APEGS
Association of Professional Engineers & Geoscientists of Saskatchewan

THE PROFESSIONAL EDGE

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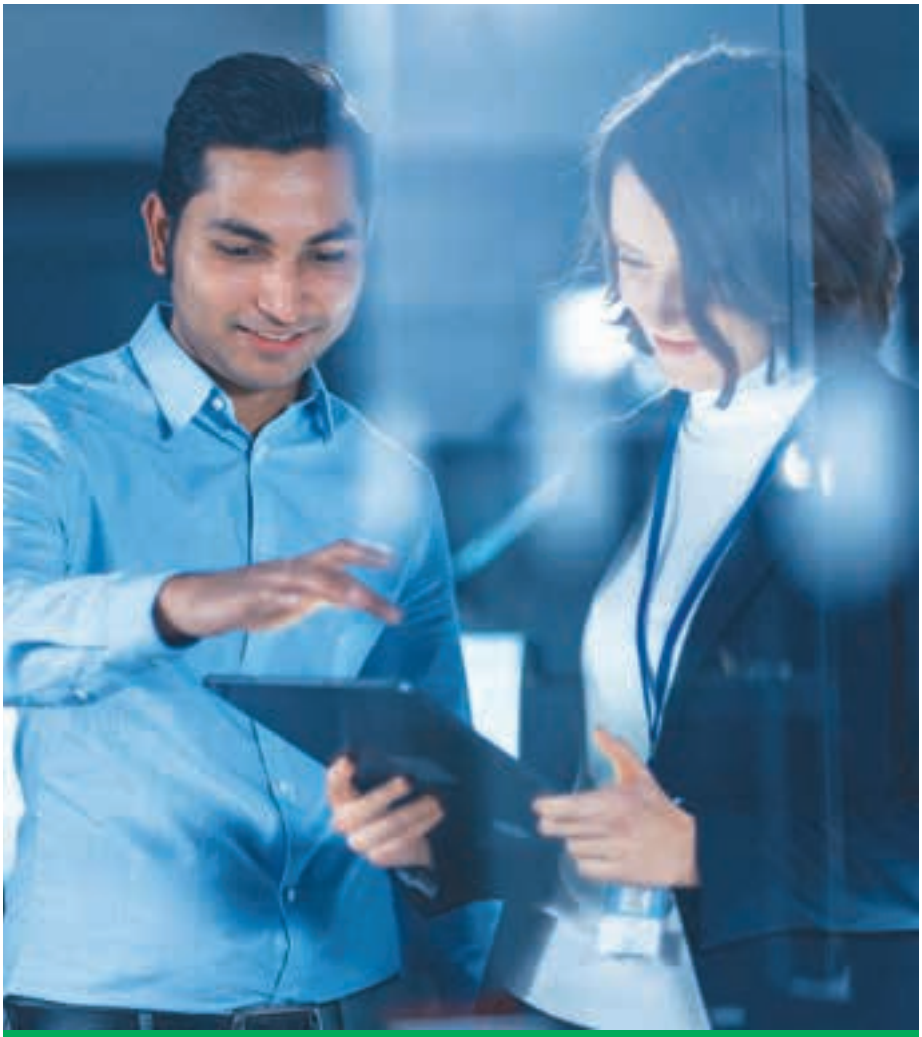
APEGS 2021 AWARDS

91ST ANNUAL MEETING AND PROFESSIONAL DEVELOPMENT CONFERENCE



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MAY/JUNE 2021

91ST APEGS ANNUAL MEETING AND PROFESSIONAL DEVELOPMENT CONFERENCE

Clarification is needed to address an article that appeared in issue 191 of *The Professional Edge*. The petrified wood found in Grasslands National Park was not taken from the park, as it is illegal to do so. Geology.com also was a source for the article. *The Professional Edge* regrets any confusion this caused.

President's Message

Kristen Darr, P.Geo.

As I focus on writing my first President's Message and highlighting the APEGS 91st Annual Meeting and Professional Development Conference, I must first take the opportunity to thank Past-President Drew Lockwood, P.Eng., FEC, FGC (Hon.).

In an unprecedented year of challenges and unknowns, Drew led the association with a positive and steady outlook and always leveraging engaging humour at just the right moments. In Drew's words, the "peaceful transfer of power" occurred on May 1, 2021 at the annual meeting.

A huge thank you goes out to the entire APEGS staff and so many tireless volunteers who pulled off such a successful virtual annual meeting and a well-attended professional development week leading up to the AGM.

Our professional development conference had approximately 379 members who attended professional development opportunities throughout the week. As much as we are all looking forward to the days when we can hold such events face to face again, there is no doubt APEGS will continue to look for opportunities to engage with members virtually, allowing a broader participation in our events.

As usual, the professional development opportunities at this year's conference were excellent. With the opportunity to attend online keynote addresses or track sessions that included ethics, self-regulation or future energy opportunities in Saskatchewan, there was something for everyone.

The annual business meeting had a a good turnout with 186 voting members in attendance. The membership passed some significant bylaws, including the reduction in council size and changes to the council nomination process.

The ratification of some core bylaw changes allows APEGS to move forward with implementation of outcomes from the Governance Change Project over the coming year. This implementation will be a key focus area for staff, council and many volunteers in 2021 and I look forward to continuing the work that began over a year and a half ago.

In many ways, the heavy lifting has been done and focus will turn to planning and implementation. I expect the year ahead to be another busy year as we work through change, with the anticipation of the accomplishments and value that will be delivered at the end of the project.

APEGS is well on its way to a more modernized governance structure which will increase APEGS' transparency and the public's confidence in APEGS' role of self-regulation and public protection in Saskatchewan.

Congratulations and welcome to the new councillors. You are coming in at an exciting time and the knowledge and engagement you will bring will have an impact on the association well into the future. To the returning councillors, I value each of your perspectives and enthusiasm as we lead through change.

Congratulations and a thank you to Shawna Argue, P.Eng. FEC, FGC (Hon.), Director of Registration, who will be retiring from her staff role at APEGS at the end of May. Shawna has been instrumental in so many areas for the association and will be dearly missed. However, as a past-president, we know Shawna will not be able to get too far or stay away for too long.

I look forward with excitement and hope to serve as APEGS' president this year, engaging with our volunteers, members and many stakeholders as we set our sights on a return to normal. I thank you for the opportunity to serve.

P.S. – As a P.Geo., I want to give a personal acknowledgement to the profession and congratulate Geoscientists Canada on its 25th anniversary *(refer to page 15)*.

Report on the 91st APEGS Annual Meeting and Professional Development Conference

The Engineering and Geoscience Professions Regulatory Bylaws requires that the annual meeting of the Association of Professional Engineers and Geoscientists of Saskatchewan be held in the first six months of each year.

Customarily, APEGS holds the annual meeting each year on the first Saturday in May preceded by a professional development conference the day before (several sessions are featured on pages 9-21) and a banquet for the recipients of the APEGS awards on Saturday evening (see pages 24-31 for more).

The 91st Annual Meeting of the Association was called to order virtually at 9 a.m. on Saturday, May 1, 2021, with 186 voting members in attendance.

The business of the meeting included:

- Minutes from the 2020 Annual Meeting.
- Business arising out of the minutes.
- Reports from committees.
- Audited financial statements.
- New business:
  - Including seventeen bylaw amendments.
  - One motion from the floor.
- Report of the scrutineers.
- Council Induction.

Each year, APEGS engages an independent third-party research firm to conduct council elections on the 20th day before the date fixed by the council as polling day. APEGS engaged Insightrix Research Inc. to conduct the 2021 council elections. Insightrix issued ballots on March 29, 2021 and polling day was April 19, 2021.

The Executive Director and Registrar reported the total number of votes cast was 2,106 (2,070 electronic, 36 mail) being 14.8 per cent of the 14,258 total ballots sent out. There were two spoiled ballots.

The results of the vote were:

Officers of Council – one-year term

- President – Kristen Darr, P.Geo.
- President-Elect – John Desjarlais, P.Eng.
- Vice-President – Greg Vogelsang, P.Eng., P.Geo., FEC, FGC

New councillors – three-year term

- Group II (Mechanical & Industrial) – Ashok Thakkar, P.Eng., FEC
- Group V (Agriculture and Forestry) – Carolyn Emperingham, P.Eng.
- Southeast District – Trent Nelson, P.Eng.
- Geoscience South District – Gavin Jensen, P.Geo.
- Members-in-Training – Caileigh Beckman, Engineer-in-Training

Returning members of Council

- Andrew Lockwood, P.Eng., FEC, FGC (Hon.) – Past President
- Nicholas Kaminski, P.Eng. – Group I (Civil)
- Kaylee Tumack, P.Eng. – Group III (Electrical and Engineering Physics)
- Erin Moss Tressel, P.Eng., P.Geo, FEC, FGC – Group IV (Geological, Mining, Petroleum, Geophysics and Geoscientists)
- Patricia Lung, P.Eng. – Group VI (Chemical, Ceramic and Metallurgical)
- Danae Lemieux, P.Eng. – Group VII (Environmental)
- Aaron Phoenix, Ph.D., P.Eng., FEC – Southwest District
- Ian Farthing, P.Eng., FEC – North District
- Alix Cruickshank, P.Geo. – Geoscience North
- Wendell Patzer – Public Appointee

Andrew Lockwood, P.Eng., FEC

Presidents' Message Available Online

In this three-minute video, President Kristen Darr, P.Geo., and Past President Andrew Lockwood, P.Eng., FEC, FGC (Hon.) look back on achievements of 2020-2021 and what they look forward to in 2021-2022.

Visit apegs.ca under 2021 Annual Meeting and PD Conference or check out e-Edge under About Us / *The Professional Edge*.

Kristen Darr, P.Geo.

New Officers of Council and New Councillors

President

Kristen Darr, P.Geo.

University Education: University of Victoria, Bachelor of Science in Geography and Environmental Studies, 2002.

Prior APEGS Involvement: Served as the Geoscience South Councillor and is on the Governance Change Project Steering Group. Vice-President for 2019-20 and President-Elect for 2020-21.

Current Employment: Director, Environment and Sustainability with SaskEnergy in Regina.

Personal Interests: Spending time with family and friends, camping, attending Saskatchewan Roughriders games and just being outdoors. She is an avid downhill skier and loves to see her kids excelling in the sport.

President-Elect

John Desjarlais, P.Eng.

University Education: University of Saskatchewan Edwards School of Business, Master's in Business Administration, 2015; University of Saskatchewan, Bachelor of Science, Mechanical Engineering, 2011; SIAST, Certificate in Radiation and Environmental Monitoring, 2001.

Prior APEGS Involvement: Served on K-12 Committee, Professional Development Committee, Equity and Diversity Committee, Indigenous Sub-committee, Education Board. North District Councillor from 2017-20. Vice-President for 2020-21. Currently on the Governance Change Steering Group.

Current Employment: General Manager of Great Plains Contracting.

Personal Interests: Acting as a mentor and role model, serving the community in a variety of capacities, including serving on committees and boards. Most of all, creating everlasting memories with his family through travel and exploration of the world's beauty.

Vice-President

Greg Vogelsang, P.Eng., P.Geo., FEC, FGC

University Education: University of Regina, B.Sc. in Geology, 1988; Northern Alberta Institute of Technology, Resource Engineering, 1982.

Prior APEGS Involvement: Served as Geoscience South Councillor for two terms from 2005-11. Later served as the APEGS representative on the Geoscientists Canada Board of Directors. Served on the Academic Review Committee, Legislative Liaison Committee and is currently on the Investigation Committee.

Current Employment: CEO at EDGE Engineering and Geoscience.

Personal Interests: Active in physical conditioning, slo-pitch and golf.

South-East District

Trent Nelson, P.Eng.

University Education: University of Saskatchewan, B.Sc. in Mechanical Engineering, 2006.

Prior APEGS Involvement: N/A

Current Employment: Principal Engineer at TRON Engineering.

Personal Interests: Enjoys golfing, curling and snowboarding with friends. Also enjoys camping and going on hikes with his spouse and their dogs.

New Officers of Council and New Councillors

Geoscience South District

Gavin Jensen, P.Geo.

University Education: University of Alberta, B.Sc. in Land Reclamation and Remediation, 1998; University of Alberta, B.Sc. of Geology, 2003; University of Alberta, M.Sc. Geology, 2007.

Prior APEGS Involvement: Actively involved in planning the APEGS Annual Meeting and Professional Development Conference from 2013-19. Member of the Experience Review Committee and Liaison Councillor to the Connection and Involvement Committee as APEGS Council for Geoscience South District in 2018.

Current Employment: Senior Research Petroleum Hydrogeologist with the Saskatchewan Geological Survey (Government of Saskatchewan).

Personal Interests: Enjoys spending time with his wife at their cottage at Good Spirit Lake and running throughout Wascana Park during the summer months.

Group II (Mechanical & Industrial)

Ashok Thakkar, P.Eng., FEC

University Education: Bhavnagar University, B.Sc. in Mechanical Engineering, 1987; Indira Gandhi National Open University, MBA in Finance; Centennial College, Certificate in Project Management.

Prior APEGS Involvement: Served on the Experience Review, Academic Review and K-12 committees, as well as the organizing committee for four annual meetings and professional pevelopment conferences from 2005-17.

Current Employment: Senior Project Manager with EngComp in Saskatoon and is currently seconded to Nutrien, Rocanville.

Personal Interests: Fond and interested in music, sports, travelling, community services, photography and exploring new places.

Group V (Agricultural & Forestry)

Carolyn Emperingham, P.Eng.

University Education: University of Saskatchewan, B.Sc. in Agricultural & Bioresource Engineering, 2004.

Prior APEGS Involvement: N/A

Current Employment: Senior partner and structural engineer with Castle Engineering LLP in Swift Current.

Personal Interests: Enjoys family activities such as water sports, alpine skiing and camping. She currently serves as a board member on her children's swim club.

Member-in-Training

Caileigh Beckman, Engineer-in-Training

University Education: University of Regina, B.Sc. in Industrial Systems Engineering, 2017

Prior APEGS Involvement: N/A

Current Employment: Manufacturing Engineer with CNH Industrial.

Personal Interests: Has a passion for promoting women in the field of engineering. She is active in mentorship roles, independently and in her current workplace, to encourage the representation of female engineers.

Water security: A fluid challenge

Many contributing factors affecting the world's water supply

BY MARTIN CHARLTON COMMUNICATIONS

Saskatchewan's water supply is fairing better than most food-growing areas. Sustainability is a challenge, however.

Can a region provide a reliable supply of potable water to its population both now and in the future to do all of the things the region wants to do?

This is the definition of water security.

Jay Famiglietti, a NASA senior water scientist and global water crisis specialist, elaborated on this compelling topic during his presentation *First Century Water Security as Viewed from Space* during the APEGS annual meeting.

Famiglietti also is a hydrologist, professor and the executive director of the Global Institute for Water Security at the University of Saskatchewan.

Water is a valuable commodity now and, Famiglietti believes, will become an even greater must-have in the years to follow. That's because there are many competing uses for water – it's needed for growing food, for the environment and human usage, for energy production and for economic growth.

Couple that with depleting aquifers and dwindling groundwater supply, population growth and climate change and you have a serious water-security challenge on your hands.

