



A P E G S

*Association of Professional Engineers
& Geoscientists of Saskatchewan*

THE PROFESSIONAL

EDGE

ISSUE 189 • NOVEMBER/DECEMBER 2020



Resources & New Energy Development



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.

Manulife, Manulife & Stylized M Design, and Stylized M Design are trademarks of The Manufacturers Life Insurance Company and are used by it, and by its affiliates under license. All rights reserved. © 2020 The Manufacturers Life Insurance Company. All rights reserved. Manulife, P.O. Box 670, Stn Waterloo, ON N2J 4B8.

Accessible formats and communication supports are available upon request. Visit manulife.ca/accessibility for more information.

Underwritten by
The Manufacturers Life Insurance Company

✓ 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

Engineers Canada-sponsored Critical Illness Insurance **pays a lump sum** upon diagnosis of a covered life-threatening condition, to help in any way you choose. You and your spouse may apply for benefit amounts between **\$25,000 and \$1 million**. Choose one of two plans to cover either 6 or 18 conditions.

To learn more and apply:

 manulife.ca/apegsCI

 **1 877 598-2273**





A P E G S

Association of Professional Engineers
& Geoscientists of Saskatchewan

Regulating the professions. Protecting the public.

Professional Edge Committee

Alix Cruickshank, P.Geo. - Liaison councillor
Xiangning (Simon) Li, P.Eng. - Chair
Muhammad Kamran Akhtar, Engineer-in-Training
Georges Belcourt, P.Geo.
Rahul Hampaul, P.Eng.
Mahdi Kowsari, Engineer-in-Training
Sheri Praski, P.Eng., FEC
Jennifer Roste, P.Eng., M.Sc.

Staff Advisor

Sheena August
- Manager of Communications

Staff

Bob McDonald, P.Eng., MBA, LL.B., FEC, FGC (Hon.), FCSSE
- Executive Director and Registrar
Shawna Argue, MBA, P.Eng., FEC, FCSSE, FGC(Hon.)
- Director of Registration
Ferguson Earnshaw, P.Eng.
- Director of Corporate Practice and Compliance
Kate MacLachlan, P.Geo., FGC, FEC (Hon.)
- Director of Academic Review
Tina Maki, P.Eng., FEC, FGC (Hon.)
- Director of Special Projects
Barbara Miller, FEC (Hon.), FGC (Hon.)
- Director of Finance and Operations
Chris Wimmer, P.Eng., FEC
- Director of Professional Standards
Delee Silvius, P.Eng.
- Assistant Director of Registration
Sheena August
- Manager of Communications
Candice Armstrong - Administrative Assistant
Jolene Arthur - Compliance Coordinator
Erin Beare - Academic Review Assistant
Judy Brinkhurst - Senior Administrative Assistant
Alex Chabun - Registration Assistant
Ria Clark - Administrative Assistant
Sharon Evaniew - Executive Assistant
Angela Foster - Registration Coordinator
Jinesh Kamdar - Business Analyst
Anil Varma Keerthipati - Testing Analyst
Carmen Ngui - Academic Review Assistant
Nastacia Noade - File Clerk
Allison Smith - Academic Review Committee Assistant
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:

Martin Charlton Communications
E: craig@martincharlton.ca

Design and Layout:

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

Opinions expressed in signed contributions are those of the individual authors only and the Association accepts no responsibility for them. The Association reserves the right to make the usual editorial changes in content accepted for publication, including such revisions as are necessary to ensure correctness of grammar and spelling. The Association also reserves the right to refuse or withdraw acceptance from or delay publication of any manuscript. SSN 0841-6427

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

Material is Copyright. Articles appearing in *The Professional Edge* may be reprinted, provided the following credit is given: Reprinted from *The Professional Edge* - Association of Professional Engineers and Geoscientists of Saskatchewan, (issue no.), (year).

POSTMASTER

Return undeliverable copies to: *The Professional Edge*,
APEGS, #300 - 4581 Parliament Avenue, Regina SK S4W 0G3

Advertising in The Professional Edge

It pays to advertise in *The Professional Edge*. You reach over 7,000 P.Engs., P.Geos., Engineers-in-Training and Geoscientists-in-Training in Saskatchewan and 7,000 others outside Saskatchewan.

Advertising Rates and Mechanical Requirements

Advertising rate, per dimensions (width x height) insertion. Colour as published.
Electronic art must be at least 300 dpi in a JPEG, TIFF or EPS format.

COVERS		1x	3x	6x
Outside Back:	\$1,500	\$1,500	\$1,250	\$1,100
Inside Front/Back:	\$1,200	\$1,200	\$1,000	\$900

PAGES		1x	3x	6x
Full page	8 x 10 ^{1/2}	\$1,000	\$900	\$825
2/3 page	5 ^{1/4} x 10 ^{1/2}	\$800	\$700	\$625
2/3 page	8 x 7	\$800	\$700	\$625
1/2 page	8 x 5	\$700	\$600	\$525
1/3 page	2 ^{1/2} x 10 ^{1/2}	\$600	\$525	\$450
1/3 page	5 x 5	\$600	\$525	\$450
1/3 page	8 x 3 ^{1/2}	\$600	\$525	\$450
1/6 page	2 ^{1/2} x 5	\$300	\$275	\$250
Bus. Card	3 ^{1/2} x 2	\$150	\$125	\$100

Deadlines:

Issue: January/February 2021
Submit to APEGS by: December 11, 2020
Publication Distributed Week of: February 1, 2021

<https://www.apegs.ca/Portal/Pages/Advertising-Edge>

Subscription Rates:

Members and Licensees - Free. Others in Saskatchewan - \$12/year. Elsewhere - \$20/year.
* Applicable GST/HST will be added to advertising rates.

Table of Contents

ISSUE 189

NOVEMBER/DECEMBER 2020

05 President's Message

18 2021 Membership/License Fees

19 90th Annual Meeting

21 Competency-based Assessment

22 Saskatchewan Geological Society

23 Call for Council Nominations

24 Council Notes

25 Governance change

26 Member Profile

28 Continuing Professional Development

29 Gems of Geoscience

30 Scholarships and bursaries

31 New APEGS Ads

32 Celebrating Our Own

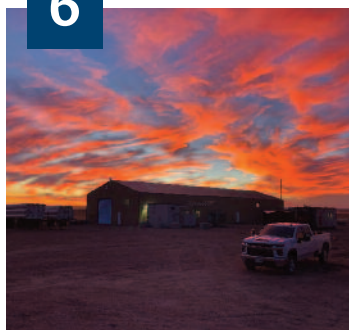
33 News Beyond Our Borders

38 News From The Field

44 Calendar of Events

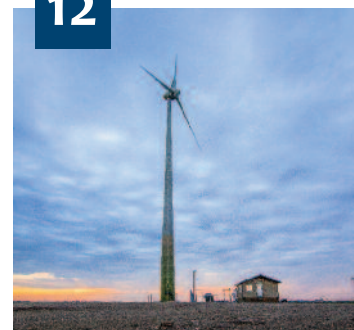
Resources & New Energy Development

6



**Helium exploration
poised to soar**

12



**First Nation creates
carbon-free electricity**

8



**Making a case for
nuclear**

14



**Mother Nature lends a
hand**

10



Rooted in uranium

16



Could lithium be next?

President's Message



Andrew R. Lockwood, P.Eng., FEC

I sit here at my kitchen table, attempting to construct my president's message while directly violating the explicit request of my editor to not include this same line again.

I acknowledge her concern and duly ignore it, unlike the rest of the topics in this month's *Professional Edge*.



We have just come out of a provincial election and a historic election south of the border. The appropriate response to climate change is a key policy topic. One item folks agree on is that greener technology can help lessen the impacts of climate change.

This issue of *The Professional Edge* highlights several types of energy development in the province (wind, solar and small modular reactors) and the professional engineers and geoscientists that bring these ideas to fruition.

Energy is one blessing Saskatchewan has and the geoscientists at the Saskatchewan Geological Survey are investigating another. Lithium required to power our energy-hungry devices and vehicles may be found in a unique location in our province. One article will be informing our readers on this development.

The aforementioned topics are important, but pale in comparison to another geological resource we have profiled - helium. Why is this so important? Two words: Party balloons!

It may also be used in research centres like the Canadian Light Source for cooling their magnets and as a potential ultra-clean fusion fuel source. But we all know high-pitched kids' voices are the real draw.

The election energy leads to my final request. Our Governance Change project, currently underway, includes improvements to our nominating process. We hope to provide further updates on this in future *Edge* editions.

No matter the process, APEGS is only as good as its councillors. I encourage people wanting to give back to the engineering and geoscience community to consider running for council, the nominating process begins soon.

Warm regards <said in a squeaky helium voice>.



North American Helium is to construct in Saskatchewan the country's largest helium purification facility.

Helium exploration poised to soar

Southwest Saskatchewan a desired location for drilling companies

BY MARTIN CHARLTON COMMUNICATIONS

Helium is on the rise in Saskatchewan. Exploration and production of the now in-demand gas definitely is ripe for an industry resurgence in the province.

Canada has the world's fifth-largest helium resources, with significant underground reserves found here. Over the past five years, almost 20 wells have been drilled within provincial borders, largely in the southwest region.

Pair the available resources with the fact global demand for helium has skyrocketed more than 160 per cent over the past three years and you're left with what has the potential to be a big business in Saskatchewan.

"We see it as the friendliest jurisdiction in the world, with the most favourable economic vision and a government eager to get an industry moving from its infancy and into a more mainstream industry," explained Vance Blydo, P.Eng, vice-president of operations for North American Helium (NAH).

"It won't take over the oil and gas sector, but it'll be a nice complementary industry."

In May, NAH announced it would construct in Saskatchewan the largest helium purification facility in Canada.

The Calgary-based company said its new facility will be built near Battle Creek, along the Saskatchewan-Alberta border. It is expected to be running by July 2021.

NAH has big plans for future helium drilling in the province. It is the most active of the handful of companies that have staked out a total of 1.7 million hectares of helium leases and permits in Saskatchewan. NAH currently has 15 wells in the region and expects to drill 10 more by March 2021.

The company's five-year plan includes wells, separation plants and liquefaction facilities to be a part of the global supply and demand picture currently pegged at about seven billion cubic feet per year.

"This project will bring new jobs and economic growth to the southwest region, a part of Saskatchewan that prides itself on resource development and economic growth," Doug Steele, Cypress Hills MLA and legislative secretary for Energy and Resources, said in an interview with Global News in May.

Setting up shop in Saskatchewan made sense to NAH. According to the Saskatchewan government, recent regulatory amendments include an expanded provincial sales



With the price of helium soaring, companies are lining up for exploration.

“The construction of this plant in the Battle Creek area signals the world-class investment climate Saskatchewan offers and we acknowledge North American Helium for their significant work in the region.”

- Doug Steele, Cypress Hills MLA, Legislative Secretary for Energy and Resources

tax exemption for exploratory and downhole drilling activity. Saskatchewan has a 4.25 per cent royalty rate for helium.

NAH is not alone in its pursuit of Saskatchewan helium. Explorers from across Canada and the United States, as well as the United Kingdom, have expressed interest in the helium potential on the Canadian prairies, with southwestern Saskatchewan being a primary target.

Whether helium is the next big star for the province’s economy remains to be seen. But the potential is certainly there.

“There’s a lot more exploration now than there was five years ago, but it’s still in its infancy,” explained Melinda Yurkowski, P.Geo., in a 2016 interview with *The Professional Edge*.

The assistant chief geologist, petroleum geology unit, with the Saskatchewan Geological Survey at the Saskatchewan Ministry of the Economy added, “We can’t really say where it’s going to lead. It really depends on the quality of the deposits that exploration is going to find.”

Helium, the second most plentiful element in the universe, is in short supply above ground.

Its unique ability to remain a liquid at extremely low temperatures makes it the cooling agent of choice for superconducting magnets in research and medicine, including magnetic resonance imaging machines (MRIs).

Western Canada has an advantage over other new sources of helium in that its best reserves are found in pools made up of 95 per cent nitrogen.

Helium is found roughly two-and-a-half kilometres underground and is drilled similarly to oil and gas, minus the carbon footprint.

The gas is mostly nitrogen with small amounts of other gas and then one to two per cent of helium. Once extracted, the gas is then processed in a purification plant for exporting. It is then transported as gas in a high-pressure tube trailer.

The nitrogen found is vented to the atmosphere.

The extremely high pressure in reservoirs deeper than two kilometres under the surface means wells can be productive for years before being depleted, outlasting shallower pools elsewhere in the world.

Are the deposits found in Saskatchewan the best in the country?

