

# PEG

SUMMER 2018

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Tibetan  
Refugee  
to APEGA  
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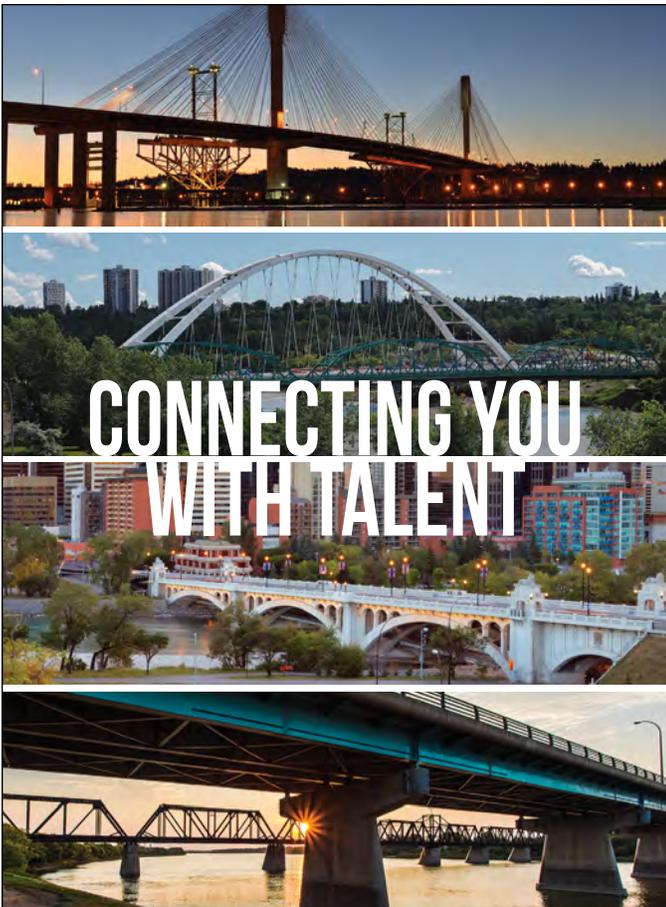
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## SUMMER 2018

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# PEG

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*The PEG* is not a technical, peer-reviewed publication. Although we publish items about accomplishments in research, we **do not** publish actual academic or scientific papers and presentations, even in summary form.

*The PEG* does not accept advertising.

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# Annual Report | 2017



TOWARDS A CENTURY OF SERVICE

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# Let's Work Together to Strengthen Our Professional Community

BY **NIMA DORJEE**, P.ENG., FEC, FGC (HON.)  
*APEGA President*

Being your President puts me front and centre of APEGA, and that's particularly obvious in this edition of *The PEG*. Some of you might even say there's too much Nima going on! Regardless, I am comfortable with the platform you've given me, and I truly believe I have worthwhile contributions to make. It is an honour to be the 99th President of Western Canada's largest self-regulating organization, and I intend to live up to that honour to the best of my ability.

As we close in on the end of our first century of service, my hope is to help improve the APEGA of today and prepare it for tomorrow. I do have ideas, but that does not mean I have all the answers. This job is about putting time and passion into leading, listening, and collaborating, and those are the tools I bring to the table.

We North Americans give individualism a lot of credence. In fact, the whole concept of self-regulation relies heavily on the ability of the self to succeed while doing the right thing for the public's well-being. Smart and ethical APEGA members having reached the top is evident every year at our Summit Awards gala. The *Movers & Shakers* section of this magazine provides further examples. It is not just financial success that I'm talking about, of course, and life is always about more than the money we make. Inevitably, those members who do accumulate many millions of dollars give many millions back in support of the greater good, through charities, scholarships, educational institutions, and more.

Even the most successful among us do not do it alone, however. No person is an island, and that fact of life underpins my presidency. We are on this self-regulatory journey together—you, me, permit holders, Council, the staff of APEGA—and we are on this

journey to serve the public interest. That's our common denominator. Just reminding ourselves of these truths, every day, puts the duty of care conferred upon us into perspective. Every decision, every stamp, every volunteer assignment, every professional development hour should reflect our personal commitment to ethical, skilled, and competent practice.