Saskatchewan's role as one of the world's primary food growers will continue to gain momentum thanks to new climate change models that predict longer growing seasons. Saskatchewan also boasts a healthy supply of groundwater.

But, Famiglietti sees challenges in the future to counter that optimism.

When working in the U.S. with NASA, Famiglietti was part of the team that sent GRACE (Gravity, Recovery and Climate Experiment) satellite into space. This mission launched in 2002, aged out in 2017 and focused on Earth's ice sheets, ocean mass and aquifers.

The key takeaway? Scientists learned which regions are gaining or losing water mass. The majority of regions within the high latitudes and low latitudes are mostly gaining water. The mid-latitude region is mostly losing water.

GRACE also confirmed the ice pack in Greenland and Antarctica are melting and contributing to sea level rise (three millimetres per year).

As for Saskatchewan, Famiglietti feels it's faring better than most other major food-growing regions. Saskatchewan is well-positioned to grow more food. But there's a catch.

"California is running out of water. The mid-U.S. states are running out of water. These are two crucial areas for growing food," he says. "Our food-producing regions are in a state of chronic water scarcity. These are places that are trying to grow too much food with not enough water."

More than half of the world's groundwater supply is used for irrigation purposes. Groundwater on the Canadian prairies is depleting.

"If our water security is at risk then so is our food security."

As the planet's temperature increases – the Prairies are increasing at three times the global rate - the growing season increases. The catch being unpredictable freshwater supply and a decreasing snowpack from the Rocky Mountains that flows in the North and South Saskatchewan rivers.

"We have an opportunity, if not a need, to fill this global food gap," Famiglietti says. "But we need to do it sustainably. We need to be stewards of the water environment and nutrient management. We can learn

How can our infrastructure adapt to curb flooding events? Engineers can play a pivotal role in helping to manage the world's water supply.

from the mistakes from other regions that have gone into deficits."

The deficits he refers to is in groundwater supply. Globally, groundwater provides a primary water source for nearly one-third of the world's population. More than half of the world's groundwater is used for irrigation.

Famiglietti says groundwater supply is healthy yet declining in the Prairies.

Central Valley in California, a primary crop-growing area, has been experiencing steady groundwater depletion for years. Farmers there are using more groundwater because there is no surface water available. During California's peak drought in 2015, some subsidence was happening at one metre per year in some regions.

The world's major aquifers aren't faring much better. Because of climate change, the world's dry areas are getting drier, which places more emphasis on groundwater usage.

Population growth and climate change are two reasons why the world's water supply is decreasing.

More than half (20) of the world's major aquifers (37) are being depleted. Agriculture is the main reason, with 80 per cent of the water being withdrawn going to agriculture uses.

Water from underground aquifers can help create rich farmland. However, many aquifers are being emptied far faster than they can be recharged by rainwater. The Ogallala (High Plains) Aquifer in the mid-United States is one of the largest in the world (450,000 square kilometres and eight states). It is at risk of depletion.

"This is a real tragedy," Famiglietti says. "And it's continual … things are not getting better."

How do they improve? Famiglietti sees a need for more hydrogeological exploration. He says there's a need for regional and global science, for engineering, for water policy and for more innovation.

He says the role of engineers is plentiful and critical in managing the world's water supply.

"How can we adapt our infrastructure?" he asks. "What can we do about creating more efficient irrigation systems? There's a need for better storage and management. We're dealing with an increased frequency in flooding, so where can we improve the infrastructure with that?"

"Canada is doing a good job listening to these concerns. Globally, we're under-institutionalized to tackle this problem. A lot of these water- supply issues are trans-boundary. There's a lot of need to collaborate regionally in places that are really water stressed."

Overall, though, Famiglietti sees everyone playing a role and possibly rethinking the approach to water management.

For potable water, for example, perhaps it's time to consider different qualities of water used for different jobs, like questioning the use of purified water to flush toilets. Can we breed crops that are more saline tolerant? Humans also need to account for the effects of climate change and population growth.

"The human fingerprint on the freshwater landscape, through climate change and ice melting and through water management, is the dominant force that is causing this pattern," Famiglietti says. "This is happening way faster than people realize."

"(In Saskatchewan) … we don't want to go from being a have region to a have-not region."

Entering uncharted waters

How best to navigate changes to regulations

BY MARTIN CHARLTON COMMUNICATIONS

Every profession, including regulators, is experiencing changing trends in the way they conduct business. Those trends cover everything from more transparency to amalgamating with similar professions to an increase in litigation.

The winds of change have become a gale. They have swept across the world and across Canada. That's the message James Casey shared with his audience during his presentation *The Winds of Change: Key Trends Affecting the Regulation of Professions* during the APEGS annual meeting.

Casey noted Saskatchewan is not immune to wind. Its regulators, including APEGS and its members, should take notice.

"We live in a time of unprecedented change in the regulation of the professions," Casey explained. "This rapid change presents challenges and risks. But it also presents opportunities for those organizations that are prepared to be proactive and strategic."

Casey originally is from Estevan. Having grown up on the prairies and with a keen interest in sailing, he knows a thing or two about wind and how to navigate it. Casey now works as a labour arbitrator and as legal counsel to professional regulatory organizations at Field Law in Edmonton.

Casey highlighted 13 key trends affecting every profession across Canada, including professional engineers and geoscientists. He mused whether these trends present risks or opportunities for professionals, as well as provided strategies in how affected professions should respond to each trend.

A few of the key trends include:

Skepticism of self-regulators – Casey said the degree of skepticism is at an all-time high in Canada and around the world about the structure of self-governing professions.

He said a high percentage of government policy makers no longer believe in the value of self-regulation.

"Some believe self-regulating professions further only the interest of the members and not the public. They minimize competition and maximize prices," he said.

As a result, many international jurisdictions have adopted independent bodies that provide oversight of the regulators.

There has been a loss of self-regulating status around the world through indirect or direct government intervention through removal of self-regulating functions. Casey noted this is a threat to current structures because the structures are intended to advance the public interest.

In order to combat this, regulators need to reflect on whether they are carrying out their functions in a manner that increases public confidence and decreases skepticism. How can a regulator improve its relationship with government?

Casey suggested a regulator develop systems that measure performance; strengthen communications and start telling the stories that gain attention; enhance public participation; conduct governance reviews and improve government relations.

Enhanced transparency – There's a demand for more transparency – for government, for the media, for any public figure. It's a serious issue for regulators, too.

A dam collapsed and the damage and aftermath turned into a news story. A member of the media contacts the organization and asks if there is an investigation.

"There has always been a tension between transparency and privacy," Casey noted. "You need to

be transparent, but you also need to make sure you're complying with privacy legislation. It's a traditional tension."

The regulator needs to ask itself if it is sufficiently transparent to maintain public confidence. Is it making enough information public?

Amalgamation of regulators – The Chartered Professional Accountants Canada is one of the largest organizations of its type in the world. It's the amalgamation of the three largest accounting organizations - the Canadian Institute of Chartered Accountants, the Society of Management Accountants of Canada and Certified General Accountants of Canada - as well as the 40 national and provincial accounting bodies.

The B.C. College of Nursing Professionals follows the same formula. In fact, there are plans to amalgamate 20 health-professions regulators in B.C. into six regulators and create an oversight body over those regulators.

According to Casey, "It would create a tsunami of change in B.C.," as these different regulators have a forced marriage.

"There is a strong trend across Canada by policy-makers of wanting to create amalgamations of similar professions within one regulatory organization to enhance efficiencies," he continued. "This is trend among government in Canada. And it's gaining interest."

Any regulator needs to consider if there is any value in consolidation. If there isn't, it must be prepared to demonstrate the status quo advances the public interest.

Pressure on dual-mandate regulators – Some organizations act both as a regulator and perform some association activities. The trend is the governments and policy-makers are increasingly skeptical whether dual mandates are compatible with public interest.

Mounting skepticism led to the introduction of Bill 46 in Alberta. It was introduced last year when all health regulators were prohibited from serving as professional associations.

Casey believes every government in Canada will be looking at the Bill 46 initiative.

Strategies used by regulators: Identify every activity being performed by the regulator. Which of these activities are identified under legislation as requirements it must perform?

An example of an association activity would be posting a job board. It is membership-focused, but does it undermine the public protection function? If yes, then it comes down.

There's also a group of activities that falls between both. An example is continuing education. It's viewed as an association activity, however, it is good for members to have the regulator ensure they can make available continuing education.

Increased public participation – Bill 30 in Alberta is ground-breaking legislation that replaces the self-governing model for all health professionals with a co-government model for the health professions.

Before Bill 30 was introduced, a regulator required 25 per cent of its council be represented by public members. Now, it's a minimum of 50 per cent.

Governments are looking to increase the degree of participation in regulatory activities.

Over the past 20 years, public members have become more involved with the regulatory process.

Regulators should think about how they can voluntarily enhance public participation in the regulatory activities.

Disengage autopilot and take control

Achieving success requires self-care and being present

BY MARTIN CHARLTON COMMUNICATIONS

Our dream multiplied by hard work equals success. It's a simple equation and perhaps clichéd, but it makes sense when presented in this organic form.

But humans are fully stocked with emotions and thoughts that tend to complicate matters that steer away from paths to success.

But what is success? Achieving success means different things to different people. While we take different paths to reach it, and regardless what it feels like, success is something most everyone desires.

Michelle Cederberg, a coach, consultant and professional speaker, shared during the APEGS annual meeting her presentation The Success-Energy Equation: How to Regain Focus, Recharge Your Life and Really Get Sh!t Done.

Cederberg, the author of The Success-Energy Equation, equates success to being happy, healthy and financially stable. Again, all three variables are subjective. However, most people want some form of each.

"Success is how we define it for ourselves," she says. "The sooner we can define it and be OK with it, it's a great starting point for moving forward."

"The challenge is we don't often take the time or have the time to think clearly about what success means to us. As life gets busy, we think about these things and we all have the best intentions to be better versions of ourselves. When we can work at those things regularly then we can have more success."

"But we don't always do the things we want because we're good at making excuses and procrastinating and getting distracted with things that don't lead us to success."

"Everyone has the best intentions to be better and do better," she says. "When we're hard on ourselves for not getting stuff done, we have misplaced blame. We don't have enough time and energy to get to everything on our plate. We say 'yes' more often. We get distracted with things that aren't helping us drive forward."

Cederberg highlighted a few vehicles that may help us avoid these natural and common barriers. Here are a few ideas:

- **Setting clear goals.** Be present and take your brain off autopilot.
- **Believe and trust in yourself regarding these goals.** What you think affects the action you take.
- **Be disciplined to get the work done.** Evaluate your habits, identify your skills, focus and be determined.
- **Find the energy.** Take your breaks during the day. Recharge your body and brain with healthy eating. Get sufficient sleep and regular exercise. Connect with people you like to talk with.

"When we harness the energy within us, we can blow the roof off our success possibilities," Cederberg says. "Plus, good physical health is a foundation for personal and professional growth in everything."

Because of the COVID-19 pandemic, life has been put on hold and resulted in a mindset of waiting for things to get back to normal before proceeding with plans, whether they be personal or professional.

Routines have changed. Lives have been disrupted and the focus on achieving success may have been lost.

"The challenge for many people who are working from home these days is the lines between work and life have been blurred," Cederberg says. "When life gets busy and we get stressed - counter to what is right - we tend to put our own self care to the side."

Personal care and engaging in "the fun things in life" have been set aside. Those treasured vacations haven't happened. Navigating the pandemic has been disruptive in trying to home-school children, caring for our aging and stressed parents, and scrolling on social media and reading conflicting and troubling news stories.

Cederberg says now more than ever, people need to be taking care of their physical body and mind so they have the resilience and the energy to keep all of those juggling balls in the air.

For many engineers and geoscientists who are accustomed to working with machinery, the human body presents a new challenge.

"The human body is a resilient piece of machinery," Cederberg says. "It will put up with a lot of stress and strain before it starts to break down. We take that false sense of security and we keep on pushing into the stress and doing the work and telling ourselves we'll get back to taking care of our health when all of this covid is over and life is simpler."

But the body, unlike pieces of metal and gears and belts, is the only piece of machinery that actually gets stronger with use. It breaks down when it is not being used.

Cederberg stressed the importance of shifting from autopilot to being more present physically and mentally. She said people have a tendency to become robotic with their actions – something commonly referred to as "going through the motions."

"As soon as we are faced with a novel and new problem or challenge - like so many things that have been thrown at us during the pandemic - we will need our full brain capacity," she says. "All of a sudden, our autopilot shuts off and we're left sitting there wondering what we're going to do."

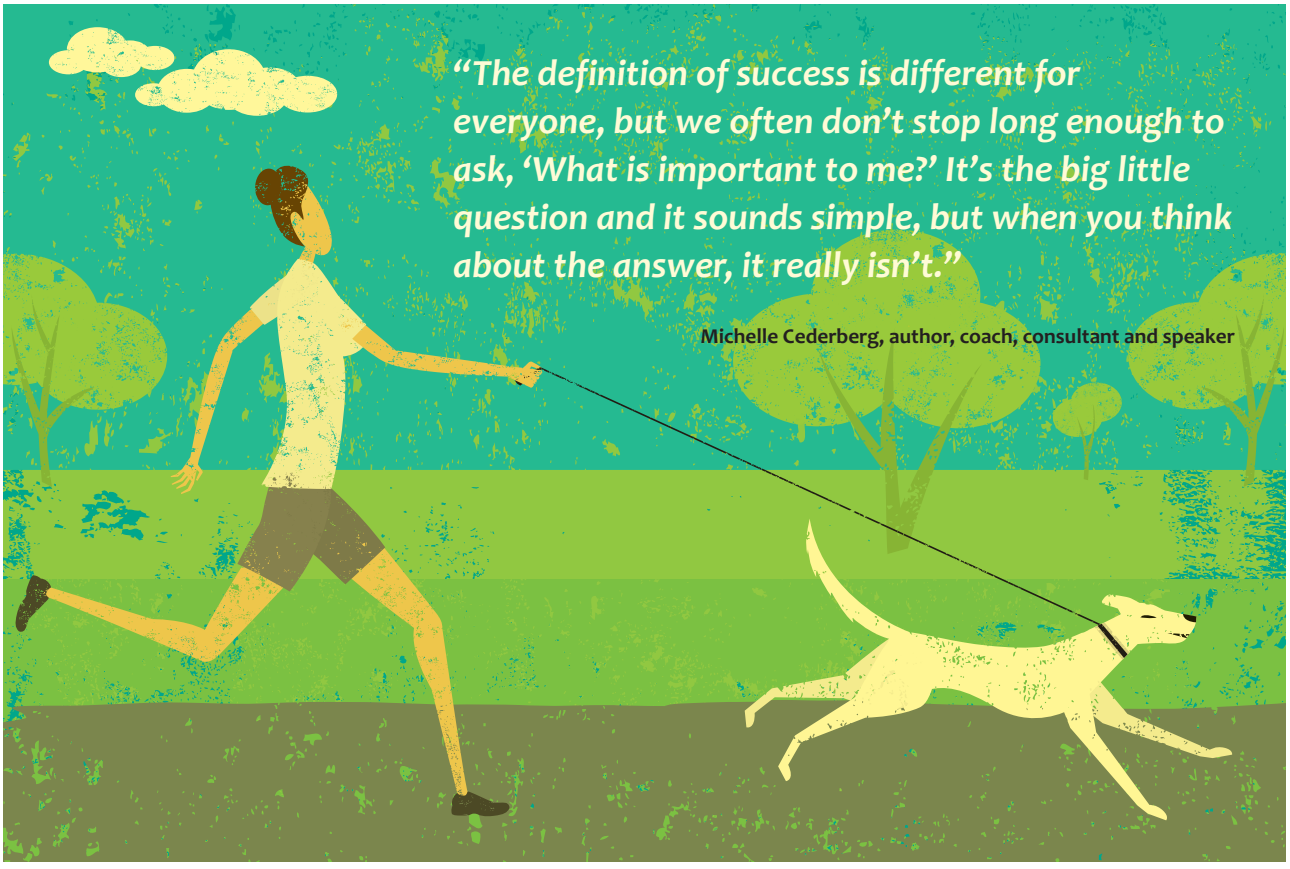
"We have so many decisions to make every day and most are happening at the subconscious level. When our brain operates on autopilot, we can get stuck in that mode if we're so busy and stressed."