“We feel they are,” Blydo said. “There are deposits in Manitoba, in Alberta, but over the past five years we have worked really closely with the government of Saskatchewan and they have acted almost like a concierge to get this industry off the ground.”

Saskatchewan has been home to helium exploration as early as the 1950s. Luck played a role in the original discovery of helium in Saskatchewan as geologists learned about the potential for helium while searching for oil and gas in the late 1950s and 1960s.

The discovery of the helium resulted in steady production in Saskatchewan from 1963-77. However, when the price of helium dropped, well producers quietly shut the doors and walked away.

“Basically, the price for helium was too low to attract investment,” Blydo explained. “But ... prices have risen quite substantially. People are starting to get back into the business. It’s making economic sense and we were out in front of this with our early investment.”

Arguably, helium’s most popular claim to fame is associated with party balloons. But it serves many valuable uses in science and technology as well. One of the big uses right now is for a cooling gas for MRIs. Because helium is a small molecule and not reactive, it can be used in the manufacturing of semiconductor chips and fibre optic cables, as well as for welding projects and in rocket fuel.

What effect further helium production in Saskatchewan would have on the economy is unknown. But the opportunity is there should additional exploration happen.

“In Saskatchewan, we have the workforce to do it and we have motivated people to bring this industry to fruition,” Blydo said.



Making a case for nuclear

Hurdles need to be cleared before it's a viable option

BY MARTIN CHARLTON COMMUNICATIONS

Saskatchewan would be in a position to cash in should its government be serious about exploring nuclear power in the form of small modular reactors.

This past summer, Saskatchewan Premier Scott Moe and the premiers of Ontario and New Brunswick signed a memorandum of understanding “to collaborate on the development and deployment of innovative, versatile and scalable” small modular reactors (SMRs).

This means that if Canada introduces SMRs to its energy mix, it will need to import enriched uranium to make SMR fuel or purchase the finished fuel from other countries.

Studying SMRs

The enrichment process of uranium processed in Saskatchewan is accomplished outside of Canada. Approximately 90-95 per cent of SMRs that are emerging are fuelled by enriched uranium.

“How ironic it would be that our high-grade uranium is exported from Saskatchewan as raw material, enriched abroad and then re-imported as SMR fuel at greatly increased value,” Esam Hussein, P.Eng., University of

Regina Dean and Professor, Engineering and Applied Science, said in a recent opinion column in the *Saskatoon StarPhoenix*.

“It would be a lost opportunity for new economic activity and jobs in Canada.”

Hussein, who reviewed about 100 SMR designs and found the vast majority require enriched uranium to operate, added there definitely will be a market for the enriched uranium. Should Canada move in that direction, Hussein made the point that relying on other countries to supply our source would be counter-productive.

Saskatchewan is home to the world's largest high-grade deposits of natural uranium in the Athabasca Basin. Less than one per cent of natural uranium is a fissionable isotope, uranium-235, while the remainder is mostly uranium-238, which is not immediately able to produce energy.

Hussein, also a member of the Canadian Nuclear Society and the American Nuclear Society, says the province is slowly moving in the right direction with regards to nuclear energy. Yet challenges persist.

Challenges ahead

Public perception, licensing and proving small modular reactors that are cost-effective are hurdles that need to be cleared before serious momentum can be established.

As a graduate student at McMaster University in Hamilton, Hussein spent four years studying and conducting research in a nuclear reactor that sat in the middle of campus.

It was the first university-based research reactor and has been the highest-flux research reactor in Canada since the closing of the National Research Universal reactor in Chalk River in 2018.

“There were no issues. No concerns. I think that’s because people became familiar with it,” Hussein said.

That’s not to say concerns don’t exist elsewhere.

“We have to respect the public’s perception,” he said.

“Perception may not always be based on facts, however. The risk can be very personal for some and can be very subjective. We all know that driving a car can cause deaths, but that doesn’t stop us from getting up in the morning and driving to work.”

In terms of licensing, it’s a new technology and faces a steep incline.

“It might be more expensive to license it than it would be to build a reactor,” he said. “This is simply because the regulator wants to make sure it is safe. If an accident happens, the reactor can shut down safely and damage can be contained. We have to be able to demonstrate that, but we can’t demonstrate it by building reactors. We’d have to build simulators instead.”

As for the SMRs, Hussein said the small and the reactor labels aren’t new. However, it’s the modular part that is ambiguous and unclear.

“There are people who argue it’s effective and will save construction time and will save cost, while others argue that this view is very simplistic and has to be proven,” he said. “When you assemble components, they have to work in harmony and have to be matching. Unless we can prove it can save time and cost, there’s really no point in going modular.”

Environmental impact

However, Hussein sees a role for nuclear energy in our future especially because it’s environmentally friendly and produces incredibly low greenhouse gas emissions. It would align neatly with Saskatchewan’s other resources and new energy development.

“The least we can do is conduct a study to determine the economic, environmental and social sustainability of an endeavour to enrich uranium and fabricate uranium fuel, considering modern enrichment technologies.”

Lithium exploration in Saskatchewan is poised for big business with the construction of Prairie Lithium in the southwest. Wind and solar energy are making significant strides as well. Could nuclear energy be next?

“The advantage of nuclear is the low greenhouse gas emission, which it shares with wind and solar. The bigger advantage is that it provides a baseload that is independent of weather conditions and provides stability. The stability is very important because most resource systems so far have been designed to have a central supplier and a distribution system. In essence, it’s a one-way street.”

- Esam Hussein, P.Eng., University of Regina Dean and Professor, Engineering and Applied Science.

“To deal with our climate change challenge, we need all the help we can get,” Hussein said. “Each technology adds something, but they also come with their own challenges.”

The recent statement by the three provincial premiers is a recognition of the potential for SMRs to improve the environment while stimulating additional social and economic benefits. This will, however, require re-examination of the prospect for enriching uranium domestically.

If economically feasible, uranium enrichment and fabrication of SMR fuel could become a new industry in Saskatchewan, while enhancing Canada’s energy independence and reliability.

“I would like more emerging engineers to realize our role as engineers is more than technical,” Hussein concluded. “We need to understand new technology in general and convey our understanding to the public ... on the other hand, we learn how to accept the public apprehension. Everything we do affects quality of life. We need to convey that and learn how to convey that ... and that includes nuclear technology and all technologies.”



Rooted in uranium

Local company sees potential for nuclear energy at home

BY MARTIN CHARLTON COMMUNICATIONS

One Saskatchewan-based company is poised to lead the way should nuclear energy make its way to the forefront.

Tron Construction and Mining Limited Partnership is a First Nations-owned general contractor that originated in uranium mining and has expanded its expertise in this specific field across the country.

Nuclear energy is among the sectors Tron specializes in, with experience working in hot zones and sites regulated by the Canadian Nuclear Safety Commission.

Tron was purchased by English River First Nation and for approximately the first 20 years of business focused on supporting Cameco at the uranium mines in northern Saskatchewan in a variety of disciplines.

Fast-forward to more current times, there was an awareness that Tron needed to diversify and that it couldn't rely on one client and one commodity. As a business, it asked how it could transfer the skills it learned operating in the uranium industry and apply them to other projects in the province.

Tron's diversification also expanded from a geographical perspective.

Ontario's market was appealing and partnered well with Tron's expertise.

"It was very clear for us to know that when we went out there we weren't going out there to merely compete against every other construction business that was already established," Anthony Clark, president and CEO of Tron, said from the company's head office in Saskatoon.

"It was more to understand that we have an actual skillset based on the nuclear mining industry that we've grown up in."

In January 2019, Makwa Development Corp., and Tron signed a supplier agreement with Bruce Power, as part of the electricity company's ongoing investment program.

This new joint venture is 100-per-cent First Nation-owned and is situated on the Nawash First Nation – bringing together a First Nation whose traditional land is the source of raw ore for nuclear fuel with another where materials are processed to produce clean energy.

Nuclear energy is the second largest contributor of non-emitting electricity in Canada. Nuclear energy provided approximately 16 per cent of Canada's total electricity needs (close to 60 per cent in Ontario).

In 2018, Canada produced 6,996 tonnes of uranium – valued at approximately \$800 million - all from mines in northern Saskatchewan. Most of Canada's reserves are located in the Athabasca Basin, which hosts the world's largest high-grade deposits, with grades that are 10 to 100 times greater than the average grade of deposits mined elsewhere in the world.

“It's a technology that is still being trialed and tested and is early in the evolution of that. With partnerships with Cameco and Bruce Power and strong support from local governments, I think we could certainly see some of those SMRs constructed in the western region.”

Clearly, there's a business opportunity in Saskatchewan. Tron is ready to pounce if and when that happens.

"We've definitely seen there's good support for the future of nuclear power generation in the form of SMRs (small modular reactors)," said Clark.

Which plays into Tron's wheelhouse.

“That’s where we position ourselves very strongly to participate in that activity,” Clark said. “Northern Saskatchewan still holds the highest-grade uranium reserves in the world. So, as those technologies come online, there’s definitely a strong resurgence for uranium in the market. It’s a good source of clean energy.”

There is a lot of nuclear activity taking place in Ontario. But it’s not from the mining perspective. It’s more from the power generation and conversion perspective.

Tron played a significant role in Cameco’s McArthur River/Key Lake mine. Once home to the world’s largest

high-grade uranium, this mill’s main focus was on processing ore from McArthur River Mine, which Tron provided construction services on a number of projects at the mill to that effect.

Saskatchewan is an interesting location in terms of being a hub for technology and innovation.

“It’s an extremely innovative province when you talk about the makeup of the people who live here,” Clark said. “We almost don’t give ourselves enough credit in that sense in terms of innovation and business solutions that have formed here and can be taken to a national level.

“ We need to recognize the worth this province has. From the Indigenous aspect, we’ve got some leaders in Indigenous businesses that can be really good examples for other economic development corporations across the country. ”



Tron Construction and Mining Ltd., a Saskatchewan-based company, sees good support for the future of nuclear power generation in the form of small modular reactors.



Did You Know?

Presentations in the times of COVID-19

Were you scheduled to give a presentation in 2020, but it was cancelled due to the pandemic? The time spent preparing for that presentation is still eligible for CPD credit under the Presentations category.

First-Nation creates carbon-free electricity

Hybrid facility viewed as an industry leader

BY MARTIN CHARLTON COMMUNICATIONS

A hybrid energy storage facility in southern Saskatchewan is the first of its kind in Canada and could hold that distinction globally as well.

“We need to be careful when we’re using those labels, but as far as I know it is the first of its kind, it very well could be,” said Ryan Jansen, P.Eng., a senior research engineer at the Saskatchewan Research Council (SRC), who served as the technical lead on the Cowessess Renewable Energy Storage Facility Project.

The facility – which generates solar and wind power and stores it in a battery – is located on land owned by Cowessess First Nation, approximately four kilometres east of Regina. It was the country’s first utility-scale hybrid renewable energy system.

Background

The facility came online in 2013 as a partnership between Cowessess First Nation and the SRC.

The project began with an 800-kilowatt wind turbine and 400-kW / 744-kWh lithium-ion battery. In 2018, 1,418 solar panels were added. The 400-kilowatt solar array is fully integrated into the existing wind-battery system.

How it Works

The facility can produce more than 2,800 megawatt-hours of energy per year. That’s enough to supply approximately 340 homes.

SaskPower signed a 20-year contract to buy the electricity generated by the project, with profits going to Cowessess First Nation.

The hybrid nature of the facility helps overcome the challenges faced by renewable energy systems.



This hybrid facility came online in 2013 as a partnership between Cowessess First Nation and Saskatchewan Research Council.

The solar array generates power only when there is enough sunlight. Output from the wind turbine fluctuates with varying wind speeds. Both systems feed into the battery, which smoothens the combined output by shaving the peaks and filling the valleys.

Electricity can be stored when production is high and used when it’s overcast and the wind is calm.

The wind-solar-battery system also is capable of time-shifting electricity from off-peak to on-peak hours when the electricity has its highest value.

In addition, lithium-ion battery systems can respond to changes in wind and solar power in less than one second. The system has been proven to be capable of smoothing the variable wind-solar output by up to 84 per cent.

This reduction in volatility is needed in order to reliably increase the level of wind and solar penetration on the electrical grid.



A hybrid energy storage facility on the Cowessess First Nation is the first of its kind in Canada.

Predicting the Weather

The system also is capable of making predictions based on weather patterns.

Weather information was scraped hourly from public weather information services (i.e.: The Weather Network) to determine predicted wind and solar resources. The system then calculated the average predicted power output of the wind-solar hybrid.

“We automatically charged and discharged the battery to clamp the hybrid system’s generation at the predicted power output for the entire hour before recalculating the next hour’s average power and readjusting the battery setpoint once again,” Jansen said.