Many years ago, I joined a Canadian culture filled with stories of immigrants arriving and somehow succeeding. I became one of those stories. I worked hard to get where I am, but I am extremely cognizant of those who helped me along the way.

I was born to Tibetan parents in a refugee settlement in northern India. My father died when I was just three years old and my brother just a year and a half. My mother, who had no formal education, made sure that my brother and I had the opportunity to become the professional engineers we are today.

I am indebted to others, too, especially my wife, Dr. Tsering Dorjee, for giving me the support and time I've needed to pursue my passions. Be assured that one of those passions is this presidency. It's a natural progression for me, personally and professionally, and I'm fully committed to it.

Much of the non-APEGA work I've done recently links directly to my family's homeland. I have worked for the Dalai Lama and, as executive director and president of the Project Tibet Society, I have helped resettle about 1,000 Tibetan refugees from northern India to Canada.

Tibetans, relocated and otherwise, make up one of my communities. Alberta's engineers and geoscientists make up another. The way I look at it, this job is about helping build relationships and support networks



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**“ This job is about putting time and passion into leading, listening, and collaborating, and those are the tools I bring to the table. ”**

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within a group of talented Alberta engineers and geoscientists. It is about listening to and respecting you, so together we can tackle the challenges we face now and prepare ourselves for those that lie ahead. It is about governance and maintaining the ongoing relevance of professional self-regulation.

Community building and leadership characterize what I did at the University of Calgary, both as a student and as a leader in the faculty of engineering. And it's what I've done in my efforts to relocate Tibetans from India to Canada.

So, let's build a more robust APEGA community. Then what? As I said, I don't have all the answers. But of this I am certain: waiting around for the next oil boom is not a reasonable approach to meeting the future. I think there are fundamental changes happening right now in the Alberta and world economies, and we need to address them.

Many jobs in oil and gas are not coming back. Companies, out of necessity, have become leaner and more efficient. It's unfortunate

and it's painful, especially for those of us in the latter parts of our careers, but I don't think the rehiring of professionals in oil and gas will return us to the employment levels we were at before the most recent downturn.

There are alternatives. Sustainable and renewable energy are a real thing in Alberta. There are technological challenges that must be overcome, of course, and that's what APEGA members do: we find solutions. As the province replaces coal as the main contributor to the electrical grid, new jobs are being created. Right now, we are somewhere in the very small double-digit percentage points when it comes to the generation of renewable energy in Alberta. The province has committed us to reach 30 per cent by 2030. That's a growth industry, and it needs us.

A technological revolution continues in the developed and developing world. Manufacturing employment in North America is shrinking because of robotics, artificial intelligence, 3D printing, and globalization. Retail is changing because of a growing online marketplace. Autonomous cars will revolutionize the way we ship goods. The technology for lab-grown meat exists—think for a second what that could mean to the fabric of Alberta.

Professionalism, in these times of change, is just as important as it has always been. Within our membership we have management, leadership, communication, and mentorship skills, all built upon an ethical foundation. I submit that this wisdom is a resource that we can and should share with the world, particularly when we import engineering and geoscience.



## LINKS

[Inaugural Speech](#)

[Project Tibet Society Facebook Page](#)

[Dalai Lama Website](#)

Somewhere within what I've mentioned here is a new approach to so-called outsourcing or off-shoring of engineering and geoscience. When our members authenticate the work of others, perhaps there are steps earlier in the process that we need to make explicit and formalize. Steps that take advantage of the vast well of experience Alberta represents.

It's clear to me that globalization demands that APEGA continue becoming a smarter regulator. Our reason for being, ultimately, is regulation, and given the pace and diversity of technological change, we must always be looking ahead and finding improved regulatory approaches. Just as you must change and adapt in your practice roles, APEGA must change and adapt in its roles.

A year is not a lot of time, and I am not naïve about the impact I can have. There are seeds worth planting, however. With a diverse and capable Council, and you, we can be a positive influence on the strategic direction of APEGA.

Many seeds have been planted by those APEGA Presidents who came before me. I'd like to thank the most recent of those, Past-President Jane Tink, P.Eng., FEC, FGC (Hon.). Her approach of listening to members and permit holders in a direct way is like my own, and I am sure I will seek her wise counsel often as I continue along this path.