"But if it becomes your go-to operating system then you do run the risk of after several months or years suddenly realizing you didn't mean to move in that direction."

Cederberg insists people can accomplish more if they prioritize the simple daily tasks to keep the energy moving.

She asks people to listen to their body and take regular breaks throughout the day, breaks people are forgetting to take.

"Our brains need breaks too, and it's not getting the sufficient break it needs right now," she says. "Take a technology break and go for a walk. Do it three times a day and see how much better you feel and how much more productive you'll be."



Critical materials for green energy

What are the constraints related to this industry?

BY MARTIN CHARLTON COMMUNICATIONS

Perhaps the most challenging aspect of the presentation from Kevin Ansdell, P.Geo., FGC, FEC (Hon.) was condensing the wealth of information into a 60-minute window.

Ansdell's presentation *Critical materials for green energy: Global to local geological constraints* at the virtual annual meeting introduced numerous avenues of intrigue related to this pertinent subject.

Mining activity, environmental concerns, economic benefits, government regulations, jurisdictional rights and supply and demand were just a few of the areas Ansdell highlighted that are linked to the world's push to a greener future.

"With the global population increase, the drive to try to decarbonize and reduce greenhouse gas emissions and the drive to electrification, the one thing that always gets missed is the geological background to all of this," Ansdell explains.

"All of the green energy aspects you can think of – the most obvious being wind and solar energy – the variety of different metals that are involved in production of batteries and wind turbines and solar panels … all of this involves a tremendous amount of and variety of materials that we mine."

The geological sciences professor at the University of Saskatchewan singled out lithium, graphite, nickel and cobalt from the Canadian government's recently unveiled list of critical materials.

As one would expect, the demand for these materials going forward is extremely high.

"Where are we going to source all these metals from that have the most sustainable industry?" Ansdell asked. "Of course, there will be environmental and social issues associated because we are extracting materials from the ground."

"If you have to mine more materials, where are you going to put the waste? Most mines mine more waste than the actual findings in extraction. So, are we reducing, reusing and recycling as many of the materials as we can and zooming further into net-zero mining?"

And then there's the seemingly ever-present China influence on these rare-earth elements. Sixty per cent of the world's rare-earth elements are mined in China, where there are 31 refineries.

Rare-earth elements are a small yet vital component of various permanent magnets used in objects like turbines, MRI machines, cellphones and several others. Ansdell said it highlights how important specific mineral deposits are for the world and our lifestyles moving forward.

The Saskatchewan Research Council received funding to build a rare-earth elements processing plant in Saskatoon, expected to be completed in 2022. It would be the first plant of its kind in North America and a destination for rare-earth elements mined across the globe.

Rare-earth elements are mined in Saskatchewan. Having a processing facility nearby would be an added bonus. Though, Ansdell made the point that Saskatchewan produces nearly 20 per cent of the world's uranium, yet it is shipped out of province for processing.

Ansdell believes Canada holds a distinct advantage when it comes to a splurge in mining for critical elements.

"Canada has a strict regulatory environment and list of requirements that need to be met prior to starting a mine," he said. "There are a host of environmental background checks and assessments and consultations with impacted landowners."

He feels investors will look to invest in companies that are ethically more responsible, meaning Canadian companies should be looked upon more favourably.

Congratulations, Geoscientists Canada!

This year marks 25 years of Geoscientists Canada championing effective regulation of the geoscience profession in the public interest.

To date, there have been three presidents from APEGS: Phil Reeves, P.Eng., P.Geo., FEC, FGC, Barry Collins, P.Geo., FGC, FEC (Hon.) and Greg Vogelsang, P.Eng., P.Geo., FEC, FGC.

In June 2021, Kevin Ansdell, PhD., P.Geo., FGC, FEC (Hon.), becomes the fourth APEGS member to be president of Geoscientists Canada.

You can read more about Dr. Ansdell in the Celebrating Our Own feature of The Professional Edge, Issue 187, July/August 2020, when it was announced that he had become the president-elect of Geoscientists Canada.

Stay in your lane

The importance of a Qualified Person in reporting

BY MARTIN CHARLTON COMMUNICATIONS

If the name Michael de Guzman doesn't ring a bell, then Bre-X Minerals most certainly will.

Bre-X Minerals was a Calgary-based company in the 1990s that boasted it had discovered the richest gold deposit ever in a remote jungle in Indonesia. Bre-X's top geologist at the time predicted the deposit might contain more than 200 million ounces of gold.

As expected, the company's value skyrocketed. From initial private offerings at 30 cents a share, Bre-X stock climbed to more than $285 on the open market. At its peak, Bre-X was valued at more than $6 billion.

Major mining companies fought an epic battle to get a piece of the deposit. Investment firms and mutual fund companies poured incredible amounts into the stock.

And then everything fell apart in a big way. The Indonesian government eventually revoked Bre-X's exploration permits. A new company took over the mine and soon learned there was no gold to be found.

It's a scandal rich with fraud, negligence and irresponsible reporting and one that rocked the professional geoscience community.

John G. Pearson, P.Geo., M.Sc., FGC, FEC. (Hon.) referred to this tale during his presentation Geoethics in Reporting for Resource Companies at the APEGS annual meeting.

The Bre-X scandal spurred new reporting standards. In Canada, regulators implemented NI 43-101 reporting standards in the early 2000s. Different jurisdictions around the world (South Africa, Australia, New Zealand and other popular mining hotspots) have their own version of NI 43-101 and what is required to work in those jurisdictions.

Included in the NI 43-101, it states all reports, news releases and associated reporting for mining projects be vetted by a Qualified Person - a professional geoscientist or engineer.

This defined who could do the work and a series of quality assurances and quality control on the analysis. It developed a framework for reporting. It also made sure that any publications are approved by a Qualified Person to ensure legitimacy.

"Anything that is published that is going to affect the value of the company and its investors all has to be reported and all has to be approved by a Qualified Person. You need to report everything … the good and the bad."

- JOHN G. PEARSON, P.GEO., M.SC., FGC, FEC. (HON.)

A Qualified Person could be an in-house employee or an independent.

"I was a mineral exploration geologist for the majority of my career," Pearson says. "I couldn't and wouldn't report on an oil reserve estimate because I have no experience with that."

Pearson is a former director for Geoscience Canada who played a role in developing a program for students related to specifics of a Qualified Person in mining and oil and gas industries.

Once you're a Qualified Person, it outlines what the expectations are for your career.

Pearson noted it is not possible to legislate ethical behaviour and reporting. He said it is the responsibility of each professional geoscientist and engineer to maintain ethical standards in practice and reporting.

Clean energy innovation

Collaboration is needed in several engineering disciplines

BY MARTIN CHARLTON COMMUNICATIONS

Energy comes to us in various forms. We use it and rely on it every day. However, the majority of that energy is sourced from fossil fuels. As a primary contributor to greenhouse gas and culprit for climate change and global warming, there's an increasing need to rethink and repurpose how our energy is produced.

Raphael Idem, P. Eng., Ph. D., M. Sc., outlined ways to mitigate greenhouse gas emission to lead us on a path to a more environmentally friendly future during his presentation *Production of Clean Energy: What Can Engineers Do?*

Idem is a professor in the Clean Energy Technologies Research Institute Faculty of Engineering and Applied Science at the University of Regina.

Between 1990 and 2019, emissions in Canada increased by nearly 22 per cent, driven primarily by emissions from oil and gas extraction and transport. In 2019, the top five emitters (Alberta, Ontario, Quebec, Saskatchewan and B.C.) together released 91 per cent of Canada's national total greenhouse gas emissions. The three western-most provinces experienced an increase in emissions.

Idem explains that while energy resources differ by region, each must adopt new ways to generate energy that isn't as harmful to the environment. Litigation isn't the only solution.

A variety of disciplines – chemical, electrical, petroleum, mechanical and structural engineers – each play a specific role. All need to work with policy-makers, politicians, scientists and economists to develop new strategies and technologies.

However, it's a relatively new area and there is yet to be a set process on how best to proceed with development.

"But there's a professional obligation of engineers and an ethical responsibility of engineers when it comes to protecting the environment," he says. "We need to do what we are professionally capable of doing and specifically trained to do."

A few of Idem's ideas on mitigating carbon emissions include:

CO_2 capture technology

This includes pre-combustion capture, post-combustion capture and oxyfuel combustion.

Pre-combustion capture is the capture the CO_2 from the energy resource before it is used as resource fuel to generate power.

Post-combustion capture is applicable to many industrial processes. The intent is to capture the CO_2 after the electricity has been generated.

Oxyfuel combustion sees fuel burned with almost pure oxygen instead of air. Controlling the flame temperature means some of the flue gases are recycled into the furnace.

Transportation

Exhaust from vehicles contributes to the greenhouse gas family. A solution is to manufacture more vehicles than run on zero emissions. Examples would be biofuel-operated buses and electric vehicles and recharging at electric stations where the electricity is produced from non-carbon-generating resources.

Zero-emissions energy resources for power

The most popular methods include wind, solar and hydro energy.

"Which one is the best one to use?" Idem asks. "There is no single technology or policy that can do it all."

"Engineers can play a critical role in developing innovative technologies and processes that can reduce the causes of climate change and global warming.

But no one policy is going to satisfy all regions."

- RAPHAEL IDEM, P. ENG., PH. D., M. SC.

Adding colour to a grey area

Governments, law, resources and how they intertwine with Indigenous rights

BY MARTIN CHARLTON COMMUNICATIONS

Inadequate consultation. Those two words were paramount in the disapproval the Northern Gateway pipelines Enbridge planned to construct from the Athabasca oilsands in Alberta to Kitimat on the northern coast of B.C.

The twin pipeline would have imported natural gas condensate eastbound, while the westbound pipeline would have exported diluted bitumen from Alberta to a marine terminal in Kitimat for transportation to international markets via oil tankers.

First Nations groups, among others, denounced the project for several reasons, including environmental, social and cultural risks posed by the pipeline.

Enbridge countered by saying the pipeline would provide Indigenous communities with equity ownership, employment and stewardship programs.

The two sides took their battle to court where the Federal Court of Appeal ruled that consultation with First Nations was inadequate. It overturned the approval.

This is one of many examples where resource development projects intertwine with Indigenous lands and Indigenous rights.

Benjamin Ralston, a sessional lecturer at the University of Saskatchewan's College of Law, provided some colour to this grey area during his presentation *Indigenous Consultation and the Public Interest for Engineers and Geoscientists* during the annual meeting.

"As an engineer or geoscientist, you have ethical obligations to adequately communicate information to the public," he says. "But in doing so, there's not just an environmental dimension to that and not just the public safety dimension. There's also this constitutional right aspect that could play into that."

He adds that what is so challenging with Indigenous rights is how it is inter-related with various other factors that engineers and geoscientists deal with. There are considerations of bio-physical, technical, economic and social dimensions of resource development and environmental protection and how they are inter-related. These often can't be disentangled.

Similarly, the protection of Indigenous rights is tied to these same factors.

The example of the Northern Gateway project relates to the duty to consult. This should allow Indigenous people to participate in resource management decision-making even when the scope of their rights remains uncertain.

Several First Nations in B.C. said neither the Crown nor the established assessment process for the Enbridge project adequately met their duty to consult and accommodate or respect their Aboriginal Rights and Title.

The duty to consult is about managing the uncertainty through meaningful consultation and accommodation of Indigenous concerns while these matters are negotiated or litigated in courts.

Duty to consult also serves as a prerequisite to any finding that a project is in the public interest and should be approved.

Ralston relayed advice the courts have given from similar projects that have either been quashed or upheld.

- Timing. The earlier the consulting is done, the better. Consultation should be prompt and occur at the planning or environmental assessment stage rather than at the licensing stage.
- Community engagement with elders an retain any outside experts.
- Consultation needs to focus on Indigenous rights. In order for this to meet the Crown's duty to consult, it can't be consultation about bio-physical effects. It has to be about impact on rights.
- Decision-makers also have to be open to changing their minds based on their information. Maybe a change in policy or a different decision is required.

"Everything we do in law is grey," Ralston says. "But you have different governments at varying levels that come up with their own ideas about how to engage in consultation. Each province and territory will propose its own consultation policy."

"Indigenous rights within Canadian law and this duty to consult and accommodate is an inter-disciplinary conversation. It involves all sorts of technical skills and all sorts of legal advice. But it is not restricted to this domain of the courtroom."

Make room for SMRs

Many believe this is the future of energy production

BY MARTIN CHARLTON COMMUNICATIONS

The Conference Board of Canada recently peered into a crystal ball and delivered a report on the future of small modular reactors (SMRs) in Canada.

There's a tentative plan to bring a SMRs to Saskatchewan, part of a move that could eventually generate 1,200 megawatts of emissions-free power.

That's according to a feasibility study on the nascent technology by SaskPower, along with utilities in New Brunswick and Ontario. It's part of the process launched as a memorandum of understanding between three provinces. Alberta joined in mid-April.

Darcy Holderness, P.Eng., project manager, asset management and planning with SaskPower, shed some light on this subject during his presentation at the annual meeting. He was joined by power utility representatives from New Brunswick and Ontario.

The utility recently completed its feasibility study and has since entered a planning phase, which should cover the next seven years. Construction and investment decisions will be made during this timeframe, as well as site selection for a plant and a desired type of SMR. This will lead to initiating in the regulatory processes.

Holderness stresses the importance of engagement in developing the supply options. He says Indigenous, stakeholder, customer and public engagement will be streamed into the process as supply options are eventually decided.

"There are a lot of key milestones that need to be met for this to be a possible option by this timeframe," he says.

In addition to being cost-effective and reliable zero-emission power options, nuclear power development provides other benefits.

SMRs could offset economic losses as conventional coal is phased out. Plus, they would help lower the reliance on natural gas.

SMRs also can support the aggressive deployment of renewables. When renewables like wind and solar are generating a lot of electricity, some of the energy from an SMR could be diverted into hydrogen production, which would help to decarbonize other industries.