“When the utility is deciding what assets they need to have in place in the coming hour, they could look at Cowessess and see what we are planning.”

Not Building from Scratch

While considered a ground-breaking facility in terms of capabilities, the technology used wasn’t all developed from scratch. Jansen said they were able to take varying degrees of maturing equipment and intertwine them into a new configuration.

The individual parts were reliable and known. The challenge was being able to integrate them into a system that was going to be reliable.

Saskatchewan Research Council collaborated with the people of Cowessess from day one of the project, as they own all assets under their company Cowessess Wind Development Ltd, which is part of the Cowessess Ventures Ltd. portfolio of companies.

“ We could dispatch more power in the morning and again in the evening, two of the peak times of day,” Jansen explained. “Ultimately, we could marry the hybrid into the SaskPower control centre and when they need power, they could use our battery to help meet the requirements.”





Mother Nature lends a hand But reliability a challenge in wind, solar power

BY MARTIN CHARLTON COMMUNICATIONS

How will SaskPower achieve its goal of reducing greenhouse gas emissions? The answer may be blowing in the wind.

With dozens of renewable energy projects – wind and solar power - in the construction phase, SaskPower is making significant strides towards a cleaner future.

Currently, SaskPower has approximately 240 megawatts of wind generation on its system. Plus, it's in the process of building another 400 megawatts of wind power through contracts awarded to independent power producers (IPP).

By the end of 2023, SaskPower anticipates to nearly triple the amount of wind generation. By the end of 2023-24, it hopes to have one of the highest amounts of wind power percentage-wise in power generation of any province in Canada.

“We’re taking some pretty significant steps to clean up our electricity system so that it doesn’t have the greenhouse gas intensity that it has today or had in the past,” explained Mark Peters, P.Eng., Director of IPP Development at SaskPower.

SaskPower is working at developing solar generation options and is looking at smaller projects. It is in the middle of adding 40 megawatts of solar power at four different projects across the province. Through other programs, it is adding another 30 to 40 megawatts and aims to be at close to 80 megawatts of solar in the next two to three years.

“Our customers are expecting us to move in that direction,” Peters said. “And I think we are doing the right things to do it in a responsible and cost-effective way.”

SaskPower emissions decreased in 2019 compared to the previous year. Moving towards 2030, it plans to start replacing conventional coal with lower-emitting generation which in part will include wind and solar.

Right now, conventional coal makes up 31 per cent of power generation capacity in Saskatchewan. However, federal regulations on greenhouse gas emissions have spurred SaskPower into reducing its greenhouse gas emissions by 40 per cent from 2005 levels by 2030.

Saskatchewan has six wind power facilities operating in the province, with its power capacity from wind pegged at about five per cent.

The current cost of wind (approximately \$35 per megawatt hour) is about half what it was in 2010 (approximately \$70 per megawatt hour). Solar power is currently similar to where wind was 10 years ago in terms of pricing.

“**Wind has come down in price and it’s to the point where it is starting to make good business sense. It is a cost-effective way of producing power,” Peters explained. “Solar power still has a way to go. The cost of solar may be twice the price of wind, but it’s continuing to come down. I suspect solar will get there eventually.**”

With wind and solar power generation being emissions-free, there is no carbon tax attached to them.

That’s not to say wind and solar power generation aren’t without their challenges. The biggest one being that both rely on Mother Nature, meaning they can’t be controlled or assumed reliable.

“How do we integrate an intermittent type of generation like wind or solar that both fluctuate quite a bit from hour to hour and then layer on top of that the demand for electricity in this province?” Peters asked.

“You need generation you can rely on to meet the demand, while at the same time compensate for the fact that wind is fluctuating up and down. It’s difficult enough to match generation with load. But then layer in a generation type that you can’t control. That becomes a more complex problem to solve. It’s another variable that we need to solve to deliver electricity in a reliable fashion.”

“We’re taking some pretty significant steps to clean up our electricity system so that it doesn’t have the greenhouse gas intensity that it has today or had in the past.”

- Mark Peters, P.Eng.
Director of IPP Development at SaskPower

“On the coldest and darkest day in January you want something you can turn on. Therein lies one of the challenges we have in Saskatchewan. You have to have some kind of backup generation to meet demand.”

It’s no secret southwestern Saskatchewan is considerably windier than elsewhere in the province. That’s where there’s an abundance of fuel in terms of wind power.

But dotting the landscape along the Saskatchewan-Alberta border with dozens of wind turbines isn’t as simple as it sounds.

Saskatchewan’s Centennial Wind Power Facility, completed in 2006, is southeast of Swift Current and capable of providing enough power for nearly 70,000 homes.

The facility is home to 83 wind turbines built on 7,500 acres of land. Each turbine is capable of producing 1.8 megawatts of power when there is sufficient wind. The turbines get their full power at wind speeds of 50 kilometres per hour. But they’ll run when wind speeds are between 15 and 90 km/h.

Peters was involved with this project. He recalls the variables that went into finding the most ideal location. They considered the best spot from a wind perspective and transmission accessibility to the site, in addition to finding willing landowners and minimizing the environmental footprint.

Plus, Peters noted there is a competitive market for the development of wind power projects by the private sector.

“Because we’re engaged in the development of wind by the private sector now ... they bid into the process,” Peters said. “We select which is the best value by assessing a number of things including interconnection costs.”

“The competition drives the ideal location in terms of pricing, community engagement, Indigenous participation and environmental impact. We allow the marketplace to prepare proposals and then evaluate the proponent proposals for each site to find the best location.”



Here’s a brief snapshot of the wind and solar generation projects SaskPower is developing over the next couple years:

Golden South Wind (Potentia)

Located near Assiniboia, this project is currently under construction. It is expected to be online in March 2021 and produce up to 200 megawatts.

Riverhurst Wind (Capstone)

Located near Riverhurst, this facility is currently under construction and is expected to come online by the end of 2021.

The three turbine project will produce up to 10 megawatts.

Highfield Solar (Saturn)

Located east of Swift Current, this project is expected to break ground in late 2020 and come online in September 2021.

The 100-acre facility will produce up to 10 megawatts.

Blue Hill Wind (Algonquin)

Located near Herbert, this facility is currently under construction and is expected to be operational by the end of September 2021 and produce up to 175 megawatts.

Foxtail Grove Solar (Kruger)

Located east of Regina, this project is in the early stages of development. It is expected to be online in September 2022 and produce up to 10 megawatts.

Could lithium be next?

Saskatchewan positioning itself as global player

BY MARTIN CHARLTON COMMUNICATIONS



The global demand for lithium is forecast to grow by 10 per cent per year between 2019-24.

Garvin Jensen, P.Geo., could be labelled somewhat of a brine connoisseur. Over the last nine years Jensen, P.Geo., Senior Research Petroleum Geologist with the Saskatchewan Geological Survey, Ministry of Energy and Resources, has been sampling oilfield brines to determine the concentration of lithium and the potential to extract it as a new source of that element which is a key component of batteries used in electrical vehicles.

Currently most lithium is extracted from brines that are pumped from very shallow wells in arid regions or mined from granitic pegmatite ores.

Call it unorthodox. Perhaps unusual. But it also could be a highly lucrative opportunity for the provincial economy.

"I would say it's pretty unique," Jensen said, adding he first sampled well heads for his master's thesis from 2003-05. "We would arrive at the well head and they'd look at me funny and ask, 'Why do you want the water? You know that we're producing oil and the money is in the oil, right?' No one really looked at the resource in the water. It was essentially a waste."

Until recently.

In 2011, the Ministry of Energy and Resources began a program of sampling brine from producing wells in the province as a response to the demand for lithium and other trace elements that could potentially be derived from basinal brines.

During the field seasons since then, samples of brine were collected from numerous wells in the oil-producing region of Saskatchewan and sent for geochemical analysis of their trace elements.

The results of analyses of the brines from the formations that were sampled show that lithium concentration varies among the formations.

Since 2011, wells in southeastern and west-central Saskatchewan have been sampled. A database of major and minor elements present in the formation waters in Saskatchewan was developed.

Standard brine analysis completed by the oil and gas industry only typically measures for major elements, making this data some of the first publicly available for trace elements in brines from the province.

So far Jensen's work is based on limited sample locations, has identified two lithium-rich brine areas in the province. Both are the in Devonian aged Duperow Formation in the southeast corner of the province near Weyburn, and in the west-central region in the Kindersley.

Resampling of wells was conducted in 2018 to verify that consistent trace element concentrations exist over time, to ensure that any future lithium-producing project will be economically viable.

Currently, Chile hosts almost half of the world's lithium reserves (48 per cent) with China (20 per cent) and Australia (17 per cent) among the top three lithium-rich countries.

Saskatchewan, however, is positioning itself to become a global player in lithium exploration and extraction. The potential is relatively unknown.

Canada and the United States entered a joint action plan on critical mineral collaboration in early 2020. This collaboration identified 35 minerals that are critical to ensure the continued economic growth and national security of both nations.

"No one knows what the potential is in the brines yet. We've started to look at lithium and barium for example, but no one has looked at other elements such as rare earth elements in brines or things like that, to see if there are any critical minerals," Jensen explained. "We have this massive volume of formation waters in the Williston Basin and in the Alberta Basin part in Saskatchewan."

"No one has really sampled the oil wells to look at the water chemistry beyond the standard testing that is commonly done for oil production."

Prairie Lithium Corporation arrives

Prairie Lithium Corp. — a Regina-based lithium exploration junior that holds more than 35,000 acres of exploration permits in Saskatchewan — partnered with Calgary-based LiEP Energy Ltd. on a pilot project that will see it produce lithium hydroxide from Saskatchewan oilfield brines.

The project began operations in July. The second phase is scheduled for late 2021.

Stage two will include the construction of one of Canada's first lithium extraction and refining facilities, which will produce approximately one tonne of lithium hydroxide per day, resulting in 365 tonnes per year. This will serve as a demonstration plant prior to full commercialization.

The facility would utilize existing suspended oil and gas assets and provide a transition alternative for aging oil and gas infrastructure.

The Honourable Bronwyn Eyre, Minister of Energy and Resources, said the concept also has a good environmental footprint.

"It's good for sustainability because it transitions those aging oil wells into another use," she said in June in a prepared statement. "(It's) good for diversification here in Saskatchewan."

Saskatchewan's oil and gas-producing reservoirs are also rich in lithium deposits.

Lithium is invisible and odourless in Saskatchewan's oil field brine. This is why oil companies have been producing and disposing of lithium without even knowing it.

According to Zach Maurer, president and CEO of Prairie Lithium Corp., there's a tremendous amount of lithium in western Canada. With the oil industry struggling, this could be a way to use the infrastructure and skills already in place.

"There's a huge opportunity right now to transition some of these suspended wells and utilize existing brine-well production," Maurer told CTV News earlier this year.

Maurer explained the extraction process sees lithium extracted from oilfield brine water through a series of chemical reactions.

The lithium-free brine water is then sent back down a hole for disposal. The extracted lithium can be sent for further refining into battery-grade materials.

The process is anticipated to take less than six hours, compared to the current industry standard of 18 months.

Global demand growing

In 2011, lithium demand globally was estimated to be between 104,000-115,000 tonnes. By 2020, that number was expected to reach between 280,000 to 360,000 tonnes and is expected to grow by 10 per cent per year until 2024.



The Saskatchewan Geological Survey began a program of sampling brine from producing oil wells in the province as a response to the demand for lithium that could be derived from basinal brines.

Batteries represent up to 45 per cent of the lithium market, but it is also used to produce glass and ceramics (up to 30 per cent) or greases and lubricants (up to 10 per cent).

The rapid growth in global demand for the metal is a recent phenomenon driven in large part by the rise of the electric car and its lithium-ion batteries and a demand for mobile energy like cellphone batteries. The high-capacity battery packs on each electric vehicle can use more than 63 kilograms of lithium.

Rechargeable lithium-ion batteries are particularly important in efforts to reduce global warming. They make it possible to power cars and trucks from renewable energy like hydroelectric, solar or wind instead of by burning fossil fuels.

The Covid-19 pandemic has played havoc with the price of lithium. However, prices are expected to rebound to levels pre-Covid in 2022.

"The lithium industry has the potential to be another significant economic driver and help our province through economic recovery," Trade and Export Development Minister Jeremy Harrison said in June in a prepared statement.

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

Renewal notices are in the mail



Renewal notices were sent 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.

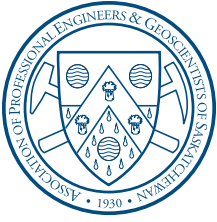
Eligibility for Life Membership



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.

Report on the 90th Annual Meeting of the Association



The 90th Annual Meeting of the Association was called to order virtually through Microsoft TEAMS at 9 a.m., on Friday, September 18, 2020, with 196 voting members in attendance.