I need your counsel, too. You will have opportunities to meet me directly to discuss these and other issues important to you, throughout my term. Please take advantage of them, when you see them promoted on social media, on this website, and in APEGA's electronic newsletter.

And finally, thank you for the trust and confidence you've demonstrated by allowing me to be your President. I will do my very best to be deserving.

## Questions or comments?

[president@apega.ca](mailto:president@apega.ca)

## What My Whiteboard Says About Progress and Renewal

BY **JAY NAGENDRAN**, P.ENG., QEP, BCEE, FEC  
*APEGA Registrar & Chief Executive Officer*

“You know,” a staff member said recently, “these words on your whiteboard are a good roundup of what we’re up to. Expand on some of the topics, and you’ve got yourself a PEG column.”

That sounded like a good idea to me, so here goes. The theme for this edition is *Progress & Renewal*, two complementary concepts that describe what’s happening at APEGA, especially right now. The words align with the restarting of major processes in our operational cycle, such as our nomination process and the typical work involved when getting started with a new Council.

Progress and renewal also relate to much of my role as Registrar & CEO. I’ve been in this position for more than a year now, and the contents of my whiteboard consistently focus on:

- measuring our success
- finding new opportunities to improve
- responding to new information
- aligning our work with Council’s strategic direction
- tweaking our plans
- adjusting course

Thanks to a refreshed and energetic Executive Leadership Team, an enhanced organizational structure, and a strong, positive connection to Council, we are becoming a more nimble, robust, and forward-looking organization. At APEGA, we are always progressing, and we are always renewing.

### THE LEGISLATIVE REVIEW

As APEGA’s second century as a self-regulatory association approaches, we see an APEGA emerging that is better equipped than ever to use the tools of self-regulation to protect the public interest. A thorough and consultative legislative review has landed on 80

Council-endorsed recommendations for changes. These are based on the modern best practices used by self-regulators and the industries our professionals represent.

Begun in 2014, the review used a variety of methods, meetings, and platforms to reach thousands of stakeholders. This was a comprehensive, fact-based consultation and research process. The outcomes and advancements we expect to see from our recommended legislative changes include:

- clarified and explicit authority and responsibility for specific regulatory actions
- improved investigative and practice review tools
- more-appropriate fines
- new and more creative sanctions

### OUR CENTENNIAL APPROACHES

Opportunities like our 2020 centennial don’t come along often (once every 100 years, you could say), so we want to ensure this milestone effectively showcases APEGA’s rich history, vibrant present, and promising future. We want to celebrate what our members have accomplished, and we want to look ahead to the challenges our members and their professions will face in the future.

This is a momentous time in our regulatory success story. The centennial will be an ideal platform for improving the visibility of our professions, and making us all prouder and more aware of our roots.

Helping us in the planning process is an advisory group made up of volunteers and staff. The volunteers represent a good cross-section of the professions, among them two past Presidents of APEGA, representatives of APEGA branches, representatives of academia, and representatives of several engineering and geoscience industries.



## THE THREE PILLARS OF PROFESSIONAL PRACTICE

APEGA's three pillars of professional practice are:

- Individual practice
- Corporate practice
- Practice standards and guidelines

APEGA's tools and guidance in these three pillars will allow you to be successful in meeting your professional obligations as mandated in our *Code of Ethics*. The Professional Practice Department provides you, the licensed professional, access to the resources to demonstrate that you're maintaining your professional competence. Our resources allow you to increase your understanding of the practices required of APEGA professionals and what you are expected to do to "hold paramount the health, safety and welfare of the public and have regard for the environment," as the *Code of Ethics* puts it.

This department was busy in 2017. We have been proactively reviewing both the practices of permit holders and the continuing professional development programs of members. We explained this progress extensively in our *Annual Report*, so please check the link box included with this article for more information.

Additionally, we are revising the following three core standards over the next 18 months:

- *Authenticating Professional Work Products* (which will enter general consultations in September)
- *Relying on the Work of Others and Outsourcing*
- *Professional Practice Management Plan*

Many of the professional practice challenges our members and permit holders discuss with us involve these three standards, so we know this work is extremely important and relevant to you.