Some key requirements for SaskPower to successfully develop this technology include:

- **It's a new technology and it needs to be de-risked in other jurisdictions before implemented in Saskatchewan.** There's a reliance on utility partnerships and a Canadian approach to deploying this technology.
- **Indigenous participation.** Saskatchewan sees success with its uranium mining and the Indigenous participation related to it. SaskPower feels the same success can be experienced with this new industry.
- **Federal risk sharing.** It's a new technology in a new jurisdiction. It's going to take significant investment early in the process to get qualifications and capacity to be successful. Share that risk with the federal government through cost-sharing.

The Conference Board of Canada says SMRs could generate $1.6 billion to Saskatchewan's GDP.

"Ultimately, it comes down to a competitive price of power," Holderness says. "SMRs have to be able to compete with other power-generation options for them to be deployed in Saskatchewan. That's the top criteria."

On average, manufacturing and construction could add 7,042 jobs per year from a fleet of Saskatchewan SMRs.

NOTICE:

APEGS' website, apegs.ca, is being redesigned for fall 2021.

More information is forthcoming.

Member Profile

Dino Philopoulos, P.Eng., FEC, M.Sc.

This month *The Professional Edge* chats with Dino Philopoulos, P.Eng., FEC, M.Sc.

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

I was born in Winnipeg to a Greek immigrant family.

When I was five, we relocated to Greece where I completed high school. I returned to Canada in 1997 for post-secondary studies in civil engineering at the University of Manitoba.

During my studies, I also was employed as a research assistant and further pursued a Master of Science degree while also serving as a sessional lecturer for the Engineering Materials course.

Upon completion of my studies in 2005, I returned to Greece to complete mandatory military services. In 2007, I returned to Saskatchewan and joined the KGS Group Regina office.

Why did you choose to go into engineering?

From a young age I had a special interest in how things are built and would often take apart toys and household appliances to better understand how they were built. Later, I realized engineering is the discipline that converts scientific discoveries into practical applications that improve our quality of life and overall safety.

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

I had an uncle in Greece with whom I spent countless hours as a young child, watching him design homes and produce drawings by hand.

What was your first job after university? What is your current job title and what do you like most about your work?

My first job after graduation involved structural design for military and residential applications in Greece.

My first job in Canada was a Structural Engineer-in-Training in consulting engineering for the commercial and institutional sector.

My current position is Regional Manager for KGS Group's Saskatchewan operations, overseeing the development and growth of our offices in Regina and Saskatoon.

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

The work I primarily execute within the potash industry involves hundreds of assignments on an annual basis. They vary in size, yet all are important in maintaining safe production operations that affect global food security.

My overall sense of accomplishment relies on the fact that throughout my career I have managed to break down the various barriers that may come between consultants, owners and contractors, in favour of collaborative approaches towards sound, practical and safe engineered solutions.

What do you do for continuing professional development? Are you involved in any outreach programs?

I have been fortunate to participate in APEGS committee work for about 10 years.

One event I recently participated in and highly recommend was the Indigenous Awareness Training offered through the Saskatchewan Chamber of Commerce. I found it to be an eye-opener on certain struggles the Indigenous community is facing.

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

My personal interests include enjoying the outdoors, travelling and socializing with my wife Effie, daughter Rhea and son Nicholas. I like playing the electric guitar and other traditional musical instruments, as well as soccer, computer programming, breakthrough science and public policy.

Gems of Geoscience

Faisal Sayeed, P.Geo., is a mineral rights specialist with the Government of Northwest Territories.

A rare find while hiking

I have worked in the mining and exploration industry for the past 16 years.

I graduated from the University of Saskatchewan in 2003 with dreams and aspirations of working in the oil and gas sector, but fate would have me go in a different direction when I got an offer from a large oilsands mining operation in Fort McMurray, Alta.

I was hooked!

It did not take long to realize how engaging the mining industry is and how exciting my career would be as I grew more comfortable in my various roles.

Every day is unique, brings new challenges and amazing opportunities to solve problems. I work with diverse, fun-loving and overtly optimistic colleagues (it is vital to be optimistic in the mining sector, especially in exploration).

I am currently engaged with the Government of Northwest Territories as a Mineral Rights Specialist, assisting in drafting new regulatory framework for mining and resource development.

How did I find my favourite rock?

On a recent hike in the bush around Yellowknife, I found a chunk of a very special igneous rock called pegmatite. Pegmatite is easy to spot due to its large crystals and its dull lustre due to abundance of quartz or feldspar.

My specimen, however, was a bit different with red and purple crystals and contained minerals I could not readily identify. Naturally, the rock went straight into my backpack for further questioning.

Later that week, the mystery mineral was identified by one of my esteemed colleagues as Bastnäsite. This was really exciting as I had never seen this mineral before. My new pegmatite specimen became very special.

Pegmatite(s) are very unique igneous rocks formed during the final stages of crystallization in magma chambers, deep below the earth crust.

Most intrusive igneous rocks (such as granites) have large crystals due to slow cooling of magma. But pegmatite(s) go through an extra step during that process, which not only makes them stand out from the rest, but also a potential source rock for Rare Earth Elements (REE); valuable commodity these days.

In the early stages of crystallization, magma usually contains large amounts of dissolved water. As the minerals with the highest melting point (most common rock forming material) start to crystallize, water is not removed.

As crystallization progresses, water becomes overabundant and eventually separates in magma, forming pockets of low viscosity regions in the melt. This allows lighter, smaller ions (such as lithium and beryllium) to move freely in the low viscosity environment compared to the rest of the magma.

As the gradual cooling of magma continues, larger crystals start to form containing elements not commonly found in most rocks; hence, the elevated contents of REE.

Faisal Sayeed, P.Geo., was hiking near Yellowknife and found Bastnäsite, a pegmatite specimen. Pegmatites are unique igneous rocks formed during the final stages of crystallization in magma chambers, deep below the earth crust.

APEGS Member Disciplined for Professional Misconduct

A professional engineer member of the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) was found guilty of professional misconduct following a discipline hearing held on January 28, 2021.

Mr. Bilal Mahboob plead guilty to one count of professional misconduct:

- That the member provided a forged transcript from the Allama Iqbal Open University.

The panel determined this action by the member was in breach of subsections 20(1)(d)(i) of *The Engineering and Geoscience Professions Act* and section 20(1) of *The Regulatory Bylaws.*

After receiving and reviewing evidence in the forms of exhibits, the Discipline Hearing Panel found Mr. Bilal Mahboob guilty of professional misconduct.

The Discipline Hearing Panel acknowledged that the fundamental purpose of sentencing for professional misconduct is the protection of the public.

The Discipline Hearing Panel also considered the following factors when determining its sentence:

- Nature and gravity of the offence.
- Risk to public safety.
- Need to ensure the public's confidence in the integrity of the profession.
- Advantage gained or to be gained by the member.
- Effect on the victim.
- The number of times the offence occurred.
- Specific deterrence of the member from engaging in further misconduct.
- General deterrence of other members of the profession.
- Rehabilitation of the offender.
- Punishment of the offender.
- Denunciation by society of the conduct.
- Range of sentences in other cases.

The Discipline Hearing Panel also considered mitigating circumstances:

- Member's age and experience.
- Family and personal circumstances.
- History of the member's professional conduct.
- Member's acknowledgement of responsibility and steps taken to disclose and redress the wrong.
- Previous service history of the member.
- Effect on the member of sanctions.
- Effect of the proposed penalty on the member.

The hearing panel made it clear that it considers obtaining membership by providing forged documents to be an extremely serious form of professional misconduct. Such behaviour is corrosive to the high standards of integrity expected by the public of professional engineers and professional geoscientists.

Having considered all the above, the Discipline Hearing Panel ordered as follows:

1. That Bilal Mahboob is hereby reprimanded for professional misconduct.
2. That Bilal Mahboob is hereby suspended from the association and he shall be ineligible to reapply as a member of the association for a period of three years from the date of this Decision and Order and membership shall be subject to the conditions described below:
   a. That if Bilal Mahboob wishes to be reinstated with APEGS, he must reapply as an international graduate engineer-in-training.
   b. That Bilal Mahboob shall pay a fine of $5,000, to be paid prior to registration as an engineer-in-training.
   c. That Bilal Mahboob shall pay costs of the investigation and hearing into the member's conduct and related costs, including the expenses of the investigation committee and the discipline committee and costs of legal services. Costs shall be assessed to a maximum of $10,000, of which 50 per cent shall be paid by Bilal Mahboob, to be paid prior to registration as an engineer-in-training.
   d. That Bilal Mahboob satisfactorily completes all academic deficiencies identified by the APEGS Academic Review Committee at the time of his re-application as an international graduate engineer-in-training.
3. That as a condition of any application for registration with APEGS as a professional engineer, Bilal Mahboob completes four years of acceptable engineering work experience, commencing on the date of his future registration as an engineer-in-training and submits that work experience through the competency-based assessment process.
4. That as a condition of any application for registration with APEGS as a professional engineer, Bilal Mahboob completes the APEGS Law & Ethics Seminar prior to writing and passing the Professional Practice Exam.
5. That the Decision and Order shall be published on the APEGS website and in *The Professional Edge*, with name.

Bilal Mahboob was reminded that, while not registered with APEGS, he may not use the title "engineer" in any form, nor imply that he is a professional engineer, as per Section 26 of The Act.

Notes from APEGS Council

The APEGS Council held an online meeting via Microsoft TEAMS on March 26, 2021. The meeting was attended by 16 of 19 councillors and the directors to Engineers Canada and Geoscientists Canada. Council will meet next on June 17-18, 2021 via Microsoft TEAMS.

Council received the following presentations and information items:

- The APEGS director to Engineers Canada provided a written report and a verbal update on the activities of the national organization.
- The communications manager provided a status update on the 2021 Strategic Communications Plan.
- The executive director and registrar provided an update on staff reorganization and succession planning.
- The executive director and registrar provided an update on the Association's operations and impacts caused by the ongoing COVID-19 pandemic.
- A request by a complainant for Council to review a decision by the Investigation Committee that no further action be taken on a complaint.
- The director of registration provided an update on the plans for the online 2021 Annual Meeting and Professional Development Conference.
- The APEGS director to Geoscientists Canada provided a written report and verbal update on the activities of the national organization.
- The director of registration provided a report on the results of second round of the 2020 CPD Compliance Reviews.

Council passed motions as follows:

- Approving the updated 2021 budget reflecting the online 2021 Annual Meeting.
- Approving three recommendations resulting from the Governance Review project.
- Approving the following work completed by the Nominating Criteria Task Group: Council, Board and Committee Chair Evaluation Procedure and the Terms of Reference for a standing Nominating Committee.
- Approving that the use of NCEES records be temporarily suspended while staff confirms their information validation processes.
- Approving amendments to the CBA Guide.
- Approving three academic review policy updates.
- Appointing Kevin Bundschuh, Engineering Licensee as the Chair of the Professional Practice Exam Committee.
- Approving changes to a Professional Practice Exam policy incorporating the use of the National Professional Practice Exam.
- Approving updates to the CPD Program document.
- Approving updates to the CPD Review process.
- Approving the criteria by which members will be randomly selected for 2020 CPD Assurance Reviews.
- Approving 20 applications for Life Member.
- Approving a policy for member PD Days Credit Lottery to be implemented in 2022.
- Appointing Russel Johnson, P.Eng. as the chair and Brent Marjerison, P.Eng. as the vice-chair of the Investigation Committee.
- Appointing Margaret Ball, P.Eng., FEC and Jason Whitelaw, P.Eng. to a second term and appointing Nicholas Hayduk, P.Eng., and Andrew Karvonen, P.Eng., P.Geo. to a first term on the Investigation Committee.
- Approving the draft audited 2020 financial statements.
- Approving increasing the amount in the working capital reserve.
- Accepting a proposal to conduct reconciliation training for APEGS staff, council, volunteers and members.

Council noted and received the following reports:

- Registrar's reports for January and February 2021.
- The unaudited financial statements for January and February 2021.
- Executive Committee minutes, board minutes and the reports from the committees and task groups, abridged Investigation Committee minutes, Discipline Committee minutes, Governance Change Steering Group minutes and Nominating Criteria Task Group minutes.

Governance Change

A major milestone was achieved in setting the path to improved governance, one of the major goals of the governance change project. At APEGS' annual meeting on May 1, membership approved bylaw changes on council size and composition with an overwhelming majority. The membership confirmed they are on side with governance improvements.

Council will be reduced from 19 individuals to 13. This includes the two members of the public appointed by the provincial government and 11 councillors elected by the members, retaining the minimum number of engineers and geoscientists on council required by *The Engineering and Geoscience Professions Act*. The reduction will occur gradually over three years through attrition beginning with the 2022 elections.

Councillors will be elected as members-at-large rather than based on discipline, geography or member-in-training status. Terms will continue to be staggered by electing a minimum of two members-at-large each year until council size is reduced. Only members who are compliant with the requirements of the CPD program are eligible for nomination.

Council has assigned the responsibility to the Nominating Committee to attract and vet candidates using council-approved criteria and procedures to ensure council is comprised of eligible members with the knowledge, competency, character and diversity to regulate in the public interest.

To date, council has approved 27 of the recommendations and staff and committees have taken action or are in the process of taking action on those recommendations. Council will consider the final six recommendations further to planned consultations, as outlined in each of their specific feasibility plans.

What is this project about?

APEGS is reviewing its governance and regulatory frameworks and practices. The review focuses on 33 recommendations made by a consultant regarding:

- Council size and composition.
- Risk management.
- Public transparency.
- Management of sponsorships.
- Organizational structure.
- Roles of committees and staff.
- Training for committees.
- Relationship with constituent societies.

Why is APEGS doing this project?

A growth in membership and changes in the regulatory environment make a review timely to modernize governance that focuses resources on activities aligned with enhancing regulatory effectiveness.

For more, refer to previous issues of The Professional Edge from May/June 2020 to Mar/Apr 2021.

Direct questions to Tina Maki, P.Eng., Director of Special Projects at tmaki@apegs.ca. She will relay them to the steering group.

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)

Staff Advisors
Bob McDonald, P.Eng., Executive Director and Registrar
Shawna Argue, P.Eng., Director of Registration

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

Consultants:
T. Bakkeli Consultants Inc. and Lana Gray Leadership Services

Continuing Professional Development

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

Online Ethics Module #3 Launches in April

The next instalment of the free APEGS online ethics modules launched in April 2021.

Our current ethics module topics are:

- Module 1 - Professionalism and Ethics
- Module 2 - Conflict of Interest
- Module 3 – Investigation and Discipline

For more information and to access the modules, visit the CPD menu at apegs.ca.

CPD Tutorial Videos

Are you looking for more help in understanding the APEGS CPD Program? Check out our CPD Tutorial Videos on YouTube. Links to these videos can be found on the CPD page of the APEGS website. Current topics include:

- How the CPD Program Works.
- CPD Program Requirements.
- CPD Scope of Practice and CPD Plan.
- CPD Activity Categories.

Featured Professional Development Opportunities

2021 Fall Professional Development Days

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, email cpd@apegs.ca.