This year's meeting had incredible turnout, but you wouldn't know it from the empty room where the virtual meeting was held.

The business of the meeting included:

- Minutes from the 2019 Annual Meeting;
- Business arising out of the minutes;
- Reports from committees;
- Audited financial reports;
- New business
- Including four bylaw amendments (*see article page 25*)

Report of the scrutineers:

The Executive Director and Registrar reported on the results of the 2020 council elections. The total number of votes cast was 1,875 (1,859 electronic and 16 by mail), being 14.8 per cent of the 12,669 total eligible voters. There was one spoiled ballot.

The results of the vote were:

Officers of Council – One-year term

President – Andrew Lockwood, P.Eng., FEC

President-Elect – Kristen Darr, P.Geo.

Vice-President – John Desjarlais, P.Eng.

Councillors – Three-year term

Group VI (Chemical, Metallurgical and Ceramic) –
Patricia Lung, P.Eng.

North District – Ian Farthing, P.Eng.

Southwest District – Aaron Phoenix, Ph.D., P.Eng., FEC

Geoscience North District – Alix Cruickshank, P.Geo.

Returning Members of Council

Terry Fonstad, PhD, P.Ag, P.Eng., FEC, FGC (Hon.) – Past President

Nicholas Kaminski, P.Eng. – Group I (Civil)

Lesley McGilp, P.Eng. – Group II (Mechanical and Industrial)

Kaylee Tumack, P.Eng. – Group III (Electrical and Engineering Physics)

Erin Moss Tressel, P.Eng., P.Geo, FEC – Group IV (Geological, Mining, Petroleum, Geophysics and Geoscientists)

Kurtis Doney, P.Eng. – Group V (Agriculture and Forestry)

Danae Lemieux, P.Eng. – Group VII (Environmental)

Nicole Barber, Engineer-in-Training – Members-in-Training

Jessica Theriault, P.Eng. – South East District

Gavin Jensen, P.Geo. – Geoscience South District

Wendell Patzer – Public Appointee

In addition, a new Public Appointee, Stuart Ritchie, was appointed by Order in Council on recommendation of the Minister of Highways and Infrastructure.



APEGS Past President Terry Fonstad, Ph.D, P.Eng., P.Ag., FEC, hosted the 2020 annual meeting as president for that reporting year.

Report on the 90th Annual Meeting of the Association



Since the APEGS awards banquet that occurs as part of the annual meeting and conference each May was cancelled due to the pandemic, APEGS celebrated the award recipients listed below at the annual meeting.

Videos of each recipient were presented before meeting proceedings began and during the break. To view the videos, visit apegs.ca under About Us / Annual Meeting and PD Conference.

For photos and biographies of recipients, refer to the May/June issue of *The Professional Edge*.

Brian Eckel Distinguished Service Award – Dennis Paddock, P.Eng., FEC, FGC (Hon.)

Outstanding Achievement Award – Jim Christopher, P.Geo.

McCannel Award – Matthew Dunn, P.Eng.

Exceptional Engineering/Geoscience Project Award – Harpreet Panesar, M.Sc., P.Eng.

Environmental Excellence Award – Michael Nemeth, P.Eng., Leed AP

Promising Member Award – Kai Li, P.Eng.

Friend of the Professions Award – Megan Moore

APEGS also celebrates the following members who received other awards:

Cordelle Thomasma, P.Eng., received the Gerry Zoerb Award for achieving the highest mark in the Principles of Professional Practice Exam for 2019.

Terrance A. Fonstad, P.Eng., FEC, FGC (Hon.) received a certificate of fellowship and the privilege of using the designation Honorary Geoscientists Canada Fellow (FGC Hon.) from Geoscientists Canada upon recommendation from APEGS in honour of exceptional contributions to the geoscience profession.



The following members received a certificate of fellowship and the privilege of using the designation **Fellow of Engineers Canada (FEC)** from Engineers Canada upon recommendation from APEGS in honour of exceptional contributions to the engineering profession:

Christopher Conley, P.Eng., FEC

Denard Lynch, P.Eng., FEC

Erin Moss Tressel, P.Eng., P.Geo., FEC

Leo Niekamp, P.Eng., FEC

Spiros Philopoulos, P.Eng., FEC

Maurice Tremblay, P.Eng., FEC



Terry formally inducted President Andrew Lockwood, P.Eng., FEC, with the chair of office as president for 2020-2021.

Change to Competency-Based Assessment (CBA) for Geoscience Work Experience

The APEGS membership voted in favour of changing to Competency-based Assessment (CBA) of work experience for geoscientists-in-training. The new online CBA system will allow geoscientists-in-training, validators and assessors to better gauge whether experience qualifies for professional registration. The change comes into effect January 1, 2021.

Does This Affect You?

If you are a geoscientist-in-training who has not submitted at least one complete experience report in the outgoing, paper-based system by January 1, 2021 then this applies to you. We are also encouraging everyone who has already started reporting in the outgoing, paper-based system to switch to the new CBA system. See the APEGS website under Members, “Competency-Based Assessment – Geo” for more details.

How to Access CBA Online.

APEGS will notify you when the CBA online system is ready for geoscientists-in-training to start entering their competencies. The website for the online system is <https://competencyassessment.ca>. Follow the instructions on the site to create your account. Your APEGS registration file # is required. APEGS will be contacted to authorize your account because the CBA system is separate from the APEGS database.

Benefits of CBA.

CBA makes experience reporting easier and more transparent. It is highly recommended that geoscientists-in-training switch to the new CBA system even if they have already submitted reports in the outgoing, paper-based system. You may use experience examples from the paper-based system, but you must transfer the information from there in the online CBA system for it to be considered.

It is easier to gauge if your experience qualifies for professional registration and therefore increases your confidence when writing your submission.

- What constitutes acceptable geoscience work experience has not changed. It is more explicitly described.
- There are “workplace examples” in the system to provide more insight into what type of work will satisfy a competency.
- Workplace examples help applicants interpret the competency descriptions to better understand which experience to include.

It is more quantitative and objective.

- There is an explicitly described rating scale from 0 to 5 that applicants, validators and assessors all use.

Only 29 examples required.

- You provide one example for each of the 29 competencies from any time in your entire geoscience work history. You do not have to describe all your work experience in detail.

It is online.

- The online system facilitates all information entry, sharing and notifications. No more coordination of supervisor signatures is required by the applicant.




This is the home page of the CBA system.

COMPETENCY ASSESSMENT

Home Login

Engineering and Geoscience Competency Assessment

This system is for professional registration or licensure applicants to record their progress in meeting the competency requirements for engineering or geoscience experience and have it validated and assessed.

Applicants	Validators	Assessors
 <p>Applicants complete a competency self-assessment using examples drawn from work experience to demonstrate achievement of each competency.</p>	 <p>Validators review the applicant's competency self-assessment and provide validation and competency-level ratings for the examples that the applicant has assigned to them. They also provide overall feedback on the applicant's readiness for professional registration or licensure.</p>	 <p>Assessors review the applicant's competency self-assessment and validator feedback and determine for each competency whether the example provided represents sufficient evidence that it has been met at the required level. They also provide a recommendation on the applicant's readiness for professional registration or licensure.</p>



2021 Saskatchewan Geoscience Calendar is available

The Saskatchewan Geological Society's calendar is in its sixth year of production. The images selected represent an excellent selection of interesting geoscience features from across our province including landscapes, rocks, fossils, a thin section, a painting and drone and satellite imagery.

The calendar is also packed with information in the Did You Know, Digging Deeper and Fun Fact sections.

The calendar is available for purchase in Regina at the MacKenzie Art Gallery, the Royal Saskatchewan Museum

and the University of Regina bookstore and in Saskatoon at the University of Saskatchewan bookstore, the U of S Geology Department and McNally Robinson bookstore.

Proceeds from calendar sales help the society conduct future outreach projects, provide an incentive for a potential seventh edition and facilitate additional luncheon talks. Calendars left over in January are donated to schools.

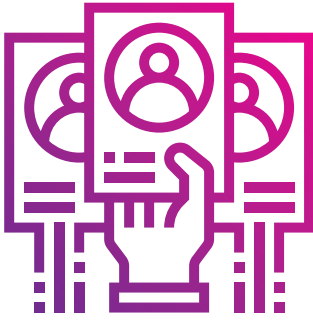
The society is seeking photos for the next geoscience calendar. Visit the website for details.

The calendar retails for \$10 (1-4 copies), \$8 (5-9 copies) and \$6 (more than 10 copies).

You can also place larger orders online by completing an order form.

Check the society's website for further details at www.sgshome.ca

Call for Council Nominations - 2021 Elections



Nominating Committee

The Nominating committee is soliciting names for the council positions described below. To propose names of potential candidates contact staff support to the Nominating committee, Shawna Argue, at sargue@apegs.ca. Shawna may also be reached through the APEGS office in Regina by phone at 306-525-9547 (toll free 1-800-500-9547 North America) or facsimile 306-525-0851.

The Bylaws require the Nominating Committee to nominate, whenever possible, the person holding the office of President-Elect for President, and one person for the position of President-Elect (typically the person holding the office of Vice President). Kristen Darr, P.Ge. is the current President-Elect and John Desjarlais, P.Eng. is the current Vice President. The Nominating Committee is also required to nominate, whenever possible, at least two persons for Vice President and at least two persons for each vacancy on the Council.

Submissions of Nominations

Any five members may nominate over their signatures an eligible nominee for any elective office, except that of President. Such nominations shall be in the hands of the Registrar at least forty-five days before the election is to

take place. To meet this requirement, the nominations must be in the APEGS office no later than 5 p.m., Thursday, March 4, 2021, as the election will take place when ballots are counted on Monday, April 19, 2021, the “polling day”.

2020 Vacancies & Terms of Office

Officers

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

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

- Group II (Mechanical and Industrial)
- Group V (Agriculture and Forestry)
- South-East District
- Geoscience South District
- Member-in-Training

Terms of Office

Only members in good standing are eligible for nomination.

A person elected to Council may only hold office while a resident of Saskatchewan.

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

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

Check us out on-line!

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

www.apegs.ca/e-edge



Council Notes

The APEGS Council held a hybrid in-person/virtual meeting via Microsoft TEAMS on September 16 & 17, 2020 in Regina. The meeting was attended by 19 of 19 Councillors and the Directors to Engineers Canada and Geoscientists Canada. Council will meet next on December 3 & 4, 2020 in Saskatoon.

Council received the following presentations and information items:

- The Directors responsible for staff support to the Investigation and Discipline Committees presented an overview of the APEGS investigation and discipline processes.
- The Communications Manager provided an update on the 2020 Strategic Communications Plan.
- The APEGS Director of Special Projects and members of the Steering Group provided an update on the Governance Change Project.
- Activity updates were provided from the constituent society liaisons, the ACEC-SK liaison and the Nominating Criteria Task Group
- The APEGS Director to Engineers Canada provided a written report and a verbal update on the activities of the national organization.
- The APEGS Director to Geoscientists Canada provided a written report and verbal update on the activities of the national organization.
- The Draft 2021 budget was provided to Council for discussion purposes.

Council passed motions as follows:

- Approving policy Coun12.0_Volunteer PD Days Reimbursement.
- Approving policy ADMIN10.0_Recording of Meetings.
- Approving the Governance Change Project Blueprint and Feasibility Plan templates.
- Approving the Feasibility Plans for Governance Change Project recommendations #6 (make the complaint process more transparent to the public and practicing professionals (by making content more evident on the website)) and #14 (transfer Legislative Liaison Committee responsibilities to staff and stand down the committee), as well as approving the recommendation.

- Approving the appointment of John Unrau, P.Geo, FGC to the Nominating Criteria Task Group.
- Approving the updated Terms of Reference for the Academic Review Committee.
- Approving the development of a virtual Law & Ethics Seminar for the fall 2020 seminar.
- Approving the use of the National Professional Practice Exam (remotely proctored) for the fall 2020 PPE.
- Approving the updated policy PPE1.0-Professional Practice Exam.
- Approving updates to the Guideline for Alternate Arrangements and Special Accommodations for the PPE and Law & Ethics Seminar.
- Approving the Guide for Licensee Applicants – Competency-Based Assessment (CBA).
- Approving revisions to the Guide for Licensee Applicants.
- Authorizing the CPD Compliance Committee to conduct Assurance Reviews from a random sample of members who reported in 2019 and met an established review criterion.
- Approving nine new Life Members.
- Fixing April 19, 2021 as the polling day for the 2021 Council elections.
- Appointing the following to the Nominating Committee for the 2021 Council Elections: Terry Fonstad, Ph.D., P.Ag., P.Eng., FEC (chair), Stormy Holmes, P.Eng., FEC, FGC (Hon.), John Unrau, P.Geo., FGC, Patti Kindred, P.Eng., FEC, Ryan MacGillivray, P.Eng., Robert Cochran, P.Eng. and Nicole Barber, Engineer-in-Training.
- Appointing the following as the scrutineers for the 2021 Council Elections: Terry Fonstad., Ph.D., P.Ag., P.Eng., FEC and Shawna Argue, P.Eng., MBA, FEC, FCSSE, FGC (Hon.).
- Approving one-year extension requests for 34 members-in-training.