## EXAMINING COMPETENCIES

You can read elsewhere in this *PEG* about competency-based assessment (CBA), now being used by applicants seeking professional engineer or engineering licensee designations. This milestone in our registration renewal project, made possible in part by a grant from the Government of Alberta, is an important progress marker for APEGA.

CBA is making APEGA's application process more efficient, consistent, and transparent for those who received their relevant engineering education beyond Canada's borders. CBA engages applicants in the process, in a clear and consistent way, and it allows the Board of Examiners to compare competencies objectively.

## MEMBER EXPERIENCE PROJECT

As part of our membership experience project, we've held focus groups, online sessions, and, in consultation with a reputable research organization, deployed surveys to gather your thoughts and opinions. Our goal is to better understand and improve your online experiences with APEGA.

The two current portals are the Member Self-Service Centre and the Company Self-Service Centre. Many of you use them for a variety of functions, like updating personal information, paying invoices, and submitting documentation. We want to improve and perhaps merge the portals to become a single, outstanding platform—one that's intuitive, innovative, and inviting.

## NEW FACES IN GOVERNANCE

One great example of renewal is our annual Council nomination and election, which took a very brief pause after the spring *PEG* was posted and before our Annual General Meeting & Conference. At the AGM, our 99th President, Nima Dorjee, P.Eng., FEC, FGC (Hon.), was sworn in. I think his ideas and contributions to governance will benefit APEGA's development. You can read about Nima elsewhere in this edition, so I won't go into a lot of detail. His life story is fascinating, and I think his approach and his goals will resonate with many of you.

Working with Mr. Dorjee will be President-Elect George Eynon, P.Geo., FGC, FEC (Hon.), who members voted into the position in the most recent election, along with the rest of the executive and Council.

Our system of annual elections guarantees governance renewal, mentoring, and diversity of ideas. At least four Council seats are filled, each election. Some of them are filled by re-elected Councillors, but many Councillors are brand new to the role. The Council executive includes a President-Elect and the immediate Past-President.

As far as operations are concerned, we're always in elections mode. The call for nominations, you'll notice, is in this edition of *The PEG*. What you don't see, however, is the work behind the scenes to improve your connection to the election process and the role Council plays in self-regulation. The election is an integral contact point with members, and staff are listening to voters and non-voters alike to improve your engagement.

You've told us that you struggle to understand how the composition and role of Council affect you and your professions, and that you don't always connect with the candidates and what they stand for. This, we think, is

reflected in our turnout of 15.1 per cent of eligible professional members. Comparatively speaking, it's not a bad percentage of the vote. Other self-regulators struggle with voter turnout, and elections generally in Canada have seen declining participation. That said, we want to do better and are committed to continual improvement.

## INNOVATION IN EDUCATION AWARDS

A new awards program is on the scene, to motivate teachers and schools to educate students about science, technology, engineering, and math (STEM) in new, effective, and experiential ways. The APEGA Innovation in Education Awards will make available 10 grants of up to \$5,000 each to support K-12 STEM initiatives in Alberta.

Applications close in a few days, so act now if you know of a program that might qualify. A link appears with this column.

## STATUS OF WOMEN GRANT

A link also appears to an article about a three-year, \$350,000 Status of Women grant that APEGA has received to help us address root causes of economic insecurity for women in Canada. We'll be studying workplace barriers for female engineering and geoscience professionals.

## AND THERE'S MORE

We've expanded our mentoring program to branches beyond the cities of Calgary and Edmonton. We're making advancements in business performance, including the early stages of a new quality management system and the standardization of our policies and procedures. We are advancing our IT strategy, learning more about how to effectively collect and utilize analytics, and doing our best to innovate APEGA in creative, meaningful ways.

Just one more note: best wishes from the entire APEGA team for a fun, safe, and enjoyable summer!