2021

Important CPD Program Deadlines to Help Achieve Compliance

September 30, 2021 - Deadline to apply for a 2021 CPD Variation.

December 31, 2021 - Deadline to obtain credits for the 2021 reporting cycle.

January 31, 2022 - Deadline to report online your 2021 CPD credits earned.

Did You Attend the 2021 Online Annual Meeting?

Attendance at the 2021 online Annual Meeting counts as credit for the CPD Program:

EVENT TYPE	CPD ACTIVITY CATEGORY
Professional Development Track Sessions*	Informal Activity*
Keynote Sessions*	Informal Activity*
Business Meeting on May 1, 2021	Participation
Awards Ceremony	Participation
Keynote – The Winds of Change: Key Trends Affecting the Regulation of Professions	Formal Activity and Ethics credit
PD Track – Geoethics in Reporting for Resource Companies	Formal Activity and Ethics credit
PD Track – Communication as Ethical Action	Formal Activity and Ethics credit
PD Track – Indigenous Consultation & Public Interest for Engineers & Geoscientists	Formal Activity and Ethics credit

**Unless otherwise noted.*

Common mistakes when reporting CPD

This is the second year that APEGS members have been required to participate in the Continuing Professional Development (CPD) Program. While the overall compliance rate increased by two per cent from 2019, there are some common mistakes still being made. Here is a summary of these common errors.

REASON	REMEDY
Did not complete the annual verifiable ethics training, or at least did not check the box that you did so.	APEGS offers a variety of ways for members to obtain the required annual verifiable ethics refresher training, including online modules that are free to all members and are accessible through the APEGS home page (www.apegs.ca). The CPD Program Document and the CPD webpage also provide several suggestions for ways that members can achieve this requirement. Note that members are required to obtain at least one cumulative hour of verifiable ethics training annually and must report this in their CPD online reporting by: • Checking the Ethics Training box online. • Claiming the time under Formal Activity.
Did not report any CPD information to APEGS.	There are numerous ways members can earn eligible credits for the CPD Program. Working in the professions is not the only eligible activity. Many activities are also available for free or for minimal cost. For more information on what activities are eligible, refer to Section 3.2 in the CPD Program Document, or watch the short CPD Tutorial Video called CPD Activity Categories on YouTube. The link can also be found on the CPD page of the APEGS website.
Checked the box that you reported elsewhere, even though your preferred address is Saskatchewan.	If your preferred address is Saskatchewan, you cannot check the box that you reported elsewhere. You are required to report to APEGS. Alternatively, you can change your preferred address to one in a different jurisdiction if you live or work there and then check the box that you reported elsewhere, assuming you are a member there.

For more information, navigate to the CPD tab at apegs.ca where you will find the CPD Program Document, helpful tutorial videos and online ethics modules.

2020 CPD Reporting Compliance Review Results

A review has been completed to ensure that members are reporting their CPD for the 2020 reporting cycle. APEGS reviewed each member's record (more than 12,000 in total). While there was a two-per-cent increase in compliance compared to 2019 reporting (88 per cent in 2019 compared to 90 per cent in 2020), there is still need for improvement. Members are reminded that it is their professional obligation to participate in the CPD program and report as required as per the Engineering and Geoscience Professions Regulatory Bylaws, section 23.2.

Members were required to report their information to APEGS online by January 31, 2021. The following is a summary of the 2020 compliance review results.

CATEGORY	TOTAL NUMBER OF MEMBERS
Members who met their 2020 CPD requirements	11,289
Members who reported but did not meet all requirements	683
Members who failed to report to APEGS	429
Overall compliance rate	90 per cent

Members who reported their information to APEGS but failed to meet their 2020 requirements will be assigned a Remediation Plan in 2021. Members must complete these assigned tasks in addition to their 2021 CPD requirements. Following is a summary of the reasons why members did not meet their annual requirements:

NOT COMPLIANT REASON	TOTAL NUMBER OF MEMBERS
Missing Ethics Requirement	572
Missing Credits, Activity Categories and Ethics Requirement	15
Missing Credits Only	34
Missing Activity Categories Only	18
Missing Credits and Activity Categories	21
Missing Credits and Ethics	11
Missing Activity Categories and Ethics	12

The 429 members who failed to report to APEGS for the 2020 CPD reporting cycle have been placed on administrative suspension. The repercussions for a member who has been administratively suspended are:

- These members are not licensed to take professional responsibility for any engineering or geoscience work in Saskatchewan;
- These members will appear in the APEGS register as being administratively suspended;
- If a suspended member is an Official Representative for a company's Certificate of Authorization, they are no longer permitted to hold this position. If they are the only official representative for a company, the company's Certificate of Authorization will be revoked and the company is not permitted to offer engineering or geoscience services in Saskatchewan;
- If a member uses the Notarius electronic signature to sign documents, this privilege is revoked and a member must reapply and pay the application fee again if they wish to use this service after they are reinstated; and
- If a Member-in-Training is suspended, they are not permitted to write the Professional Practice Exam while suspended or apply for professional member licensure.

Members who are administratively suspended must apply to be reinstated. Members must submit requested CPD supporting documentation along with their application for reinstatement. APEGS will review their application and wthl only reinstate a member once they have successfully met all the criteria. This process may take a few weeks to complete, depending on how quickly a member meets their outstanding requirements and supplies APEGS with all the required documentation.

CPD Program Changes

Council approved amendments to the Continuing Professional Development (CPD) Program at its March 26, 2021 meeting. These changes and updates were made based on feedback received from members and lessons learned from the past year to make requirements clearer for the benefit of the members.

Visit the CPD tab at apegs.ca for the current document. Here is a summary of the changes:

SECTION	CHANGE
Section 1.2 - Applicability	Temporary Licensees are not required to participate in the CPD Program.
Section 2.3 – CPD Plan	CPD Plans are required to contain the following information, at a minimum: Member name, job title, scope of practice description and a list of learning activities planned for the year.
Section 3.2.4 – Presentations (CPD Activity Category)	Completion of presentation activities must be verifiable.
Section 3.2.6 – Contribution to Knowledge (CPD Activity Category)	Verifiable evidence may be requested for activities claimed under this category. See Section 3.2.6 for a complete list.
Section 3.3 – Annual Ethics Component	Once the annual ethics training has been completed, members must check the Ethics Training checkbox online and then record the hours spent on ethics training under the Formal Activity category.
Table 5: Annual Reporting Requirements	Members are only able to report to APEGS using the Reporting Elsewhere option if they are also reporting their CPD information to another Canadian engineering or geoscience regulator. Members must also disclose their member ID number from that regulator to APEGS.
Section 4.6 – Credit Requirements for Waiver Holders	Members who hold a licence waiver for the entire year require a minimum of 30 credits annually obtained outside of professional practice, including one hour of verifiable ethics training, which shall be claimed under Formal Activity as part of the 30 credits.
Table 6	CPD credit requirements for new members have been adjusted. Refer to Table 6 in the CPD Program Document for details.
Section 5.2 – Application for a Variation	Logic for calculating how many credits is required for a CPD Variation application has been added.
Section 5.3 - Approval of a CPD Variation	If the CPDCC assigns an alternate Variation or contract and requires the member to provide written acknowledgment of the new conditions, the member must return the agreement letter to APEGS within 30 days or the Variation expires and the original program requirements are reassigned. The member must submit a new Variation Request if they require their file to be reassessed.
6.2 – Remediation Plan Initiation	If the member is the initiator of the Remediation Plan, the Plan and the member's detailed record of their CPD activities for the deficient year must be submitted to the CPDCC for consideration.
Section 7.3.1 – Annual CPD Assurance Review Process	At a minimum, the Assurance Review will require members to submit the following: • CPD Plans for the requested period. • Detailed CPD activity records. • Verification records for formal activity, presentations and contribution to knowledge activities claimed. • Verification records for the annual ethics training.

This informational series explores how members can ensure they are complying with The Engineering and Geoscience Professions Act. APEGS is responsible for the regulation of the practices of professional engineering and professional geoscience in Saskatchewan, which includes safeguarding the public.

APEGS has been granted the privilege of regulating these professions by the Government of Saskatchewan, which has given APEGS the mandate to do so through ***The Engineering and Geoscience Professions Act****.*

Did you know....

APEGS Certificate of Authorization

The Engineering and Geoscience Professions Act requires that every partnership, association of persons or corporation that engages in the practice of professional engineering or the practice of professional geoscience as its principal or customary function shall obtain a Certificate of Authorization (C of A). The Certificate of Authorization is essentially a company's licence to offer engineering or geoscience services in Saskatchewan.

Who needs a Certificate of Authorization?

The requirement for a C of A applies equally to a large, publicly traded corporation and to a corporation in which one member is the sole shareholder, director, officer and employee.

This requirement also applies equally to the traditional engineering or geoscience consulting firm (principal function) and to those firms that are not thought of as engineering or geoscience firms, but customarily engage in the practice of professional engineering or professional geoscience.

A business that engages in the practice of professional engineering or professional geoscience as an unincorporated sole proprietorship is not required to obtain a C of A.

How to maintain a Certificate of Authorization

The holder of a Certificate of Authorization will be limited to providing services under the supervision of a licensee or licensees who hold an annual or temporary licence and in accordance with any limitations to the licences of those licensees.

How a Certificate of Authorization is revoked

If a partnership, association of persons, or corporation ceases to have an official representative, its C of A is revoked and the company must cease its practice of professional engineering or geoscience.

Certificate of Authorization obligations

According to the Regulatory Bylaws, every holder of a Certification of Authorization is required to place its seal or equivalent on all documents that have been prepared by a licensee on its behalf.

What information can be disclosed to the public regarding Certificate of Authorization holders?

According to the Regulatory Bylaws, APEGS is permitted to disclose the following information about a C of A holder:

1) Name of holder
2) Location
3) Listing of all official representatives

Member Grant Recipients

2021

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

This year, there were three applications.
The following APEGS members received grants:

Dustin Unger, P.Eng.

Hadi Ramin, Engineer-In-Training

Shahab Minaei, Engineer-In-Training

Eligibility requirements

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

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

How to apply

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

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

SUSTAINABILITY:

Climate change adaptation

BY IAN JUDD-HENREY, M.SC, P.GEO. AND DAVID SAUCHYN, PHD., P.GEO. FOR APEGS' ENVIRONMENT AND SUSTAINABILITY COMMITTEE

This is the second of a series of articles on the United Nations Sustainable Development Goals and how they relate to the practice of engineering and geoscience.

It is widely accepted that we are in a period of changing climate. Federal scientists are predicting a future for the Prairies that includes hot and dry summers and warm and wet winters.

With this warming climate comes increased severity of extreme weather events and an increased risk of wildfires. A recent Canadian report says that since 1983, 13 of the 20 most costly weather-related disasters in Canada happened on the Prairies. So, large-scale climate changes and weather extremes should be considered during all aspects of infrastructure planning and design.

Climate change adaptation is the process of reducing the public's vulnerability to current or expected climate-change and climate extremes. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

It has been said that neither adaptation nor mitigation actions alone can prevent significant climate change impacts (Intergovernmental Panel on Climate Change AR5 report). But taken together, they can significantly reduce the risks of climate change. It is this de-risking of the effects of climate change and climate extremes on proposed projects that engineers and geoscientists need to consider.

There is intense interest by financial institutions and investors in climate change and sustainability planning. This will be on full display during the upcoming Conference of the Parties this fall (COP26). Already there is significant and regular news that various corporations (United Airlines, Shell, BP and Air Canada) are committing to becoming net zero by a certain date.

There are international requirements and guidelines for the consideration of adaptation to climate change to better understand climate risks and uncertainties within organizations (ISO 14090:2019).

Financial institutions also are recognizing that investors are looking for sustainability-focused companies and that managing climate change is an important aspect of a company's long-term viability.

For example, BlackRock, the world's largest asset manager, will now require disclosure of climate-related risks and plans for operating under the goals of the Paris Agreement to limit global warming to less than 2 degrees Celsius, from the companies it invests in.

In 2020, the Canadian government required large employers that accessed COVID-19 funding to publish annual climate disclosure reports consistent with international standards, including indicating how their future operations will contribute to achieving Canada's climate goals.

The federal government, through Infrastructure Canada, is now requiring potential projects that it funds must consider and examine the long-term viability of the project through a climate-change lens.

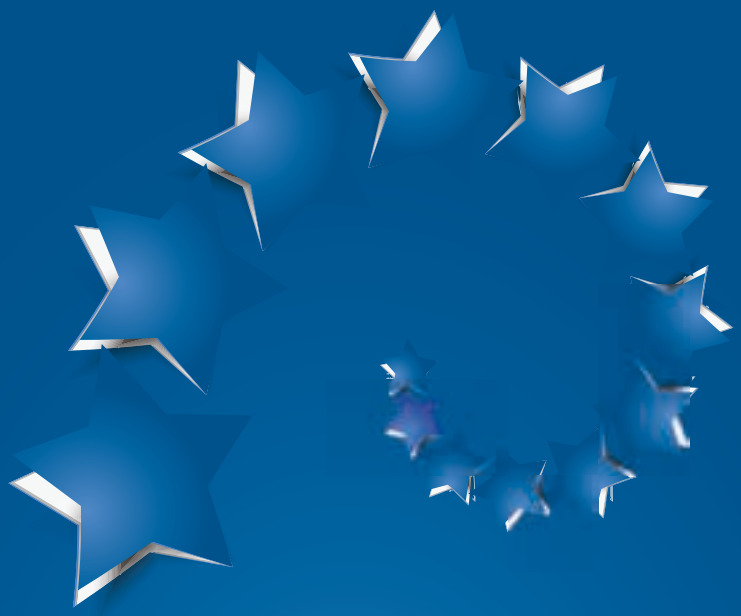
This is also a requirement of provincial governments in British Columbia and Quebec. Edmonton, Calgary and Saskatoon are also making good progress on climate-change adaption.

While Canada ranks 21st out of 162 countries in a 2020 Sustainable Development Solutions Network report in terms of sustainable development, there are many positive developments that are occurring.

There are several organizations whose mandate is to assist communities, government and businesses with understanding the potential impacts and how to respond to them. A couple of prairie-focused organizations are ClimateWest and the Prairie Adaptation Research Collaborative (PARC).

While ClimateWest's mandate is to equip organizations with the information to adapt, PARC's focus is more on research, understanding the data and the range of forecasts and making it usable on a local scale.

There are also professional organizations such as Engineers Canada that have taken a lead on providing information on climate change. In 2015, Engineers Canada launched the Infrastructure Resilience professional designation for Canadian engineers. This designation provides engineers with the additional knowledge and competencies they need to plan, design and manage resilient infrastructure in the face of a changing climate.



APEGS 2021 AWARDS

APEGS celebrated its award recipients with an online ceremony on Friday, April 30 as part of the APEGS 2021 Annual Meeting and Professional Development Conference.

To view the ceremony or separate videos for each recipient, visit apegs.ca, under About Us / Annual Meeting and PD Conference.

Recipients of APEGS 2021 Awards

Brian Eckel Distinguished Service Award
David MacDougall, P.Geo.

Outstanding Achievement Award
Jeff Horan, P.Eng.

McCannel Award – Harold Retzlaff, P.Eng.