Council noted and received the following reports:

- Registrar's reports for June, July and August 2020.
- The unaudited financial statements for May, June and July 2020.
- Executive Committee minutes, board minutes and the reports from the committees and task groups, abridged Investigation Committee minutes and Discipline Committee minutes

APEGS Governance Change

Two recommendations are being implemented further to council approval in September. They 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 is moving forward using the approach council approved in September to address the other 31 recommendations on governance change. Staff are continuing to prepare feasibility plans and proposals to address recommendations. The Steering Group, with assistance from the consultants and staff, is drafting a schedule for carrying out the work in the feasibility plans, for council's consideration. Steering Group is meeting regularly to navigate the detailed work on the project.

Going into 2021, staff will continue to prepare feasibility plans and proposals on recommendations. Population of the schedule will continue as feasibility plans are completed. Council liaisons have been informing committees and boards of the recommendations that may affect them. Council meets in December to consider progress made on 18 recommendations. 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 33 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.
- Sep/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.

- Jul/Aug 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, roles of committees and staff, training for committees, and the relationship with constituent societies.
- Sep/Oct 2020 issue – Council approved two of the recommendations and staff continued to prepare feasibility plans.

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.

Member Profile



Omar Nawara, P.Eng.

In this issue, *The Professional Edge* chats with Omar Nawara, P.Eng., an environmental consultant at Arcadis Canada in Saskatoon.

Tell us about your personal and professional background.

I was born and raised in Cairo, Egypt. When I was 17, I was offered an International Student Scholarship, which made it possible for me to fulfill my ambition of studying abroad.

Moving to Canada to study engineering was quite the change for me. While a student, I worked at AECOM on a 16-month term. The experience was fantastic and taught me a lot about myself, the industry and just professional life in general.

Eventually, I graduated from the University of Saskatchewan with a Bachelor of Science in environmental engineering.

Now, I am a project manager at Arcadis Canada's Saskatoon office in Innovation Place.

Why did you choose engineering?

I loved science, mathematics and technology. Not to mention, I am extremely analytical, so I was drawn to this career.

It did end up working out for me and I was by no-means pigeon-holed into a specific role. I am lucky that within my current role, I get to explore many other interests like business, analytics and leadership and mentoring.

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

My dad was a big influence on me. He started out as a mechanical engineer and worked for Schlumberger at the start of his career.

Even though he did not spend more than five years as a practising engineer, he always emphasized how being an engineer helped him see things differently and that it opened a lot of doors for him.

So, I was always of the mentality that an engineering background can be an asset in more ways than one during one's life and career.

What was your first job after university?

I was hired as a geo-environmental engineer at Advisian. It involved a lot of fieldwork and time away from home. On the upside, I ended up with a solid foundation on field methods that has served me well since then.

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

Growing as a mentor has been extremely rewarding. I love helping people move beyond doing great work in their role and making it their own. I feel privileged when people trust me with something that's so important to them and I feel it makes me become better as well.

Another rewarding aspect as a consulting engineer has been my ability to exercise my professional judgement in a way that aligns with my professional beliefs. I have had moments when I give a recommendation of action that I know may be unpopular but is one that I believe to be correct.

What are your interests outside of work?

I love reading, staying active, spending time with friends and loved ones and meditating. I have been going on some long walks (three-plus hours) lately and it has been great just giving myself some downtime.

I am also a huge fan of live music ... and tinkering with computers and technology and the occasional gaming session.

I also like adventurous cooking. The pandemic has helped explore that hobby a lot more.

What is your favourite vacation spot?

For the nostalgia factor, my favourite spot would have to be Egypt's North Coast on the Mediterranean Sea. We used to go there with my cousins and grandparents and friends every summer.

Today, my favourite spot would be the Rocky Mountains - Jasper, Banff and the Kootenays.

What is your favourite book?

My favourite book is *Fooled by Randomness* by Nassim Nicholas Taleb – actually, his whole *Incerto* series. It really changed my outlook on risk in general and has affected how I do things everyday.

What do you do for continuing professional development?

I like to attend conferences, seminars and take formal courses. Our company also has a lot of professional development programs and I have been heavily involved in those.

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

My parents have always supported me with whatever I chose, so I am lucky and grateful to have had them in my corner all this time.

Is there anything else that you would like to share?

For people starting or looking to start their careers, I just want to give some parting advice should you find it useful.

Even if you know exactly where you want to go with your career right now, try to expose yourself to as many different situations and people as you can.

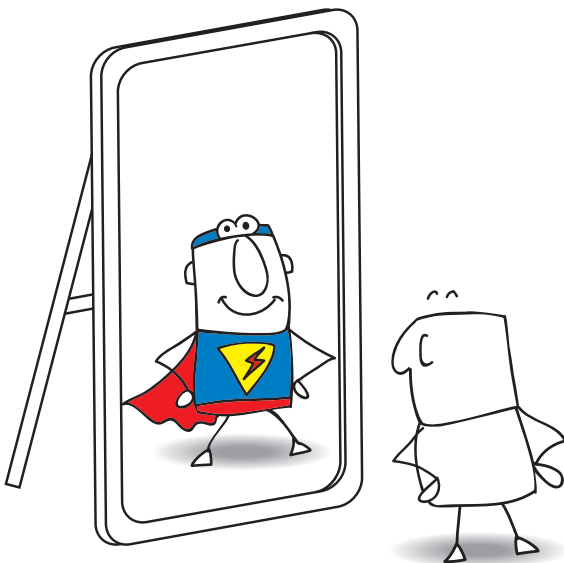
Really diverge with things when you start. You can always converge later.

Not only will you learn more about yourself this way, but you will also get to experience the wonders of serendipity rather than being stuck in your bubble.

Take some risks, explore your interests and invest in relationships with different types of people while trying as many things as possible in your career.

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.

Continuing Professional Development

To assist members in meeting their CPD goals, APEGS has compiled a list of resources organized by industry at apegs.ca under CPD / Professional Development Links. Organizations interested in being listed can email cpd@apegs.ca with a brief description of the PD offered.

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.

Professional Development Opportunities

2021 Spring Professional Development Days

Due to the current pandemic, all in-person courses are cancelled for the near future.

Instead, a variety of virtual courses will be offered in March 2021. Stay tuned for more details.

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

Does Your Next Meeting Need an Ethics Topic?

Monthly ethics moments are available to APEGS 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, 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.

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.

Important Notice – Reporting Deadlines

Members are reminded that they have until December 31, 2020 to earn credits for the 2020 reporting year.

While members can update their APEGS online CPD report at any time, the deadline to have all 2020 CPD information entered online is January 31, 2021.



CPD Tip:

What Activities Are Eligible for Contribution to Knowledge Credit?

Contribution to knowledge includes activities that expand or develop the technical knowledge base in the disciplines of engineering and geoscience. Contributions could include:

- development of published codes and standards - 1 credit per hour of committee work
- patents - 15 credits per patent registered
- publication of papers in a peer-reviewed technical journal/textbook chapter - 15 credits per paper published
- publication of articles in non-reviewed journals - 10 credits per article, to a maximum of 10 credits per year
- publication of a technical textbook - 60 credits per book published, to a maximum of 30 credits a year
- reviewing articles for publication - 1 credit per hour of review, to a maximum of 10 credits per year
- editing papers for publication - 1 credit per hour of editing, to a maximum of 10 credits per year.

Gems of Geoscience



Monica Tochor, P.Ge., is a Senior Production Geologist and Underground Project Geologist with Mosaic Company. She is a graduate of the University of Saskatchewan (B. Sc in Geology).



Cluster of Gryphaea fossils in Lower Cretaceous Shale of the Lower Colorado Group (Joli Fou Formation)

I am a geoscientist because I love to explore.

My excitement for learning, combined with well-timed advice from my beloved Grade 8 science teacher Myles Gillespie, led me into the field of geology.

I was hooked after I spent two weeks at Dinosaur Country Science Camp. My creative energy was tuned to imagining the past: Archaeology, paleontology and, of course, geology had intruded my heart. I have been telling stories of earth science ever since.

I feel lucky to have realized nearly 20 years working and learning in Saskatchewan's wide-ranging geology - field mapping, gold prospecting, exploration and mining and horizontal oil-well drilling before returning to the potash capital of the world.

From Esterhazy, I was raised with a familiarity of what mining is. Potash is certainly a big part of my life. These rocks have been prosperous and provided me with the ability to really learn what our earth has to offer. As I continue to navigate my career, I never miss a chance to satisfy my inner scientist. There has always been something about fossils that really inspires my passion for the past.

My most cherished fossil-find happened in 2014 during the shaft-sinking project at Mosaic Potash in Esterhazy. Involved with the technical geological aspects of the excavation, I was able to examine rocks that had only existed in core boxes in my experience.

My excitement was contagious. I had all kinds of deep-sea monsters and critters arriving on my desk accompanied by questions and a genuine interest in the earth beneath our feet. Finding specimens, evidence of ancient life, was a thrill.

I had an opportunity to really connect science to the job. Recovering things like gryphea (devil's toenail), baculites (walking stick rock) and scaphites was something that I didn't expect. Those names leave a lasting impression.

The best thing about being a geologist is that there is a chance to nurture interest and awe for the amazing world around us. Leave no stone unturned.

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.

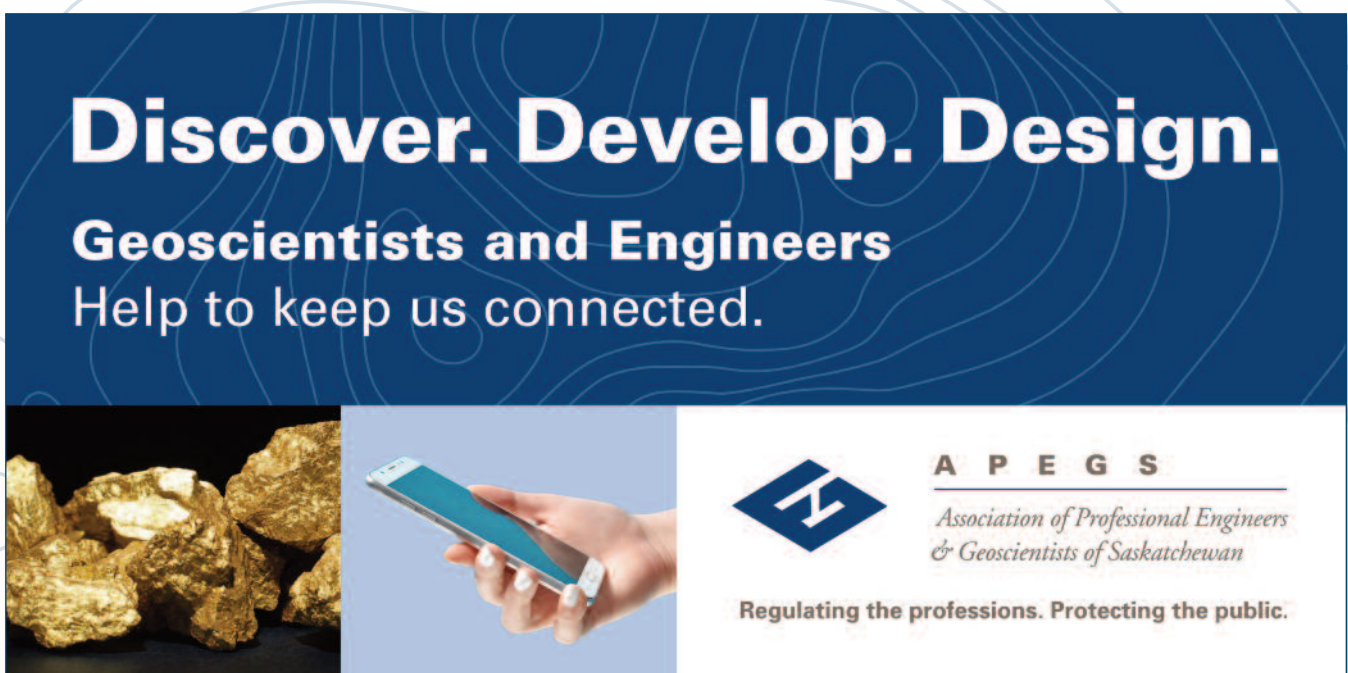
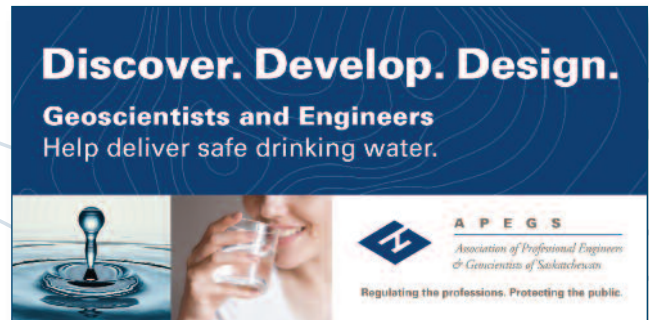
2 SCHOLARSHIPS OF \$3,200
(one for each university) for women in engineering.