### LINKS

[Legislative Review](#)

[APEGA Annual Report 2017](#)

[Experience Assessment System Goes Live](#)

[APEGA Council](#)

[Status of Women Grant](#)

[APEGA Offers STEM Grants](#)

### Questions or comments?

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# Meet the President



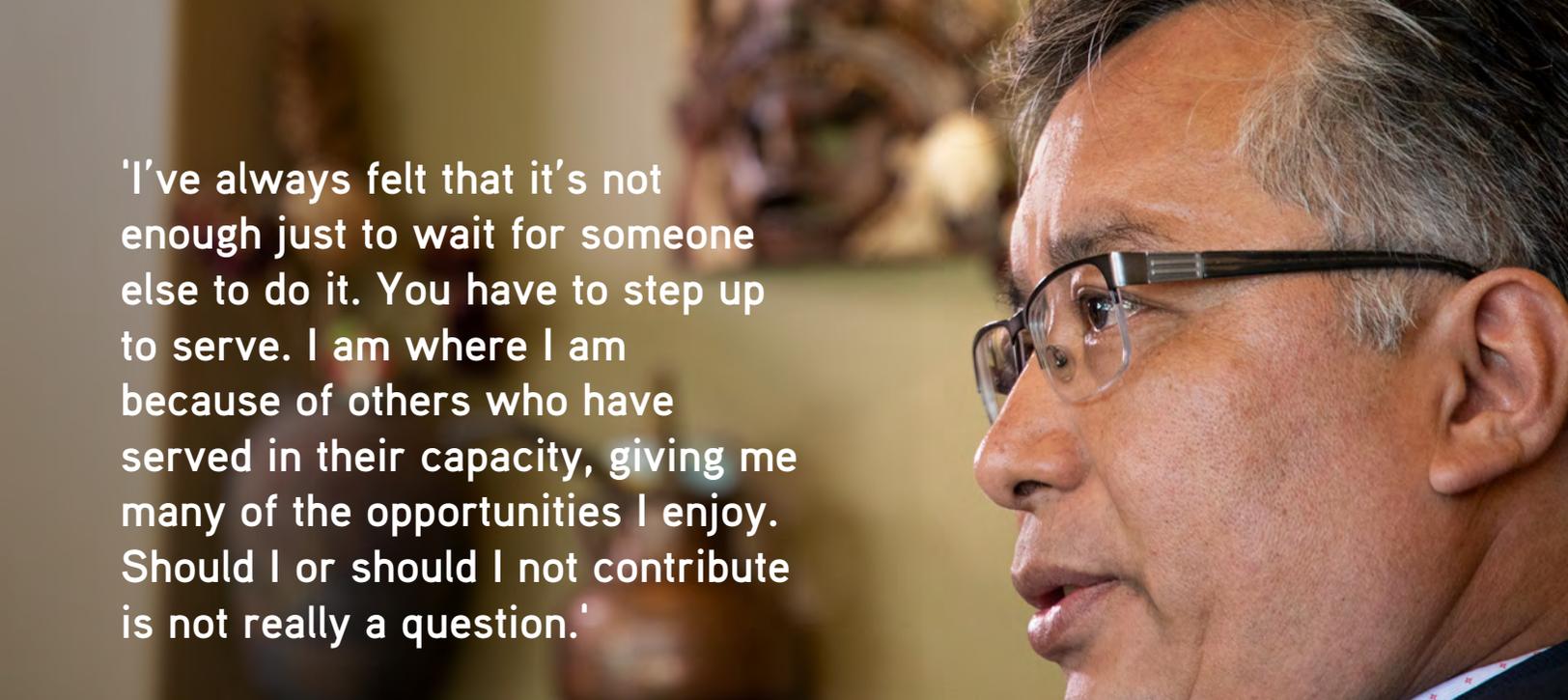
Three major themes important to APEGA's 99th President come through in this Meet the President interview: globalization, community building, and listening.

Nima Dorjee, P.Eng., FEC, FGC (Hon.), says globalization is both an opportunity and a challenge for APEGA. Alberta is well placed to make use of the wisdom and experience it has attracted over the last few decades, he says. The challenge we face is in gaining a better understanding of the extent of outsourcing of professional work to other jurisdictions.

"I'm not saying the work that's happening elsewhere is not up to standard. But we do need to look at and understand the lay of the land in this, because this globalized, high-tech world is changing all the time," he explains.