Exceptional Engineering/Geoscience Project Award – Blanket of Warmth
MacPherson Engineering.

Environmental Excellence Award
Lyle Hosler, P.Eng.

Promising Member Award
Imteaz Bhuiyan, P.Eng.

Friend of the Professions Award
Ron Genest

The following members received other awards:

Chi Yung Chung, P.Eng., received the Gerry Zoerb Award for achieving the highest mark in the Principles of Professional Practice Exam for 2020.

Andrew Lockwood, 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:

Kwei Quaye, P.Eng., FEC

Catherine Griffith, P.Eng., FEC

Robert Cochran, P.Eng., FEC

Jessica Theriault, P.Eng., FEC

Ondiveerapan Thirunavukkarasu, P.Eng., FEC

Sebastian Walrond, P.Eng., FEC

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

Cory Belyk, P.Geo., FGC

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

BRIAN ECKEL DISTINGUISHED SERVICE AWARD

DAVID MacDOUGALL, P.Geo.

Although David was born in Regina, he grew up and received his education in Britain; first at the Romford County Technical School in Essex, England, then at University College Cardiff, a constituent college of the federal University of Wales.

He graduated with a B.Sc. honours degree in geology in 1970. He did not get back to Regina until 1981 when he took up employment with the Saskatchewan Geological Survey in the Department of Mineral Resources.

Immediately after graduation, David was lucky to find immediate work as a field geologist in the West of Ireland, with Canadian Johns-Manville, the company that employed him as a summer student in Quebec in 1969.

It was in Ireland where he worked for 10 years, married and started a family. During that time, full-time employment with Canadian Johns-Manville changed to short-term contract assignments for that company, including two short seasons in Sudan and work in other parts of Ireland with Maugh Ltd. and Irish Base Metals Ltd.

His work for the Geological Survey was nothing if not varied. After an initial five months working on the Sub-Athabasca core project, he spent a year in Mines Branch clearing the backlog of assessment files that had accumulated during the uranium exploration boom of the previous decade.

His next project was compilation of a Metallogenic Map series. This was interspersed with teaching at the annual Prospectors' School in northern Saskatchewan, preparing exhibits for national and provincial trade shows and scientific conferences and three- to six-week field seasons in the north.

Through his career, David was fortunate to have excellent mentors, whether at university, in industry or in government. He retired in 2007 after 37 rewarding years in geology.

OUTSTANDING ACHIEVEMENT AWARD

JEFF HORAN, P.Eng.

Jeff Horan works as a Division Manager for Associated Engineering (AE) in the Prince Albert office, where he is responsible for co-ordinating staffing and projects for that operation, an office he helped start and grow to more than 15 staff. He was born and raised in Kelvington, SK and is a proud, long-term Saskatchewan resident.

Jeff is an active project manager and engineer with more than 20 years of experience in design and construction of infrastructure, with a heavy focus on roadway projects. Some of his fondest early memories involved tagging along with his father to worksites and getting to ride in and later operate heavy equipment.

Through those early connections, he worked in the late 1990s in the contracting field before returning to school, where he initially completed a diploma from SIAST in 2001 and later a civil engineering degree from Lakehead University in 2005.

Previous to joining Associated Engineering, he spent several years working for the Saskatchewan Ministry of Highways in Saskatoon and Prince Albert as a technologist and engineer.

Since joining AE in 2007, he has had the opportunity to work with all levels of government and the private sector. He has led the design and construction of several hundred kilometres of highway improvements and close to 500 culvert sites across the province.

Jeff actively seeks northern project work and has completed planning for several hundred kilometres of new roads, including new roads to active mine sites and communities. Recently, he had the opportunity to continue working on the Wollaston Lake road project, which is a lifelong goal to complete.

Jeff is a member of the Associated Engineering Group board and is also active on several non-profit boards in Prince Albert. He has resided in Prince Albert since 2005 with his wife Shannon, daughter Kirsten and son Corbin. He is an active outdoors person and enjoys hiking and riding his snowmobile and dirt bike with his kids in the Nisbet forest near his home.

McCANNEL AWARD

HAROLD RETZLAFF, P.Eng.

Harold Retzlaff, P.Eng., graduated from the University of Manitoba with a Bachelor of Science degree in civil engineering in 1982.

Following graduation, he began work with the Saskatchewan Ministry of Highways and Infrastructure. He has been with the Ministry for more than 36 years.

He has held numerous positions with the Ministry, including Construction Project Manager, Design Project Manager, Policy Analyst, Regional Operations Engineer and Testing Standards Engineer. Currently, he is the Senior Project Engineer responsible for the geometric policies, standards and practices.

Harold has been involved with the design and construction of several hundred kilometres of highway, guided the planning for numerous highway corridors and developed policies and standards in geometric design and road safety.

Harold joined the Canadian Society of Civil Engineers (CSCE) in 1998. He worked with the Conference Organizing Committee that hosted the 1999 and 2015 CSCE Annual Conference. In 2000, he joined the local CSCE Section Board and was elected President, a position he holds today.

Harold is a strong supporter of community and church activities. He has been a member of the community recreational soccer board where he has served as secretary and president for more than 10 years. He has also held the role of chair for many committees at his church.

Harold is a registered professional engineer in Saskatchewan.

EXCEPTIONAL ENGINEERING/ GEOSCIENCE PROJECT AWARD

Photo Credit: Lindsey Hoemsen

BLANKET OF WARMTH - MACPHERSON ENGINEERING INC.

On Star Blanket Cree Nation, more than 60 per cent of the homes have thermal comfort and air-quality issues. Wendel Starblanket brought to the attention of MacPherson Engineering his concern for poor air quality and the cold, damp basements on the First Nation.

To address the issues, MacPherson Engineering Inc., made a strategic decision to form an informal partnership with Star Blanket Cree Nation, APEGS, the University of Regina Faculty of Engineering and Applied Science, The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Anaquod Plumbing and Heating, Uponor, Creative Services, Dr. Katherine Arbuthnott, Fries Tallman and United Nation Saskatchewan Regional Centre of Expertise on Education for Sustainable Development.

The goal was to make improvements that were effective, affordable and eco-friendly and to incorporate Indigenous knowledge to create positive social values.

The 'Blanket of Warmth' project concept was to supplement the existing HVAC system with a hybrid radiant heating system that could take advantage of the thermal mass of a basement's concrete floor and walls in a similar manner to how the teepee used rocks around a fire to store and release radiant heat.

The 'Blanket of Warmth' project broadened Indigenous knowledge of the teepee and used five of the 17 sustainable development goals of the United Nations: Goal 17 Partnership, Goal 12 Responsible Consumption and Production, Goal 9 Industry, Innovation and Infrastructure, Goal 3 Good Health and Well-Being and Goal 4 Quality Education.

It was on Dr. Amr Henni's suggestion that this had the makings of a Capstone final-year student project where two existing Star Blanket Cree Nation homes could be compared; one with the hybrid heating system installed and one with a conventional HVAC system.

The following was achieved:

1. Compliance with ASHRAE Standard 55.
2. Saving the occupant $780 per year on power bills.
3. Added 900 square feet of livable space.
4. Implemented solutions that are cost effective (the payback period is 9.6 years).
5. Utilized the thermal mass of the home to provide 12.9 hours of built-in energy depletion to build adaptation and resilience during future power outages.
6. Removed the need for electric space heaters that, according to the National Fire Protection Association, cause 79 per cent of deadly home heating fires.

An article in *The Professional Edge* of July/August 2019 by Dr. Esam Hussein, P.Eng., titled *Compassionate Professionalism and Social Sustainability* closes with I have posed here more questions than answers, in the hope of generating a debate within the profession. What a better place to start this conversation than in Saskatchewan…"

Infusing the United Nations 17 sustainable development goals with Indigenous ecological knowledge is the pathway forward to build back better. It started in Saskatchewan with compassionate professionalism and social sustainability.

ENVIRONMENTAL EXCELLENCE AWARD

LYLE HOSLER. P. Eng.

Lyle was born in July 1955. Five months later, his father gave up farming after two consecutive crop failures due to record flooding. Water management became Lyle's lifelong pursuit. After graduating in 1980, he started work at Nipawin's Saskatchewan Agriculture Conservation and Development (C&D) Branch. This office had been the training ground for many engineers working on flood-control projects since the 1950s. Lyle gained valuable knowledge from the experienced staff.

Canoeing became a passion shortly afterwards. For the past 20 years, Lyle has enjoyed canoe trips regularly lasting seven to 10 days in northern Saskatchewan.

Between 1980-2002, his work with Saskatchewan Agriculture, Saskatchewan Water, Saskatchewan Watershed Authority and the Water Security Agency mostly involved flood-control and erosion issues, including design and construction.

The flood-control projects needed grade control structures like flax straw/rock drops, rock chute drops, sloping pipe drops, vertical pipe drops, grassed runways and reinforced grassed runways.

Later, Lyle worked with fishery biologists on several rock chute fishways at provincial dams and structures at a handful of lakes. During his work on various Water Security Agency dams - Lac La Ronge, Lac La Plonge, Theodore, Cowan and Makwa - he developed a good working relationship with Department of Fisheries and Oceans staff.

Lyle attended Bob Newbury's five-day river course in Cypress Hills in 2001. In 2011, he attended his Stream Restoration Hydraulics course.

From November 2011 until his retirement in January 2017, Lyle worked on restoring the Upper Qu'Appelle Channel. Over this time, Lyle and Jeff Sereda, a fish biologist, became close workmates, as Dr. Newbury strongly recommended that biologists and engineers work together for a successful river channel design.

Lyle's passion for canoeing contributed greatly to his understanding of differences between flood-control channel design and river hydraulics, thus resulting in a successful design for the Upper Qu'Appelle.

Lyle is married to Donna Miniely and lives a happy retirement life in Nipawin. He is a father to Amanda and Jason, step-father to Chinonso and grandfather to Elly, Archer, Cooper and Theo.

Lyle was a Scouts leader for 15 years. His lifetime highlights were attending a World Scouting Jamboree in Chile and two Canadian Jamborees. Lyle believes the easiest way for a person to be concerned about the environment is to teach them to canoe, which Scouts groups experienced.

Lyle was president of the Nipawin Lions Swim Club for 11 years and served on Swim Saskatchewan Executive for seven years.

PROMISING MEMBER AWARD

IMTEAZ BHUIYAN, P.Eng.

Imteaz Bhuiyan, P.Eng., is a professional engineer and holds a permission to consult in civil and geotechnical engineering with APEGS. Imteaz was born and raised in Bangladesh. He moved to Regina in 2012 to complete his graduate studies. Imteaz and his wife Asma are parents of two boys. Imteaz refers to himself as a happy engineer who often dares to dream big.

Since 2013, Imteaz has been working in the technical services division at the Water Security Agency (WSA).

In early 2021, Imteaz moved into a new role at the WSA as the Manager of Geotechnical Engineering. Currently, Imteaz leads a team of engineers and technologists to deliver geotechnical services for dams and water management infrastructures across the province.

Imteaz is a lifelong learner and avid volunteer. He served in several volunteer leadership roles for the Canadian Society for Civil Engineering, Canadian Geotechnical Society and Canadian Dam Association. Imteaz also volunteered in events organized by APEGS and the University of Regina.

At the University of Regina, he was the vice-president of Student Affairs for the Graduate Student Association. He also served as a member of the council discipline committee for the President's office.

Imteaz published several engineering articles in numerous international journals and conferences from his research work and engineering experiences.

For his academic achievements and research innovation, Imteaz was awarded by the City of Regina in 2012 and by the Government of Saskatchewan in 2013. For his significant contributions in teamwork, he was awarded corporately by Water Security Agency in 2019 for cultural excellence in communication and collaboration.

FRIEND OF THE PROFESSIONS

RON GENEST

Ron was born, raised and educated in Harris, Sask. He met his wife Peggy in 1965 when he was working on his first highway construction project. They have been together ever since. They have four children and eight grandchildren.

Ron worked 41 years at Saskatchewan Highways. He started in field surveying and soil and asphalt testing.

He then served as lab manager until 2003 and sampled and tested highway construction and maintenance materials, performed asphalt mix and structural designs and helped with design and construction of five central and several field labs.

The final three years on the job were spent as the provincial asphalt mix /paving specialist. He attended all paving jobs at startup to try to restore the quality that had deteriorated for some years.

Since retirement, Ron has contracted with MDH, SNC-Lavalin, Soli Solutions and others and assists with lab setup, technician training and project startup.

Ron served as a testing auditor on the Centre Port Canada Way in Winnipeg and design/ build highway projects in Saskatchewan.

He was pleased to be part of the pursuit teams on two major P3 projects - the Regina Bypass and the George Massey Tunnel replacement in Vancouver.

Ron's exposure to engineering and testing helped him to serve on Village council for the past 39 years and 21 years as mayor.

He holds certificates in Level 1, Level 2 and wildfire fighting and Level 1 water/ wastewater treatment. He has held executive positions on numerous boards, committees and the Harris Lions Club.

His hobbies include hunting, fishing, camping, snowmobiling and attending his grandchildren's activities.

News Beyond Our Borders

cbc.ca

Geophysicist leading way to greener lithium mining

CBC Calgary - Amanda Hall, an accomplished geophysicist, recently began looking into a better, greener way to mine lithium - the essential ingredient in lithium-ion batteries, which power electric cars and smartphones.

This led to her founding the company, Summit Nanotech in 2018 and developing nanotechnology, which works with materials at the molecular or atomic level to selectively filter lithium out of the wasted saltwater brine used in oil wells.

It's completely different from the way lithium is traditionally mined.

Lithium is usually mined through hard rock mining - where the rocks are ground up and dissolved - or through brine mining, which is similar to drilling a well.

However, Hall's method goes a different way.

"It's a seven-step process that goes from raw brine all the way to a high-purity, battery-grade end product," she said. "We could take that end product and ship it to a battery manufacturer and they could put it into a battery."

"And we really focus on ESG (Environmental, Social, and Governance) being an important part of the extraction process … these days, it's future-proofing your company if you prioritize environmental processes when you're doing resource extraction."

Hall plans to develop the methods in Calgary and then take it further afield a target market in Chile, South America.

Summit Nanotech is still in the development phase. It has already attracted the interest of billionaire entrepreneur Elon Musk.

Calgary company mining low-cost, green energy from aging oil wells

Calgary Herald - Many depleted oilfields were shut down because the easy oil had been extracted. Companies see them as a cleanup problem, but chair and CEO Grant Strem and his team at Proton Technologies see them as a harvest of hydrogen gas that offers a huge opportunity to produce a clean, low-cost energy.

Using its game-changing technology, his company has found a way to leave harmful emissions and carbon in the ground and extract only pure hydrogen.

Pure oxygen is injected into the ground to induce a series of reactions that heats up the oil and releases hydrogen. By using a palladium-alloy membrane, only hydrogen can get through. It is pulled to the surface leaving everything else in the ground.

Strem says it's actually an old process that has been used to heat underground oil to make it flow better, but operators didn't notice or didn't care about the hydrogen in their haste to fill barrels.

Initially, the hydrogen will be transported to Proton's customers by truck. As more is produced, the company plans to blend the hydrogen into natural gas pipelines, making it easier to use for heating homes or for power generation.