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

New APEGS Ads

You may have seen some new APEGS ads this fall. APEGS aired ads online, on the radio (Z99, CJME, C95 and CKOM) and on billboards in the following cities to raise awareness about what engineers and geoscientists do and how they work together: Regina, Saskatoon, Moose Jaw, Estevan, North Battleford, Prince Albert, Swift Current, Weyburn and Yorkton.

The concept for the new campaign builds on the content of the geoscience ads aired in March 2020 to include both professions. The slogan “*Regulating the professions. Protecting the public*” continues to appear with the APEGS logo to reinforce APEGS’ regulatory mandate to protect the public. The ads will appear at scheduled times this fall and then again in spring 2021.



Celebrating Our Own



Wayne Clifton, P.Eng.

Wayne Clifton, whose name is synonymous with geotechnical engineering, is the 2020 recipient of the RF Legget Medal.

The RF Legget Medal is the most senior and prestigious Canadian Geotechnical Society (CGS) award. It is given for significant lifelong contribution to the geotechnical field in Canada.

Wayne grew up in a homesteading family in southern Saskatchewan and completed undergraduate and graduate degrees at the University of Saskatchewan before he took up a prestigious Athlone Fellowship in London. This led to a DIC from Imperial College and an MSc from the University of London.

This busy overseas posting also included a role as a tank commander with the Canadian Armed Forces in Germany.

Wayne worked for the Saskatchewan Department of Highways before starting Clifton Associates Ltd., in 1978. It is the largest independent consulting firm in the province.

Wayne established the current state of geotechnical practice for major crossings of the North and South Saskatchewan rivers and was the first to integrate novel methods of site characterization, hydrogeology and geotechnical analyses into the design and remediation of numerous bridges.

As well, the underpinning of the Saskatchewan Legislature along with remediation of the adjacent Wascana Lake were historic contributions.

Wayne also led numerous development projects in nearly every sector of the mining and energy resource industries of western Canada. Numerous government panels at all levels called on Wayne to provide senior leadership on major environmental, regulatory and research initiatives.

That commitment to the broader community is exemplified by a dedication to the two provincial universities, sports and community organizations and innumerable technical and professional societies.

But the signature mark of Wayne's career has been his life-long commitment in mentoring young geoscientists and engineers. It's a commitment marked by an inexhaustible investment of time and resources that has changed the lives of dozens.

Indeed, Wayne's most enduring contribution is his contribution to people.

Wayne lost his father at an early age and his time with the Canadian Forces provided an opportunity for Wayne to complete his education, but it also put him in the line of duty on several occasions.

This had a lasting impact on many people. The impact of being called to duty is entrenched in Wayne and he sees it as a duty to help others and to enable them.

Wayne has returned the favour of being able to attend university by offering the same opportunity to young people that Clifton Associates Ltd. has employed or engaged over the years.

It's common to hear stories from former and current employees of Clifton Associates of how Wayne would send then-employees back to school to pursue additional education while still receiving a salary.

Wayne's story of enabling and empowering people to grow and to succeed has been a call of duty for him.

Wayne was recognized on Sept. 14 in a ceremony during the 73rd annual CGS conference, GeoVirtual 2020. He will be recognized in person at the CGS/IAH-CNC Awards banquet of the 74th annual CGS conference and 14th joint CGS/IAH-CNC groundwater conference, GeoNiagara 2021.

Wayne's acceptance speech will be published in the December 2020 issue of the CGS member magazine, *Canadian Geotechnique* – *The CGS Magazine*.



THE CANADIAN
GEOTECHNICAL SOCIETY
LA SOCIÉTÉ CANADIENNE
DE GÉOTECHNIQUE

News Beyond Our Borders



ctvnews

B.C. disburses first half of federal funds to reclaim dormant oil and gas wells

The Canadian Press - The first half of a \$100-million federal fund directed at cleaning up dormant oil and gas wells in British Columbia has been disbursed.

Energy Minister Bruce Ralston says work is underway to reclaim wells that have been inactive for at least five years and aren't likely to come back into service.

Applications to receive a share of the second \$50-million instalment opened Nov. 1, which allowed B.C.-based companies to hire local workers to clean up about 2,000 dormant wells.

The program provides up to \$100,000 or 50 per cent of the cost of site cleanup, whichever is less, while Indigenous communities, local governments and landowners may also identify priority sites until the end of this month.

Ottawa pledged \$1.7 billion in April to help Alberta, Saskatchewan and B.C. clean up inactive and so-called orphan oil and gas wells, with B.C. receiving \$120 million.

There are about 7,000 dormant wells in B.C. and 770 orphan wells, meaning the sites were operated by companies that are insolvent, cannot be located or no longer exist.

The \$15-million orphan sites program administered by the B.C. Oil and Gas Commission was flooded with more than 1,100 applications when it launched earlier this year.

Drop in undergrads in oilpatch engineering, geology

CBC - Figures from the University of Calgary show the number of undergraduates focusing on petroleum geology or oil and -gas engineering have dropped significantly since the downturn hit the sector roughly five years ago.

According to figures gathered from the U of C, the number of undergraduate students enrolled with a concentration in petroleum geology declined from 138 in the fall of 2015 to 13 in fall of 2019. That's a drop of nearly 91 per cent.

The ranks of undergrads with a concentration in oil and gas engineering are also down, dropping from 171 to 39 over the same period, or a decline of 77 per cent.

Figures for 2020 enrolment aren't available until December.

The downturn the sector has been navigating since the middle of the decade has affected the number of students enrolling in oil-and-gas-related studies.

The oil and gas industry has been under increasing scrutiny amid concerns about climate change and a growing discussion about a future energy transition.

One area of potential "pickup" at U of C appears to be in energy engineering, with course descriptions focused on renewable aspects of energy. Of note, 134 undergrads had that focus in 2019, compared with 46 in 2015, the year the Schulich School of Engineering launched the new major.

The U of C's faculty of science continues to see enrolment growth across the variety of disciplines offered. Such areas include hydrogeology, natural disasters, environmental geophysics and mining.

Suncor to eliminate up to 15 per cent of staff

Calgary Herald - Suncor Energy announced plans to eliminate up to 15 per cent of its workforce, a move that could affect up to 2,000 jobs in the oil and gas sector.

Calgary-based Suncor — which is one of the country's largest oil and gas producers, with approximately 13,000 employees — confirmed in early October it will reduce its workforce by five per cent in the next six months and by between 10 and 15 per cent over the course of the next year and a half.

The company has been transforming itself in recent years to rely more on data and technology to improve its efficiency, such as using autonomous trucks at its oilsands operations and had anticipated these changes would lead to a smaller workforce.

Suncor Energy cut its capital budget earlier this year by \$1.9



cbc

billion and reduced its prized quarterly dividend in May by 55 per cent. It also scaled back operations at its Fort Hills oilsands mine.

Suncor posted a first-quarter net loss of \$3.52 billion, including a \$1.8-billion non-cash asset impairment charge and then a \$614-million net loss in the second quarter.

Suncor Energy relocating its PetroCanada office

The Canadian Press - Suncor Energy Inc. is moving its PetroCanada head office to Calgary from two offices in Ontario next year, affecting about 700 workers.

A company spokesman says the shift is part of efforts by the oilsands and retail fuel giant to remain competitive by integrating the downstream business with the rest of Suncor to be more efficient.

The downstream operations are largely PetroCanada refineries through to retail and wholesale sales, PetroCanada and Petro-Pass.

Not all positions will move as some need to remain close to customers or businesses, while some employees may choose not to move, says Sneh Seetal, Suncor's director of communications.

Ontario will waste more clean electricity due to COVID-19, engineer group says

The Canadian Press - The amount of clean electricity wasted in Ontario is expected to increase significantly as a result of the changes in energy consumption brought on by the COVID-19 pandemic, according to the association representing the province's engineers.

The Ontario Society of Professional Engineers released an updated analysis today that found Ontario wasted a total of 6.5 terawatt-hours of clean electricity last year, which it says is enough to power 720,000 average-sized homes for a year.

The organization says that's a 12-per-cent increase in wasted electricity compared with 2018 — and it should go up further this year in light of the pandemic.



www.kitchenertoday.com

It says Ontario's electricity system is built to support businesses operating between 9 a.m. and 5 p.m., with a large percentage of homes left idle for at least eight hours a day.

The group says those patterns have drastically changed in the last six months, largely due to shifts in workplace and business operations, leading to an inevitable increase in wasted electricity.

It says while there have been some periods of peak demand, there remain "many, many hours" where surplus electricity is generated and either wasted or exported at low prices.

That represents a "wasted economic and environmental opportunity," the association says.

Surplus hydroelectric, wind, solar and nuclear generated electricity was exported to neighbouring power grids between 2014 and 2019 at prices "much lower than the cost of production," the group says.

The organization recommends the province leverage its excess electricity to displace fossil fuel consumption for heating, charge Ontario's growing fleet of electric vehicles and create clean hydrogen for the industrial sector and hydrogen-powered vehicles.

Canada and US show growing interest in SMRs

Nuclear Engineering International - Canada in late October undertook to support SMR development with funds for Terrestrial Energy. The Canadian government said that, "as a global leader in nuclear energy and nuclear safety, Canada is poised to be a leader in the safe and responsible development of small modular reactor (SMR) technology."

It added: "SMRs are expected to play a key role in Canada's efforts to achieve net-zero greenhouse gas emissions by 2050 and in providing economic benefits as we emerge from the COVID-19 pandemic."

Minister of Innovation, Science and Industry Navdeep Bains announced a \$20-million investment that will enable



www.neimagazine.com

Ontario-based Terrestrial Energy “to take a critical step toward commercialising its cutting-edge SMR technology, creating significant environmental and economic benefits for Canada.”

The contribution is being made through the Strategic Innovation Fund (SIF), a program designed to attract and support high-quality business investments across all sectors of the economy.

The investment will help Terrestrial Energy to complete a key pre-licensing milestone through the Canadian Nuclear Safety Commission to assess the acceptability of the Generation IV technology that the company is developing as part of its \$68.9 million Integral Molten Salt Reactor project.

Ontario Power Generation is also advancing engineering and design work with three grid-scale SMR developers: GE Hitachi, Terrestrial Energy and X-energy.

Engineers urged to design to support policy goals

Journal of Commerce - Federal Minister of Infrastructure and Communities Catherine McKenna made it clear during a recent address to engineers that the government will be using a tightly focused policy lens when it spends on infrastructure in future.

McKenna told members of the Association of Consulting Engineering Companies – Canada (ACEC) during its annual general meeting that every dollar spent on infrastructure must target such goals as fighting climate change and boosting inclusivity.

“We need to make sure every dollar spent has multiple benefits,” she said. “It’s about jobs in the short term and economic growth in the long term. It’s about tackling climate change and a more resilient future. And it is also about inclusivity, and that is an area where we need your support.”

McKenna urged engineers to “think hard” as they designed projects: “How do we get those multiple benefits? How do we get women not only into consulting engineering but also into construction and broaden the diversity? There are huge opportunities for jobs.”

The Ottawa MP outlined the three pillars of federal government infrastructure spending: the 12-year, \$180-billion Investing in Canada Infrastructure Plan (ICIP) is said to be directly intended to put sustainability at the forefront of project planning; the COVID-19 Resilience stream provides \$3 billion in accelerated ICIP funding; and the new \$10-billion Canada Infrastructure Bank Growth Plan also contains a notable focus on green infrastructure.

The COVID resilience stream, McKenna admitted, would be slow off the mark in terms of providing immediate stimulus because the government is still working to secure revised ICIP agreements with some provinces and territories.

McKenna referred to a recent study indicating that every \$10 billion spent on infrastructure creates 75,000 jobs.

“I need you to be part of this,” she told ACEC members. “I need everyone to be part of this. Obviously consulting engineers know how critical building good infrastructure is to our country, to our people, to our prosperity, to our long-term growth and well-being. And we need to make the case constantly to Canadians.”



