishing to Recruit Foreign Nationals - Webinar

November 18, 2020
<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

LEED GREEN Associate (GA) Training – Webinar

November 19, 2020
<https://leadinggreen.com/webinars/>

APEGS Fall PD Days (Delivered by CTEL) – Webinars

November 10 & 12, 2020 – Understanding Personalities
November 18 & 20, 2020 – Managing Time
November 25 & 27, 2020 – Managing Conflict
December 1 & 3, 2020 – Listening Skills
November 24, 2020 – Mentoring
Details to follow at www.apegas.ca

Professional Practice Exam

November 23 – 25, 2020
<https://www.apegs.ca/Portal/Pages/event-details-7/86741>

Timecards and Records of the Hours Worked – Webinar

December 2, 2020
<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Payroll Records – Webinar

December 16, 2020
<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Overview of Employment Standards – Webinar

January 6, 2021
<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Layoff and Termination – Webinar

January 20, 2021
<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Understanding your Secondary Professional Liability Insurance - Webinar

General information webinar:
<https://www.youtube.com/watch?v=162fCLRU45Y>
Whistleblower webinar:
<https://www.youtube.com/watch?v=EHsyzr3Bw7c>

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