Commercialization of Proton's hydrogen is well underway and the company has secured licence agreements with companies in 11 countries.

Vital Metals becomes Canada's first rare earths miner

www.tetratech.com

Mining.com - Australia's Vital Metals is getting ready to kick off mining operations at its Nechalacho rareearths project in Canada's Northwest Territories, which will make it the country's first producer of the elements used in magnets for electric vehicles, aerospace, defence and electronics.

The Sydney-based company, which will also be the second rare-earths miner in North America, said the mining fleet had been mobilized to the site in early April. It noted that mining contractor Det'on Cho Nahanni Construction started operations shortly thereafter.

The product will be sent for further processing at a rare-earth extraction plant to be built in Saskatoon.

The contractor is expected to undertake mining and crushing in a single campaign between March and September this year, with mined ore to be stockpiled for use in ore sorting operations between 2021-23.

Vital aims to produce a minimum of 5,000 tonnes of contained rare earth oxide by 2025.

Carleton University launches unique program

Carleton University

Education News Canada - Carleton University announced the launch of a new Women in Engineering and Information Technology (WiE&IT) Program - one of the first industry- and government-sponsored programs of its kind in Canada.

Spearheaded by the Faculty of Engineering and Design, with financial support from nine industry and government partners, the WiE&IT program will provide key learning and development opportunities for undergraduate and graduate-level women students within Carleton's array of engineering and information technology programs.

Beginning in fall 2021, the program will include events to foster relationship building and mentorship, a network of ambassadors and volunteers and a special fund to support the work of allies in meeting their equity, diversity and inclusion goals.

By taking part in the WiE&IT program, students will be introduced to women role models, gain an inside look into workplaces, attend industry talks and develop connections with women ambassadors.

Consolidated effort in carbon-capture infrastructure

Energy Voice - A number of the oil and gas industry's biggest players have joined forces to speed up the decarbonization of industry and power.

The North Endurance Partnership (NEP) brings together BP, Eni, Equinor, Shell, Total and National Grid with the aim of developing offshore carbon dioxide (CO_2) transport and storage infrastructure in the U.K .North Sea.

The initiative will aid plans to establish decarbonized industrial clusters in the north-east of England as part of the proposed Net Zero Teesside (NZT) and Zero Carbon Humber (ZCH) projects.

Both schemes aim to go live by 2026 with the goal of achieving net zero as early as 2030 through a combination of carbon capture, hydrogen and fuel-switching.

If successful, it's claimed NEP, which is being headed up by BP, will decarbonize almost half of the U.K.'s industrial emissions.

CO_2 emissions will be transported from NZT and ZCH via an offshore pipeline network to offshore geological storage ducts beneath the U.K. North Sea.

Stantec recognized as a Top 50 STEM workplace for Indigenous professionals

themuse.com

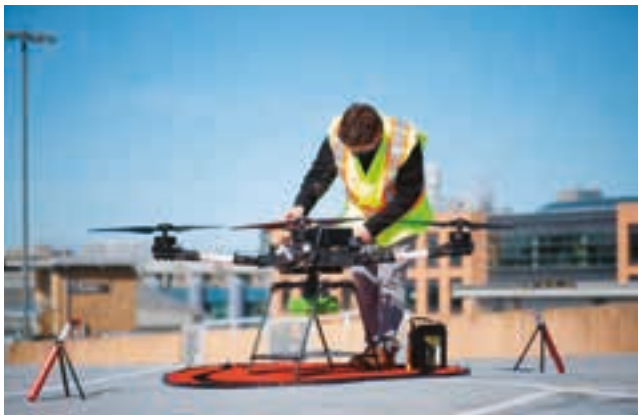
Engineers Canada - For the second consecutive year, Stantec - a global architecture, engineering and design firm - has been recognized by the American Indian Science and Engineering Society (AISES) as one of the Top 50 STEM Workplaces for Indigenous STEM Professionals.

AISES released its listing in the Spring 2021 issue of Winds of Change, the organization's national magazine, which focuses on advancement for Indigenous Peoples of North America and the Pacific Islands in science, technology, engineering and math (STEM) studies and careers.

Firms selected for the AISES Top 50 list are required to meet a list of criteria, including: diversity recruitment efforts; recruiting for jobs in the STEM fields; and actively recruiting within Indigenous audiences sustained support of the AISES mission.

Among companies named to the Top 50 list are those focused on aerospace, civil, electrical and mechanical engineering; biology; ecology; computer science; and engineering and mathematics.

Canada's first 5G drones take flight



UBC Applied Science

UBC News - Canada's first unmanned aerial vehicle (UAV) flights over a 5G network took place at UBC in April, showcasing some of the future potential applications of 5G-enabled autonomous flight.

Two UAVs - standard quad models fitted with a 5G signal transmitter receiver - were put through their paces using UBC's 5G network, installed by Rogers as part of a multi-year collaboration to pursue 5G research.

The drones performed precise flight manoeuvres relying on the 5G network alone, without additional navigation from ground operators and completed tasks like picking up and dropping off a box containing medical first-aid supplies at a designated location. Drones usually communicate using radio frequencies, with 5G significantly enhancing their capabilities.

The ability to have data and video shared live from the drone across 5G to multiple users in other locations allows many new uses.

For example, engineers in their office can inspect critical infrastructure in the field. First responders can share images and the ability to control the drone or camera from an off-site command centre. The next step, control of multiple drones at the same time over the 5G system, will expand its use.

Creating the most intelligent maps in prairie history

UM News - Two University of Manitoba engineers are embarking on a novel project to create maps no one has ever seen.

The first phase of the project will apply artificial intelligence (AI) to improve the resilience, fluidity and safety of road freight transport in the Canadian Prairie and the northern region by cataloguing truck routes and activity.

Data will be collected on the number, type and weight of trucks using roadways and how they collectively behave under various road-weather scenarios. Such data is lacking in Canada and most of the world.

www.hiringlab.org

The second phase will directly involve experts from the NRC's Digital Technologies Research Centre and will build on the first-phase collaboration with experts from Manitoba Infrastructure and International Road Dynamics, a Saskatchewan-based ITS (Intelligent Transportation Systems) company. This phase will create the first-ever models of Prairie provinces' road logistical networks.

The new models will reveal what the crucial networks are, their weaknesses and what consequences arise when catastrophic risks become reality.

AI techniques will enable data-driven models that will uncover various factor relationships in scenarios of interest, benefit from historical data and generate complex scenarios that would not otherwise be possible.

These models can then be updated when new data is added and will be very useful in decision- making. The project will provide federal and provincial governments with the data they need to make informed decisions.

Thailand floats hydro-solar projects for its dams as fossil fuel supplement

www.pattayamail.com

Reuters - Thailand is close to completing one the world's biggest floating hydro-solar hybrid projects on the surface of a dam, a step toward boosting renewable energy production after years of criticism for reliance on fossil fuels.

Approximately 144,417 solar panels are being installed on a reservoir in the northeast province of Ubon Ratchathani, where workers are completing the last of seven solar farms covering 300 acres (121 hectares) of water.

The state-run Electricity Generation Authority of Thailand (EGAT) is touting the pilot project as one of the world's largest hybrid hydro-solar power ventures and aims to replicate it at eight more dams over the next 16 years.

When all the projects are completed in every dam, it will have total capacity to generate 2,725 megawatts.

Thailand has long relied on coal for power. But plans for new coal-fired projects have been met with opposition over health and environmental risks.

It is aiming to draw 35 per cent of its energy from non-fossil fuels by 2037.

An Energy Management System will be used to switch between solar and hydropower, depending on which can generate more electricity, a hybrid system that allows continuous power generation.

Canadian ingenuity gets us closer to Mars

nasa

Global News - Farah Alibay is living her dream to unlock the mysteries of Mars. But the 28-year-old Canadian engineer is also helping to chart a new path in aviation history - and doing it on another world.

Alibay is part of a team of engineers that designed and tested a space helicopter, nicknamed Ingenuity, that took flight over the red planet in April.

It is a major first in space exploration - namely, the first time an autonomous aircraft has ever taken flight on another planet.

Ingenuity was affixed to the Perseverance rover that landed on the red planet on Feb. 18. In March the chopper emerged from the belly of the rover and is now operating on its own.

Detached from the rover, the helicopter, which weighs less than two kilograms, had to survive temperatures that dip to -90 Celsius, drawing upon enough of its own stored energy to remain functional.

Building a machine that can stay warm and power itself up enough to fly under those conditions - 272 million kilometres from Earth - is not easy. That, and the fact that Mars' atmosphere is just one per cent as dense as the Earth's, makes it extremely challenging to build a flyable helicopter.

Ont. government helps fund junior exploration

www.mining.com

Mining.com - The Ontario government launched a new program to fund junior exploration in the province and increased financial support for the Ontario Mine Rescue program.

The province's 2021 budget sets out $23 billion in spending targeted at bolstering the provincial economy.

As part of the government's plan to increase jobs and economic activity in northern Ontario, the budget set out $5 million over the next two years for the new Ontario Junior Exploration Program. Under the program, junior mining companies can apply for funding to cover eligible costs up to a maximum of $200,000 per exploration or development project.

First Nations propose new energy corridor

CBC - First Nations leaders in Western Canada are proposing a corridor for transporting commodities from the region and possibly to the West Coast.

The goal is to establish a route for pipelines or rail lines to ship oil and other materials.

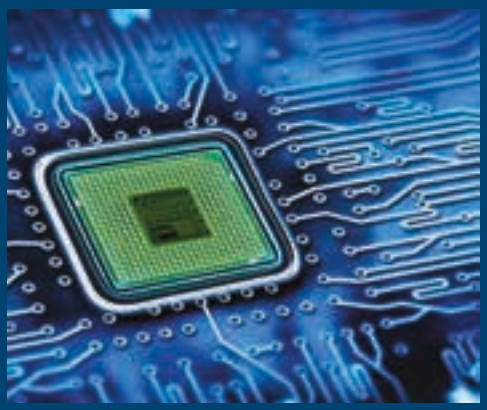
Treaty 8 leaders, who represent 40 First Nations in Alberta, Saskatchewan, British Columbia and the Northwest Territories, are talking with provincial and federal government ministers about the proposal.

The route is still under discussion, but access to the West Coast is a priority so commodities can be exported. That would require working with coastal communities outside of Treaty 8.

Leaders say they would require the highest environmental protection for their land, while also ensuring a benefit to all people belonging to Treaty 8.

The Treaty 8 leaders say their corridor could provide access for a number of different projects, such as electricity transmission lines and fibre-optic cables.

News From the Field



DW.com

ENERGY

Sask. REE facility expected to secure supply chain

CJME - A recent global shortage of computer chips and semiconductors has people looking to an upcoming facility in Saskatoon as part of the solution.

University of Saskatchewan geological sciences professor Kevin Ansdell, P.Geo., FGC, FEC (Hon.), said while rare-earth elements are more common than elements like diamond or gold, they will become more important as more products depend on them.

Nearly all of the processing and mining of rare-earth elements is done in China.

Ansdell said China's corner on the market creates conditions that make it far too expensive to try to begin exploration or mining of rare-earth elements when you can access the supplies from China.

The recent computer chip shortage has shown how delicate that relationship can be when access is limited.

A new supply chain could run through Saskatoon as early as next year.

The Saskatchewan Research Council is building a rare-earth element processing facility in Saskatoon. The facility is expected to be operational by the end of 2022. It will be the first rare-earth element processing plant in North America.

U of R launches Canadian Energy Transition Hub

Discourse Magazine

Discourse Magazine - Achieving net-zero carbon emissions by 2050 will take significant expansion of low-carbon energy technologies that will require collaborations between researchers, government, industry, the public and communities.

To help meet Canada's climate-change goals, the University of Regina has launched the Canadian Energy Transition Hub (CETH), a key part of the country's clean-energy solution.

Residing within the university's already-established Clean Energy Technologies Research Institute (CETRI), CETH is a partnership- and relationship-building hub that will connect government and industry with research.

Hussam Ibrahim, P.Eng., University of Regina associate professor of engineering and director of CETRI, said the hub will focus on research areas such as carbon capture, utilization and storage, nuclear energy, hydrogen energy and renewable energy.

"Our team will facilitate connections between the supply and demand sides of the energy transition equation," Ibrahim said. "If you are in the energy industry and have an energy transition-related problem to solve or opportunity to pursue, then our hub will connect you with researchers who have expertise across a wide spectrum of disciplines as well as the research infrastructure at the laboratory, pilot and demonstration scale."

Hub researcher and U of R geologist Janis Dale, P.Geo., has been working on geothermal energy processes for decades.

"Our geothermal working group is expanding our expertise in harnessing geothermal potential with a working geothermal facility on campus that will serve as a living lab for research and training of future highly-qualified workers in the field."

Dale adds that the team behind the geothermal demonstration project will help address specific industrial challenges, as well as champion and encourage the use of geothermal in Saskatchewan by exploring its potential to produce electrical energy and its applications as a direct-use source in heating air and water in commercial, industrial and residential applications.

Ibrahim said that geothermal is just one example research area for which industry may reach out to the hub. He added that the U of R's research will also assist industries that support coal, oil and natural gas resources to meet greenhouse gas emissions targets.

Report sees first SMR in Sask. in 2032

Regina Leader-Post – There's a tentative plan to bring a small-modular nuclear reactor to Saskatchewan, the first of four that could be built over a decade to generate 1,200 megawatts of emissions-free power.

That's according to a feasibility study on the nascent technology by SaskPower, along with utilities in New Brunswick and Ontario. It's part of the process launched by a memorandum of understanding between three provinces. Alberta joined in mid-April.

Small-modular reactors differ from traditional power plants in their compact and modular form, which allows provinces to deploy them more easily and scale up as needed. The report confirms they have the potential to be "an economically competitive form of energy," though much hinges on prices for alternatives and prospects for federal support.

It lays out a detailed and still tentative schedule for bringing the reactors to Saskatchewan. SaskPower expects to finish an evaluation and make a recommendation on whether to proceed this year.

A site selection and various regulatory steps would follow. Construction would take about three years, with the reactor ready for business in 2032. Three more would be slated to follow in stages by 2042.

Such reactors would produce about 300 megawatts of electricity each. The report estimates the four units would create more than 700 jobs during development, more than 7,000 during manufacturing and construction and more than 700 during operation of the reactors.

SaskPower unveils battery energy storage system

Swift Current Online - SaskPower's first ever utility-scale battery energy storage system will support its plans to lower greenhouse gas emissions.

The battery energy storage system will provide storage for energy to help balance SaskPower's power system when there's a spike in demand. It's going to help support intermittent generation options (wind and solar power).

SaskPower is to add 685 megawatts of new wind capacity and 60 megawatts of solar in the next few years. Currently, SaskPower does not have batteries that are storing power.

The battery storage system will be installed in Regina.

SaskPower

Construction will start this summer and be completed by the end of 2022.

SaskPower has set a target to reduce carbon emissions at least 40 per cent below 2005 levels by the year 2030.

Renewable canola diesel the future for Estevan?

/leaderpost.com

Globe and Mail – Estevan Mayor Roy Ludwig hopes a proposed renewable diesel refinery in the area helps his city secure long-term jobs.