Alberta announces Mineral Advisory Council

The Canadian Press - The government of Alberta announced a five-member panel that will work to help the province become a world leader in mineral resource production.

The Mineral Advisory Council will help the province unlock Alberta’s vast, untapped geological potential for various minerals that are in increasing demand globally.

These minerals include lithium, vanadium, uranium, diamonds, potash and rare earth elements. Many of these are used to manufacture items such as batteries, cell phones and energy storage cells.

In addition to the work to be done by the council, the government will engage with key stakeholders to gather input on the elements of a successful mineral strategy.

This includes improving public access to quality data about mineral occurrences in Alberta, having a streamlined regulatory environment in place that assures environmentally responsible development, enhancing opportunities for Indigenous Peoples, promoting innovation and attracting investment.

Natural resources suffers ‘steepest decline ever’

Postmedia News - Canada recorded its largest ever drop in natural resources employment in the second quarter, as the COVID-19 pandemic caused commodity prices to plummet. Nearly 43,000 workers lost their jobs.

Statistics Canada reported employment in the natural resources sector fell 7.3 per cent, which is “the steepest decline ever recorded” as “low natural resource prices contributed to broad-based job losses.”

StatsCan also reported the resource sector’s contribution to the country’s gross domestic product declined, while exports fell 9.3 per cent due to a collapse in commodity prices.

The energy industry felt the brunt of the job losses, with 23,600 workers losing their jobs, followed by 11,850 jobs lost in the mining and minerals industry. A further 6,100 jobs were lost in the forestry sector and 1,400 jobs were lost in hunting, fishing and water industries. Altogether, there were 42,950 people out of work in those natural resources businesses in the second quarter.

StatsCan data shows natural resources represented about 8.4 per cent of the country’s nominal GDP in the second quarter, which is down 9.5 per cent from the first quarter. This was the sharpest quarter-over-quarter decrease since the agency first started reporting quarterly data in 2007.

A recent report by Calgary-based ARC Energy Institute notes that reinvestment in the oil and gas sector will fall to \$9.5 billion this year, compared to \$25.3 billion in 2019 — 64 per cent drop. The institute expects the sector’s revenues to reach \$69.3 billion this year, a 42.6 per cent drop from last year.

Searching for innovative ways to promote STEM to Indigenous students

University of Ottawa – According to Statistics Canada, Indigenous people account for less than two per cent of STEM positions.

Outlined in the Indigenous Resource Center’s (IRC) 2019-2024 Indigenous Action Plan is the University of Ottawa’s plans to integrate Indigenous knowledge and representation into all areas of the university. One area of focus is Science, Technology, Engineering and Mathematics (STEM).



Focusing on finding innovative ways to have more Indigenous representation in STEM is the IRC’s next priority. The IRC has focused its attention on encouraging more Indigenous students to pursue degrees in this field.

“We have worked with Let’s Talk Science and the Verna J. Kirkness Science and Engineering Program in the past to offer programming that promotes STEM and encourages Indigenous youth to consider it as a field of study, but it’s an area where our people are underrepresented,” said Jerome Lanouette, director of Indigenous affairs.”

STEM promotion in high schools is a way Lanouette hopes to boost representation.

“A lot of our Indigenous students are underrepresented in STEM. But some of the targeted recruitment that we want to move forward on in [the] next upcoming year or two is focusing on high school students that have that drive to become an engineer.”

ACEC-NB highlights need for more female engineers

Daily Commercial News — A report by the Association of Consulting Engineering Companies of New Brunswick (ACEC-NB) makes the case for the need to attract more women to the consulting engineering sector and retain those who are currently working in the profession.

The report, *Women in Consulting Engineering in New Brunswick: Career Satisfaction and Workplace Experiences*, was developed by the ACEC-NB’s Diversity and Inclusion Committee based on research and surveys conducted throughout 2019.

Some of the report’s key findings include:

- Men currently outnumber women in the field by four to one.
- Only 35 per cent of companies surveyed track labour statistics. Even fewer, 17 per cent, track the number of women promoted.
- None of the employers surveyed track the number of women interviewed as part of the hiring process.

Mentorship is said to be a key influencer to a positive work culture for women, with 86 per cent of respondents



indicating that it supports their professional growth and would like to see more of it.

When asked if they are motivated to work in management or executive roles within their organization, 67 per cent of survey respondents said yes. However, more than 30 per cent of early career starters were unsure of the path, pointing to a potential for employers to cultivate this talent by demonstrating clearer paths to advancement and investing in mentorship to prepare women for succession and the management ranks.



Feds invest \$10 billion in infrastructure

The Canadian Press – In early October, Prime Minister Justin Trudeau outlined how the Canada Infrastructure Bank intends to invest \$10 billion in projects meant to create 60,000 jobs and contribute to the fight against climate change.

The list does not include specific projects — or any new money — but highlights priority areas in which the bank intends to invest.

That includes \$1.5 billion for agricultural infrastructure in Western Canada and \$2 billion for broadband to expand access to high-speed internet service across the country.

It also includes \$2.5 billion for clean power, \$1.5 billion for zero-emission buses and \$2 billion to retrofit buildings for energy efficiency.

The announcement includes \$500 million to help speed up

the things that need to be done before starting construction, such as studies and technical reports.

It is also intended to help the government meet its goal of net-zero carbon emissions by 2050.

Trudeau’s government launched the infrastructure bank in 2017 with the authority to spend \$35 billion over 10 years.



Alberta hoping to tap into promising future of hydrogen energy

The Canadian Press - The Alberta government says it is getting out of the natural gas industry’s way via a new plan to bolster the sector.

Officials launched what they called the “natural gas vision and strategy,” which aims to see Alberta export hydrogen globally by 2040, become one of the world’s 10 largest petrochemical producers and tap into the Asian and European markets with liquefied natural gas projects within 10 years.

With stores of about 300 years of natural gas at current usage rates, Associate Minister of Natural Gas and Electricity Dale Nally said the plan will leave Alberta positioned as “a post-pandemic powerhouse for responsible energy production.”

The announcement was made at ATCO’s heavy equipment repair depot and natural gas site in southeast Edmonton Tuesday afternoon.

Next year, the company will build a site in Fort Saskatchewan to blend clean-burning hydrogen into its natural gas distribution system, effectively “decarbonizing heat,” ATCO CEO Nancy Southern said.

Hydrogen can be extracted from water, fossil fuels and biomass, or a combination of the two. According to the International Energy Agency, natural gas constitutes 75 per cent of 70 million tonnes of hydrogen produced around the world annually.

The Hydrogen Council estimates hydrogen as an energy source has the potential to become a \$2.5-trillion industry by 2050.

News From The Field

AGRICULTURE



AITC finding new ways to engage students

Moose Jaw Today - Agriculture in the Classroom (AITC) is hardly taking a break this year because of COVID-19, as the non-profit organization has a number of new programs up its sleeve to help bring agriculture to classrooms across Saskatchewan.

As an organization, AITC is dedicated to connecting students and teachers with the many facets of the agriculture industry, usually through hands-on, in-person programming like farm tours, interactive events, classroom presentations and the annual Food Farm program every spring.

But this year, the organization is focusing on reworking its educational materials for teachers to implement themselves in their classrooms, thanks to the pandemic and public health restrictions.

A lot of the organization's programming has moved online, with resources and activities available to teachers and homeschooling parents. But AITC is still working to provide more than just online lessons, as the organization finds interactive methods are the best way to demonstrate agriculture in action.

Programming is focusing on a more individual nature, like the Little Green Thumbs and Little Green Sprouts programs that are continuing this year, and activity kits for students that avoid group work.

It was important for AITC to adapt programming for this year, so they could continue exposing young students to the different aspects of agriculture and the industry.

"Lots of students will say, 'Oh, I want to be an engineer,' and they can be an engineer in agriculture. They can be a lawyer and work in the field. If they're interested in biology, there is a tremendous opportunity to work right here in Saskatchewan and be on the forefront of some cutting-edge technology," said AITC executive director Sarah Shymko. "So, we're hoping that with our inquiry-based and hands-on resources, we're helping kids to become critical thinkers and view agriculture through a positive lens."

CONSTRUCTION



Local contractors encouraged to expand skill set

Meadow Lake Now - An Alberta-based company has been working on a 21-kilometre stretch across Highway 4 south heading toward Glaslyn.

Ministry of Highways and Infrastructure spokesperson Steve Shaheen said there are not many local companies who are skilled with seal coat application and is encouraging local contractors to get involved.

"At the present time, there are no Saskatchewan contractors that can do engineering seal work. However, priority Saskatchewan has been set up by SaskBuilds to help with the development with Saskatchewan suppliers," Shaheen said. "Their efforts might encourage a local company to get into this line of work."

The Ministry uses the best-value procurement model for construction contracts which considers safety, price, experience among other factors.

The seal coat project underway is being constructed by West-Can, an Alberta-based company with some Saskatchewan roots. While

the provincial government recognizes the need to support Saskatchewan-based contractors and employers in the reopening of Saskatchewan, the ministry recently updated its procurement to include a community benefit Saskatchewan section.

ELECTION



www.saskndp.ca/ritchie

Environmental engineer wins Nutana riding

CTV News - Saskatchewan NDP's Erika Ritchie, P.Eng., was elected in the Saskatoon Nutana riding.

Ritchie received 61 per cent of the vote and defeated Saskatchewan Party candidate Kyle Mazer and Green Party candidate Albert Chubak.

Ritchie is an environmental engineer and sustainability business consultant with E.S. Ritchie Consulting. She has worked to prioritize environmental protection and sustainability in resource development.

Ritchie received a Bachelor's degree in chemical engineering and a Master's degree in environmental engineering from the University of Saskatchewan.

ENERGY



www.producer.com

New Holland Agriculture goes green with solar panels at Saskatoon facility

CTV News - A Saskatoon-based agriculture company is now home to 1,000 new solar panels.

CNH Industrial partnered with the Saskatchewan Environmental Society (SES) Solar Co-operative to get the array of solar panels.

More than a year in the making, the panels will yield 400 kilowatts of power for the New Holland Agriculture facility. The solar panels will produce enough energy to power 70 households.

The panels were installed by MiEnergy and took one month to complete. The panels were a step in the company looking to go greener.

CNH Industrial says they are working towards reducing their carbon footprint and installing solar panels was a good start.

The panels purchased for Solar Co-op's newest project will reside on the New Holland Agriculture site producing renewable energy for their operations and generating a return for SES Solar Coop shareholders through lease payments.

CNH Industrial says that for the 25 years they have these panels leased, they will offset eight per cent of their total energy consumption off grid with non-renewable energy sources.

MINING



www.mining.com

Potash produced in environmentally friendly way

Mining.com - A Saskatchewan company developed a new, environmentally friendlier mechanism to produce potash without generating salt tailings and requiring no surface brine ponds.

According to Saskatoon-based Gensource Potash, the absence of tailings eliminates decommissioning risks, while not having ponds removes the single largest negative environmental impact of conventional potash mining.

The extraction method Gensource created injects a hot salt (NaCl) brine into horizontal caverns in the ore body, which selectively dissolves potash, (KCl) leaving salt in place. The KCl-rich brine is then processed (KCl 'drops out' through cooling crystallization) and the NaCl brine is reheated and re-circulated back to the cavern to repeat the process.

The process is carried out by a series of independent production facilities that are a fraction the size of a traditional potash project and can produce between 250,000 – 300,000 t/year of the fertilizer.

Set to be installed at the Tugaske project, which is within the company's Vanguard Area in south-central Saskatchewan, the modules are said to use 75 per cent less water per tonne of potash than conventional solution mining methods. They also have the ability to use brackish water sources, which reduces freshwater usage even further.

Gensource also reported that power at Tugaske is self-generated using natural gas, not coal, which avoids up to 24,500 tonnes/year CO₂e of emissions.



Explorers targeting Sask's diversified mineral prospects

Resource World - Saskatchewan is the largest exporter of agri-food products in Canada. However, it is also notable for hosting a variety of mineral resources and even heat for a new geothermal plant.

Saskatchewan has approximately half of the world's potash reserves and eight per cent of the world's recoverable uranium reserves. The Athabasca basin of northern Saskatchewan has the world's highest-grade uranium mines. Its 2019 production of 18 million pounds of U₃O₈ are being used in Canada and globally to generate some 306 billion kilowatt hours of electricity which is equivalent to powering about 28 million homes with an almost zero carbon footprint – and there is a great deal of uranium yet to be discovered and to mine.