Community building is a big part of who Mr. Dorjee is. He's a past president of the University of Calgary Students' Union. He later led the engineering intern program at the university. And he recently led the relocation of 1,000 Tibetan refugees, most of them born in India, to new homes in Canada. The project mirrors his own journey—he, too, was born in India in a refugee settlement.

He wants his presidency to be marked by listening to members and learning from them, often in informal gatherings. It's critical, he says, that APEGA understand the landscape of members' careers, industries, professional practices, and lives to inform the governance and services it provides.



'I've always felt that it's not enough just to wait for someone else to do it. You have to step up to serve. I am where I am because of others who have served in their capacity, giving me many of the opportunities I enjoy. Should I or should I not contribute is not really a question.'

"I think we can help develop a strong community of professionals, a community that helps each other, a community that is caring, a community that takes the time to listen to each other," he says.

*Edited and condensed for publication, the following is based on a recent conversation with the President in his Calgary home.*

**Why did you run for President, and why do you think it's important to serve in this way?**

**Nima Dorjee** I've been involved in APEGA since soon after I graduated from the University of Calgary, so the presidency is an extension of something I've been doing for quite some time. I've always felt that contributing as a volunteer is a good way to take part in our overall duty and mandate to protect the public. But beyond that, it's an opportunity to serve my profession and the profession of geoscience.

I realized some time ago that it's always better to be there and be making a difference, especially when you have the opportunity or the ability to do so. APEGA relies on volunteers, in helping staff deliver services and in ensuring that our regulatory and public protection mandate is met. I've always felt that it's not enough just to wait for someone else to do it. You have to step up to serve. I am where I am because of others who have served in their capacity, giving me many of the opportunities I enjoy. Should I or should I not contribute is not really a question.

I let my name stand for President because I feel some issues important to the professions need extra emphasis and because big changes continue to affect our professions. Many of these relate to globalization, technology, and how and where engineering and geoscience work occurs.

**Let's talk more about that. A big part of globalization is outsourcing or off-shoring—the use of engineers and geoscientists elsewhere to work on Alberta projects, even though they aren't licensed here. Other than reviewing and authenticating by Alberta professionals, what needs to be done?**

**ND** Well, before we look at solutions, I think we first need to understand how big the problem is. If it turns out that most of the work is happening elsewhere, we will need to re-examine our role in protecting the public. And no matter what, we will need to step up and offer solutions. I am not convinced that local review and authentication—at least in the way they're done now—are enough.

The initial intent of what we now call the *Engineering and Geoscience Professions Act* was to protect Albertans from work done—in this province—by engineers and geoscientists. Over the last 20-odd years, things have changed drastically. People doing the work may not be within the boundaries of Alberta. I suspect that in many cases they aren't even reporting directly to APEGA professionals. I hope in the next year we can at least get into discussions that will allow us to become a smarter regulator in this new world.

I'm not saying the work that's happening elsewhere is not up to standard. But we do need to look at and understand the lay of the land in this, because this globalized, high-tech world is changing all the time. I think we can engage in these discussions and hear from those doing this work, and then examine if we are fulfilling our mandate to the public. For the work that impacts Albertans, we need to ensure consistent and competent oversight in the practice of engineering and geoscience, no matter where that work is done.

### Are there opportunities in globalization?

**ND** Sure there are. I think globalization ties strongly to another one of the issues APEGA needs to look at from a fundamental perspective—the large number of job losses our members have endured over recent years.

It's important to understand the magnitude of what has happened. It's our role, at the very least, to understand the impact of the downturn on individuals in the oil and gas industry and the magnitude of the downturn.

It is not enough to say that every downturn is the same, that the province and our members will bounce back in the same way we have in the past, that it's all about oil markets and prices. I truly believe this downturn is different. Many factors are causing it, outsourcing and offshoring included. Then there are the dynamics within globalization. There's automation and there's machine learning. Another factor is a change in public perception of pipelines, regulators, and experts generally.

These are all coming at us, right now, and some of them we're already coping with. Many of our members cannot go back to the jobs they've left. It's a changed world.