Two coal-fired units at SaskPower's Boundary Dam are to close this year and in 2024. That's why Estevan is working with Covenant Energy for a large renewable diesel refinery in the area.

Thanks to a provincial funding pot of $8 million over three years, the city and nearby communities have provided Covenant with $200,000 to do a feasibility study for the refinery.

The refinery could process 6,500 barrels of renewable diesel per day.

Renewable diesel is different from biodiesel. Both use oil from crushed canola seeds, but renewable diesel refines the oil in a process resembling what's done with fossil-based crude.

It means there's little oxygen left in renewable canola-based diesel, which allows it to be used in sub-zero temperatures. The refining process uses hydrogen and a catalyst.

By using canola oil as a starting point, there's no ash or metals left in a vehicle's engine when it burns the refined product.

Based on Covenant's initial research, the company said the facility will yield greenhouse gas emission reductions in the range of 80 to 85 per cent when compared to fossil-fuel diesel. It's also to use recycled hydrogen in the refining process.

The projected start year is 2023.

ENVIRONMENT

Carbon-capture contest offers motivation

www.cbc.ca

CBC Saskatchewan - A Saskatchewan researcher says he's glad to see one of the world's richest people making a major investment in research and development of carbon emissions technology.

Tesla co-founder and SpaceX CEO Elon Musk announced he and his charity foundation will spend $127 million on a contest that will see researchers create projects to pull CO_2 out of the air or ocean.

"I'm a bit surprised, but I'm really happy that he's coming around to this kind of issue," said Raphael Idem, P.Eng., a University of Regina engineering professor and the SaskPower clean energy research chair at the university.

The non-profit XPrize, which is organizing the carbon-capture competition, said the contest will run for four years.

Projects will be evaluated based on factors like how much CO_2 is removed, energy efficiency and how long carbon dioxide can be stored.

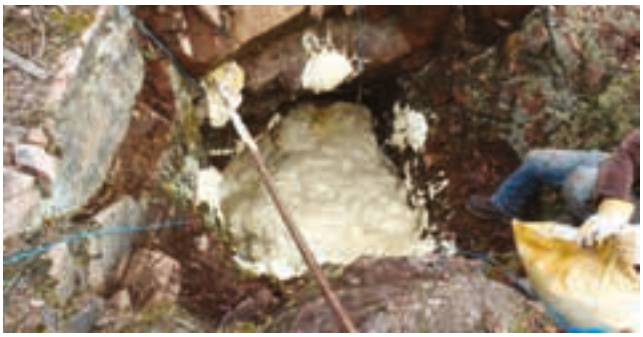
After 18 months, the top 15 teams will get $1 million in funding, and 25 student scholarships for $200,000 each will be awarded to student teams.

Following that, the grand prize winner will get $50 million, with the runners-up getting $20 million and $10 million.

A push to clean up more abandoned mines

Saskatoon Star Phoenix - The Saskatchewan government is looking to clean up six non-uranium mines that operated decades ago in the province's north and were subsequently abandoned.

The project is in addition to a joint federal and provincial



www.src.sk.ca

effort to remediate the Gunnar uranium mine and associated sites, which has seen massive cost overruns and a long dispute over how to split the bill.

Government documents show that, since 2019, the provincial cabinet has authorized spending at least $504,000 for SNC-Lavalin Inc. to study the Newcor and Western Nuclear mines, both former underground mine sites near Creighton, which have been identified as high priority.

That includes $104,000 approved in February to address costs created by the COVID-19 pandemic.

Studying all six sites is expected to take six years, wrapping up in 2025 and cost around $1.2 million.

The project has its roots in a cataloguing of abandoned mine sites conducted two decades ago. That also led to the Saskatchewan Research Council undertaking cleanup of derelict uranium mine sites.

Solar energy project planned for RM of Weyburn

Weyburn Review - The Pesakastew Solar Project is ready for construction this spring in the RM of Weyburn.

The project has three main partners, including Natural Forces, a private independent power producer, plus two First Nations partners: George Gordon Developments Ltd., owned by George Gordon First Nation. Red Dog Holdings Ltd., owned by the Star Blanket First Nation, is the third partner.

The development and construction of the solar project is being done by Natural Forces.

Southern Saskatchewan has some of the highest exposure to sunlight in Canada, making this location ideal for a solar-energy project.

The finished project is expected to produce 10 megawatts. The project will have a line to the SaskPower substation, where the power will go directly onto the power grid. It was one of the reasons this site was selected as no additional infrastructure was needed to enable this project to supply the power.

This project will see power produced from 32,000 bifacial solar panels installed in a 90-acre area, bounded by a fenced-in area of 107 acres located southwest of Weyburn.

The panels will be mounted onto 1,280 trackers, which will

allow the panels to move east to west following the sun during the day to get the maximum amount of sunlight each day.

Construction was scheduled to begin in May and completed by November. Interconnection will likely occur in December with the substation.

INFRASTRUCTURE

www.kindersleysocial.ca

SaskTel to invest in telecom infrastructure

Martin Charlton Communications - SaskTel is investing nearly $323 million in infrastructure upgrades in Saskatchewan for 2021-22 and more than $1.4 billion over the next five years.

The Crown corporation provides residents in the province with wireless, television, internet, data and business support services.

Broken down, $85.8 million is going toward the Fibre to the x (FTTx) program, $95.9 million for wireless network enhancements, $75.4 million on wireline network growth and enhancements and $66.1 million is being used to improve customer services and operations.

Investing in green infrastructure

www.picfair.com

Radio Canada - The governments of Canada, Saskatchewan and Saskatoon announced a joint investment of more than $102 million toward 11 green infrastructure and COVID-19 resilience projects.

According to Infrastructure Canada, the green infrastructure projects include upgrades to drinking water and wastewater systems, improvements to solid waste management and a new solar-power plant.

Three of the projects will be funded through Canada's COVID-19 Resilience Stream, which is a fund that was created by the federal government for pandemic-related projects.

SaskPower renewing aging grid infrastructure

Regina Leader-Post - SaskPower is spending a record $272 million on upgrading its infrastructure this fiscal year, partly in a bid to prevent power outages that have struck the province in recent years.

A $50-million government capital grant is helping to boost the investment. It will pay for power grid renewal to improve aging transmission and distribution infrastructure.

The largest share of the money, $97 million, will go toward transmission line and station refurbishment and upgrades. A total of $35 million will rebuild about 700 kilometres of rural power lines. Another $26 million will fund replacement of about 8,500 poles.

The total spending this year is up 62 per cent above the five-year average.

The areas of Lumsden, North Battleford, Melville, Yorkton and Prince Albert will be among those to benefit. Regina will get underground cable replacements and wildlife protection on equipment.

The government said that about two-thirds of the work will be done by Saskatchewan contractors, with the rest covered by SaskPower crews. It estimates that will create about 120 to 150 jobs.

MINING

Nutrien to cut GHG emissions

Nutrien

Reuters - Canadian fertilizer producer Nutrien Ltd., said it aims to achieve at least a 30-per-cent reduction in greenhouse-gas emissions by 2030, the latest company seeking to tackle climate change.

The company estimated capital investment requirements of between $500 million and $700 million to meet the carbon-emissions target.

The Saskatoon-based company, which will deploy wind and solar energy at four potash plants by the end of 2025, will invest in new technologies and tap into low-carbon fertilizers.

Agricultural companies, including Mosaic and Corteva, have set up carbon-emissions targets as increasingly climate-conscious investors push firms to be environmentally friendly.

Cameco restarts Cigar Lake uranium mine

Saskatoon Star Phoenix - Cameco Corp. resumed uranium production in April at its flagship mine in northern Saskatchewan, which was shut down due to COVID-19 late last year.

Cameco CEO Tim Gitzel said enhanced safety protocols, including distancing on flights to the remote site, medical-grade masks and on-site testing, have been implemented in recent months.

Cameco "will not hesitate to take further action if we feel our ability to operate safely is compromised due to the pandemic," Gitzel added.

Around 640 employees and contractors split across two shifts work at Cigar Lake when it's in production, a figure cut to around 120 during the suspension.

Cameco said each month of the shutdown was expected to cost upwards of $10 million. Ongoing uncertainty did not allow it to provide a 2021 forecast for its uranium operations.

The company suspended production at Cigar Lake in March 2020, shortly after the first COVID-19 case was reported in the province.

Cigar Lake was restarted in the fall, only to close in December, again due to the virus.

Uranium industry reflects on Fukushima disaster

Saskatoon Star Phoenix - It was March 11, 2011. Disaster had struck Japan.

A decade later, the reverberations from the most powerful earthquake ever recorded in Japan are still felt by Saskatchewan's uranium industry.

The resulting tsunami affected the nuclear industry because the six-reactor Fukushima Daiichi Nuclear Power Plant was directly in its path.

Flooding caused power failures, including to the pumps responsible for circulating coolant through the reactor cores. That triggered a series of explosions and core meltdowns that resulted in massive releases of radiation.

The disaster led to the shutdown of every reactor in the country, each of which required nuclear fuel. Only a handful have been restarted.

Those shutdowns, coupled with other countries' resulting leeriness of nuclear power, created a large surplus of uranium on the market, causing prices to tumble.

In response, Cameco closed its aging Rabbit Lake mine in early 2016. Two years later, the Saskatoon-based company put its McArthur River mine and Key Lake mill into care and maintenance mode until prices recover.

Orano has stakes in McArthur River and Key Lake and runs the McLean Lake mill, which processes ore from Cameco's flagship Cigar Lake operation, where work has been suspended since late last year due to COVID-19.

Altogether, hundreds of jobs have been lost, many of them in northern Saskatchewan.

Upgrade planned at Chaplin plant

saskatchewanminingandminerals.com

World Fertilizer.com - Construction is planned for a $220-million sulfate of potash (SOP) fertilizer production upgrade at Saskatchewan Mining and Minerals Inc.'s (SMMI) Chaplin sodium sulfate plant.

Construction is scheduled to begin in late 2021. The upgraded facility is expected to be complete by the end of 2023 and will produce 150,000 of SOP.

Construction on the upgrade is expected to take up to two years. Once complete, the addition of SOP production will result in an estimated 50-per-cent increase in jobs at the Chaplin facility on an ongoing basis.

This facility upgrade is planning to implement a cutting-edge design and technology - the first of its kind in Canada - that promises to be up to 25 per cent more energy efficient than the technology currently being used to produce SOP.

Sask. remains mining hotspot

Fraser Institute - Saskatchewan remains Canada's most attractive jurisdiction for mining investment, finds the Annual Survey of Mining Companies released by the Fraser Institute.

This year's report ranks 77 jurisdictions around the world based on their geologic attractiveness (minerals and metals) and government policies that encourage or deter exploration and investment.

Again, on the report's Overall Investment Attractiveness Index, Saskatchewan remains the top-rated Canadian jurisdiction (third, up from 11th in 2020) followed by Quebec (sixth) and Newfoundland and Labrador (eighth).

However, Quebec's strong performance in overall investment attractiveness is due largely to the province's mineral potential. On government policy alone, Quebec ranks 17th, which suggests there's plenty of room for improvement.

British Columbia and Ontario (two large mining provinces) also perform poorly on the policy front due to investor concerns about disputed land claims and protected areas.

UNIVERSITY

Agri-food innovation on the rise

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USask News - The Canada Foundation for Innovation (CFI) will invest $3.2 million in a unique biomanufacturing facility at the University of Saskatchewan that will use cutting-edge engineering biology technologies to accelerate agri-food innovation and help address food security needs.

Developing canola varieties more resistant to climate change, flavourings for the plant-based meat industry and non-animal enzyme alternatives for the dairy industry are a sample of the innovations to be advanced by the new Engineering Biology Agri-food Innovation Centre within the university's Global Institute for Food Security.

Engineering biology is an exploding new field that combines genomics and molecular biology with high-performance computing, automation and artificial intelligence, potentially transforming what we eat, medicines we take and fuels we use.

The CFI funding, made through its Innovation Fund, will be used for critical infrastructure including robots, computers, cell culture systems and other equipment for the centre.

Marrying biological science with the power of automation and computers will enable scientists to run many tests in parallel, rather than manually conducting them one at a time, enabling the rapid production and testing of thousands of gene and protein variants for development of new products and plant varieties.

A passion for sustainable innovation

USask News - Electrical engineering student Samia Sami received the 2021 Global Citizen Youth Award from the Saskatchewan Council for International Cooperation.

Sami is pursuing a degree in electrical engineering at the University of Saskatchewan (USask). By specializing in power and energy, she combines her passion for the environment with a love of design and technology.

Sami conducted two research projects in renewable energy, including the use of artificial intelligence to predict the security status of renewable microgrids in remote communities across Canada and has received the People's Choice Award in recognition of her research.

As a USask delegate, Sami recently presented her research at the Women in Science and Engineering National Conference in Toronto.

She has been selected from Canada to be the 2020's Top IEEE Power and Energy Society Scholar. As a Chair of IEEE Power and Energy Society Student Chapter at USask, Sami is committed to providing an international platform for post-secondary students to advance their careers and education in sustainable energy.

Sask's first satellite passes milestone

USask News - A group of University of Saskatchewan students developing the province's first cube satellite (RADSAT-SK) is getting closer to sending their project into orbit.

In recent months, the student team successfully completed a critical design review of the satellite with the Canadian Space Agency and the construction of the first satellite-grade clean room in the USask College of Engineering building.

For the past three years, more than 100 USask undergraduate and graduate students have been part of the mission to design, build and launch RADSAT-SK. The small satellite is entirely designed by the student team, with minimal faculty oversight.

The cube satellite is expected to launch in late 2022, making it Saskatchewan's first satellite in space. During the one year it will spend in orbit, the satellite will validate a new kind of radiation sensor and test an experimental radiation-blocking compound – both developed by researchers at USask.

Calendar of Events

2021 ACEC-SK AGM and Keynote Speaker
June 11, 2021
https://www.acecsk.ca/events/2021_acecsk_agm__keynote_ speaker.html

CIM Symposium 2021 – Online Event
June 14-16, 2021
https://rouyn-noranda2021.cim.org/registration/

ASHRAE Virtual Annual Conference
June 28-30,2021
https://www.ashrae.org/conferences/2021-annual-conference

The 60th Conference of Metallurgists – Virtual Event
August 17-19, 2021
https://com.metsoc.org/#

2021 ACEC-SK Annual Golf Tournament
August 20, 2021
https://www.acec-sk.ca/events/2021_acecsk_annual_golf_tournament.html

Virtual GeoConvention 2021
September 13-15, 2021
https://geoconvention.com/

Law and Ethics Seminar
September 17-18, 2021
https://www.apegs.ca/Portal/Pages/event-details-7/97793

CIM - Strategic Mine Planning with New Digital Technologies, Risk Management and Mineral Value Chains
September 29-October 1, 2021
https://www.cim.org/professional-development/mcgill-professional-development-seminars/strategic-mine-planning/

National Professional Practice Exam (NPPE)
November 8-10, 2021
https://www.apegs.ca/Portal/Pages/event-details-7/97795

2021 ACEC-SK Awards of Distinction
November 16, 2021
https://www.acec-sk.ca/event/index.html

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