It is actually astounding how much electricity nuclear power generates. The largest offshore windfarm in the world (Walney in Irish Sea) generates less than two Mw per square kilometre. The largest nuclear power plant in world (Kashiwazaki-Kariwa in Japan) generates 1,955 Mw per square kilometre.

Global demand for electricity is expected to grow 76 per cent by 2030, plus the increasing power usage through charging electric vehicles. The world is going to need a great deal of uranium as there are 442 current operable reactors, 54 reactors under construction, 439 reactors ordered, planned and proposed which could lead to a uranium shortage.

In addition, Saskatchewan has deposits of gold (La Ronge Gold Belt), coal, diamonds, platinum, palladium, rare earth

elements, copper, zinc, nickel, sodium and potassium sulphates and mineralized brines. Saskatchewan mineral sales totalled \$7.3 billion in 2019.

Mining companies directly contributed approximately \$1.8 billion in provincial, federal and municipal taxes to government in 2017 while providing more than 30,000 jobs.

It has been estimated that between 2008 and 2028 the Saskatchewan mineral industry will invest over \$50 billion in expansions and new mines.



Protecting Saskatchewan lakes from contamination

University of Saskatchewan - Using the Canadian Light Source synchrotron, a University of Saskatchewan-led research team developed a method for monitoring uranium contaminants in mine tailings using samples from McClean Lake.

Numerous researchers have studied the chemistry of nickel, arsenic, selenium and molybdenum in Orano Canada's tailings management facility at McClean Lake, but to date little was known about residual uranium. One of the challenges has been the extremely low concentrations of the element left after processing at Orano's ore mill, which began operating in 1997.

Now researchers at USask and Orano Canada have developed a method for determining precisely where uranium is located in the McClean Lake tailings and its chemical form. The findings were published in the *Journal of Spectroscopy and Related Phenomena*.

Orano and other mining companies take the novel methodology this team has developed and tailor it to answer questions they have about the impact of their operations.

The researchers used a technique called X-ray microprobe which involves focusing a beam of light on the sample to "excite" the chemical elements that are present. When they are stimulated by the energy in the light, the elements emit X-ray fluorescence (XRF) signals that can then be captured in an image similar to a heat map, showing where they are situated.

USask chemistry researcher Arthur Situm, lead author on the team's recently published paper, says a challenge their team had to overcome is that XRF signals emitted by potassium overlap with those given off by uranium — making it difficult to pinpoint the exact location of the uranium in a sample.

The team had a breakthrough when they identified the precise energy that excites the uranium in the McLean Lake tailings sample without also exciting the potassium, which is present in far greater concentrations.

Using a technique called XANES at the CLS, the team was subsequently able to confirm that their method accurately identified the location of uranium in the tailings. The researchers also used XANES to determine the chemical form of the uranium, a first for the McClean Lake facility.

OIL AND GAS



Sask banks on abandoned well cleanup

National Observer - Saskatchewan is putting more money into fixing abandoned oil wells, a move it says will boost economic recovery by getting oil and gas sector workers back on the job.

The government will allocate \$100 million in federal funding for eligible oil and gas operators who collaborate with Saskatchewan-based companies in the first stage of its plan to retire wells and facilities that are no longer viable. To date, the province has approved \$34 million worth of work packages for abandonment and reclamation work on inactive wells and other facilities.

The funding represents phase one of Saskatchewan's Accelerated Site Closure Program (ASCP), which launched in May, with the first approved projects announced in July.

The government said the Saskatchewan Resource Council (SRC), along with SaskBuilds, is providing procurement expertise to ensure Saskatchewan-based service companies are used.

As many as 8,000 inactive wells and facilities are expected to be abandoned and reclaimed over the life of the program, which is expected to support some 2,100 full-time equivalent jobs.

There are currently 11 operators and more than 100 service companies involved in the approved work packages, which are evenly distributed across the province's four major oil-producing regions.

RESEARCH



Canadian Light Source synchrotron working towards upgrade to '2.0'

CBC Saskatchewan - Toby Bond says it's a common misconception that the massive machine where he works in Saskatoon could create a black hole, but he's not denying the night shift at the particle-accelerator facility can feel like being in a science fiction movie.

"It's a strange place to be overnight," said Bond, an industrial scientist at the Canadian Light Source synchrotron in Saskatoon. "If you happen to doze off and wake up, you kind of feel like you woke up on a spaceship and that you were, you know, abducted in the middle of the night or something."

More than 3,000 experiments have been completed at the facility. It has been used to examine the effects of acid rain on spider's silk, to find the cause of missing teeth in a Bronze Age skull, to see inside the rib of a tyrannosaurus rex and look at the chemistry of soil. It has also helped scientists develop various methods of cancer treatments.

It helps researchers look inside objects at a level of detail not possible using a traditional X-ray or high-powered microscope.

At the end of each beamline, which branches off a stop-sign shaped ring used to produce the light, there is a place to put the object that is being examined.

"If you walk across the beamlines and talk to all the people who are using them on any given night, you'll run into a physicist, a chemist, a biologist, medical researcher and engineer, a geologist," said Bond.



SaskTel, USask collaborate to support innovation

University of Saskatchewan - SaskTel and the University of Saskatchewan (USask) are partnering to launch a living laboratory at the university's Livestock and Forage Centre of Excellence (LFCE) to test, develop and demonstrate world-class agricultural technologies.

Through a Memorandum of Understanding (MOU), SaskTel and USask will focus on smart farming research and innovation to accelerate transformation in Saskatchewan's agriculture industry. Smart farming involves collecting and analyzing big data so that producers can make informed and sustainable farm management decisions that improve productivity.

This initiative — driven by engineering, agriculture and computer science researchers — will focus on conducting research, improving education around Smart Farming and testing and validating new ag-tech ideas and solutions.

The LFCE would be the first research Smart Farm in Canada focused on maximizing efficiency in livestock operations through the latest Internet of Things-based technology in an interconnected wireless environment.

Terry Fonstad, Ph.D, P.Eng, FEC, associate dean research and partnerships with the USask College of Engineering, said the MOU underscores the commitment LFCE has made to livestock producer groups to serve as a powerhouse for innovative research and teaching that will improve livestock production in Canada and around the world.

"The MOU brings together new knowledge and applied research at USask in areas of strength in engineering, agriculture and computer science with the infrastructure and expertise at SaskTel to advance agriculture," Fonstad said.

Engineering grad student recognized globally for academic and humanitarian accomplishments

University of Regina - A University of Regina postgraduate has been recognized as one of the world's best electronic engineering students by the Institute of Electrical and Electronic Engineering (IEEE) Power & Energy Society (PES).



Usman Munawar

Usman Munawar, a masters of electronic systems engineering student in the Faculty of Engineering and Applied Sciences, recently was awarded a 2020 IEEE PES Outstanding Student Scholarship. From a global pool of more than 10,000 student members, Munawar was one of the five recipients of the scholarship and the only student from Canada.

Originally from Pakistan, Munawar completed his Bachelor of Science in Electrical Engineering from COMSATS University Islamabad, Lahore Campus and worked as a Senior Research Officer/Adjunct Lecturer at the KICS University of Engineering and Technology in Lahore.

When deciding where to complete his masters, Munawar was drawn to Regina based on the research interest he shared with the U of R's Dr. Zhanle Wang. He was impressed by the reputation of the U of R's electronic systems engineering program.

Since arriving at the U of R, Munawar has become president of the Engineering Graduate Students' Association, earned a 4.0 grade point average, received a MITACS Research Training award, had 12 journal and conference publications and has travelled around the world to present technical talks and research. He also volunteers with the University of Regina Faculty Association as a sessional committee member and has organized 10 technical engineering activities around campus.

Through IEEE, Munawar has completed humanitarian work including a Smart Village project in Nepal, helping to bring electricity to off-the-grid communities. He has also given back in his native Pakistan, setting up a smart computer lab for K-12 students.

USask welcomes newest Schulich Leaders

Yorkton This Week - Arliss Sidloski, a graduate of Weyburn Comprehensive High School, is among the University of Saskatchewan (USask) recipients of the Schulich Leader Scholarship.

www.uregina.ca



Arliss Sidloski

Sidloski, 18, is a recipient of the \$100,000 Schulich Leader Scholarship. Sidloski entered the College of Engineering this fall.

Sidloski was selected for her outstanding academic achievements in science and her community work to

support children with special needs. In 2019, she helped start an all-abilities soccer program and was captain of her high school soccer, basketball and cross-country teams.

Sidloski said she's excited to learn about the different aspects of engineering in the coming years, and this summer, joined the University of Saskatchewan Space Team to design and prepare a cube-satellite for orbital launch in late 2021. It will be Saskatchewan's first satellite in space.

"It is humbling to be honoured with the prestigious Schulich Leader Scholarship and join the community of other high achieving award recipients," said Sidloski. "I am filled with gratitude that Mr. Schulich and his foundation have provided me with this opportunity."

Through the Schulich Foundation, these entrance scholarships are awarded to 100 high school graduates this year, enrolling in a science, technology, engineering or mathematics (STEM) undergraduate program at 20 partner universities in Canada, including USask.

"Schulich Leader Scholarships are the premiere STEM scholarship program in Canada and the world," said Schulich. "With their university expenses covered, they can focus their time on their studies, research projects, extracurriculars, and entrepreneurial ventures. They are the next generation of entrepreneurial-minded technology innovators."



engineering.usask.ca

Engineering made-in-Saskatchewan solutions

University of Saskatchewan – When a shift begins in a potash mine, the first man to enter the massive underground room where work is taking place does something that might seem strange to the average person.

He bangs the roof with a long iron bar. And listens.

The sound that returns to his ears tells him something crucial to the safety of his team: Either the roof is safe, or it is not.

"If you hit any hollow parts, it's very easy to hear," explains Craig Funk, B.Eng, M.Sc, director of geo-services and land for Nutrien, the international mining and agricultural products giant. "You can tell right away; it's a very definitive sound.

"What happens at that point is the person sounding will mark the area and we will deal with it by scaling the rock down or putting in rock bolts. This tool has probably been around since mining began. It's one of the oldest tools out there."

While it's unlikely potash mines would ever do without this simple but highly effective tool, Nutrien wondered if a digitized version could be created.

Enter Travis Wiens, M.Sc., Ph.D., P.Eng., associate professor of mechanical engineering at the University of Saskatchewan. With financial support from the International Mineral Innovation Institute (IMII), he has started a research project to find a solution.

"We had a student who went underground and essentially took a scaling bar, a two-to-three-metre iron bar and he banged it off the roof and recorded the sound," Wiens said. "He did that 3,000 times at five different mine sites. We have a large library of these recordings, and at the same time, there was an experienced miner there who told him whether it was a stable roof or an unstable roof. So, we have a large library of recordings that have been labelled as safe or potentially unsafe."

"We put (that data) into some machine learning algorithms and asked (them) to try to predict whether the roof would be safe or unsafe or unknown. We're in the research stage right now; the product development will come next."

Funk says the digitized sounding bar "could be very helpful, say, in robotic situations. We have travel ways underground that have been there for 30 years. We have to regularly inspect those. The roofs could be 18, 20 feet high and difficult for a person to sound.

"There's a variety of applications. The sky's the limit. You could incorporate it onto machines; as the machine is moving along, it's sounding."

It's just one project Wiens has undertaken for Nutrien, and it demonstrates the collaborative approach to innovation he's taking with the mining industry.

Calendar Of Events

Government of Saskatchewan – Employment Standards Training Webinar (5 of 10)

January 6, 2021

<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

LEED GREEN Associate (GA) Training - Webinar

January 16, 2021

<https://leadinggreen.com/webinars/>

Government of Saskatchewan – Employment Standards Training Webinar (6 of 10)

January 20, 2021

<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Government of Saskatchewan – Employment Standards Training Webinar (7 of 10)

February 3, 2021

<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

LEED GREEN Associate (GA) Training - Webinar

February 6, 2021

<https://leadinggreen.com/webinars/>

Government of Saskatchewan – Employment Standards Training Webinar (8 of 10)

February 17, 2021

<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

APEGS Spring PD Days

Various webinars throughout the month of March
www.apegs.ca

Government of Saskatchewan – Employment Standards Training Webinar (9 of 10)

March 3, 2021

<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Deadline to Register for the APEGS Spring 2021 Law & Ethics Seminar and Professional Practice Exam

March 12, 2021

<https://www.apegs.ca/Portal/Pages/Professional-Practice-Exam>

Government of Saskatchewan – Employment Standards Training Webinar (10 of 10)

March 17, 2021

<https://www.saskatchewan.ca/business/employment-standards/employment-standards-training>

Did You Know?



Reading *The Professional Edge* counts as credits for reporting continuing professional development under the Informal Activity Category.

Attending conferences also counts as credits under the Informal Activity category. For more information visit apegs.ca under the CPD menu.