This is not entirely a story of gloom, though. The human resources we have in this province are highly skilled, very talented, and very experienced. Our engineers and geoscientists have been coming up with solutions for the world for decades. It's just that our talent is expensive, and the work is going where it is less so.

What we have in this province, demographically, is a reverse pyramid, with age and experience at the top. We tend to surplus this talent, which is a nice way of

saying put it out to pasture. But where a lot of the work is getting done, it's more of a pyramid, with legions of young, less-experienced people at the bottom—many of them overseas—and fewer experienced people at the top. What's often lacking in a globalized economy, therefore, is the wisdom, the creativity, and the leadership. Those attributes make up much of the knowledge capital we have.

Our members can help solve the problems that the world faces. They need to be aware of where and how work is happening, and they need to equip themselves to seize these opportunities.

So off-shoring and globalization are not all bad news. I believe that we need to at least engage in this conversation and widen our lens so we can see these things for what they are.

### You talk a lot about conversations, often in informal gatherings like the coffee chats you held in June. Why do you think these conversations are important and what you do want them to accomplish?

**ND** I think we can help develop a strong community of professionals, a community that helps each other, a community that is caring, a community that takes the time to listen to each other. So I invited members to come in and have a coffee and a chat with me, while also allowing them the opportunity to meet each other.

We do not seem to have much of a space for this kind of thing anymore. When people lose their jobs, that networking opportunity is left behind. I want to bring people together and facilitate some professional connections. When we get people meeting, wonderful things happen.

I don't think being a regulator and providing services for members are necessarily mutually exclusive. They're all interconnected. We do have a job board for members to find new positions, but we can't make actual placements. That's not what I'm suggesting at all. But if these meetings allow APEGA to better understand what's happening within the broader membership and be a creator of discussion points, we should be able to connect with the resources of governments and others. We can share with Alberta and the world what our members represent. It's a matter of creating opportunities.



**Our centennial is a chance to showcase the enormous contributions our members make every day. It's an acknowledgement and celebration of success. It's spreading awareness of our roles, and maybe it's a way to influence the public conversation. I think there's a duty within our professions to educate people on the public safety and public value aspects of our work.**

duty within our professions to educate people on the public safety and public value aspects of our work.

Engineers and geoscientists tend to quietly go about their work and get things done. You'd be hard pressed to find out who even worked on a particular project. Their legacy, and APEGA's legacy, is public safety. Major failures are not common in Alberta, and that's largely because of the work APEGA does to make sure competent, qualified, and ethical people practise the professions.

I think globalization will remain huge, but I don't profess to know where the next century will take us (*laughing*). I mean, look: who would have imagined, even 10 years ago, where the world is today?

When I graduated from university, the Internet as we know it did not exist. Google didn't exist as a company until 1998. Facebook came along in 2004. Barriers are coming down. We've never been so interconnected as a world community. Solutions to problems on one side of the world do not necessarily reside there.

What we do as APEGA absolutely is connected. Not just to the other provinces and territories of this country, but to the rest of the world as well. So yes, that is something worth celebrating.

**What should APEGA be sharing with Alberta and the world to mark 2020, the association's centennial year?**

**ND** We're uniquely positioned to tell our story, because our successes are out there, in the real world. Albertans can actually see, experience, and touch many of our members' legacies. Every piece of infrastructure we see and use, every public building, the technology we reach out to each other with, the neighbourhoods we live in, the advancement of oil and gas, the advancement of renewable energy—these are testaments to what our members have accomplished and what they will continue to accomplish.

Our centennial is a chance to showcase the enormous contributions our members make every day. It's an acknowledgement and celebration of success. It's spreading awareness of our roles, and maybe it's a way to influence the public conversation. I think there's a

**Let's jump over to who you are and what defines you as a person and leader. To start with, tell readers a bit about your leadership style.**

**ND** In a word, collaborative. As president, it's my job to coordinate and facilitate Council to ensure that we all have a broad understanding of the issues and access to the information we need to make good decisions.

The first time I sat on Council was about 20 years ago. I was one of the younger members. I appreciated the wisdom that the councillors from different backgrounds brought to the discussions.

There's always the risk, though, that we develop tunnel vision and no longer understand what our members are dealing with or what the issues are from their perspective. Even though I spent a lot of time off Council, I've always been in touch to see what's happening within the professions, both at APEGA and in the field.

This time, I'm concerned with the big changes I've seen occurring, and those are the areas I want to provide extra leadership in. What I'm talking about are no longer emerging issues. They've emerged. They're already here.

With some grey hair comes a little more exposure to the world and a better understanding of things. When you talk about wisdom, it's really about the experiences one has along the way, and hopefully this is what helps us make better decisions and develop better leadership.

they'd be equipped for the problems facing the world. Engineering is a noble profession within that framework, and not just for the ones practising it. It really can be perceived as a helping profession.

My work has always been around the engineering and geoscience communities. While not in the technical roles, there are parallels, so I've always valued and used the training that I've received. As an engineer, you look at where the problems are and then you go and seek solutions. I'm always employing root cause analysis, which is an engineer's approach.

My commitment to the Tibetan community is the other side of it for me. My parents fled Tibet. I was born a Tibetan refugee, and yet I was provided with opportunities. That's put a responsibility on me. What would any disadvantaged group achieve if given the opportunity? A lot, and I've seen it happen.

This occurred to me back in the late 1980s, when I was president of the University of Calgary Students' Union. Another young Tibetan, a woman, was the

“ Our members can help solve the problems that the world faces. They need to be aware of where and how work is happening, and they need to equip themselves to seize these opportunities.

So off-shoring and globalization are not all bad news. I believe that we need to at least engage in this conversation and widen our lens so we can see these things for what they are. ”

### The trajectory of your life and career is far from typical. How's that shaped you? How did you get here from there?

**ND** I always tell others how they need to plan, and yet when I look at myself, I've just gone through things. Sure, I have some broad areas where I put my attention and focus, but the specifics are not as planned as you might think. There's a general theme there, around my profession and professionals, so maybe that's just as important as a concrete plan. That you're true to what you believe in.

When I worked for the University of Calgary, leading the engineering internship program, I was preparing students for the most opportunities possible, so that

president of the students' union for University College at University of Toronto. And yet at that time there were maybe only about 20 Tibetan Canadians in our universities. It was a really small community across Canada, too, at fewer than 300 of us.

All of us 20 or so at university were the first generation, ever, within our families to receive a modern education, and two of us were presidents of students' unions. It occurred to me that there's great potential for those in the disadvantaged communities if given the opportunity. That's been an important lesson to me. I've committed myself to go through my life providing opportunity to people so that they can reach their full potential.

'I'm concerned with the big changes I've seen occurring, and those are the areas I want to provide extra leadership in. What I'm talking about are no longer emerging issues. They've emerged. They're already here.'



**You've done something not many people can say they've done: you've worked with the Dalai Lama. What has the work entailed?**

**ND** My involvement with the [Dalai Lama](#) centres on his vision of the 21st century as the century of dialogue. He often says that the 20th century was the century of war, but in this new century we should be talking to each other to resolve conflicts and address issues.

Technology has allowed us to connect more than ever before, so the tools should exist for dialogue. Yet in this new world that has occurred, of increased nationalism and hatred, how do we use technology for the better of all? We seem to have used it, whether by intention or not, more to isolate ourselves and find barriers.

There are three areas of transformation necessary for this dialogue to take hold: people, religions, and nations.

When you talk about compassion and altruism, no faith or person has a monopoly. Everybody has a universal responsibility. Within compassion and altruism, you find values and ethics.

The idea of nationhood in the future does not sit necessarily within the traditional definition. The European Union is a good example. You're looking at a world that's so interconnected, that the idea of having a common currency and military boundaries don't really exist anymore, or at least not to the extent that they used to.

So it's interesting work and I was fortunate enough that the opportunity arose. How could I say no? If Martin Luther King, Jr., or Mahatma Gandhi were alive today, and you had the opportunity to work with them, what would you do? Why wouldn't you see how you could work together and perhaps help create a better world?

The Dalai Lama is approaching 84 years of age. What can we do while he's still alive to ensure that his work continues? What happens when he's no longer around? Not just for the Tibetan people but for the whole world?

As for Tibet and Tibetans, it's about a country that no longer exists, in a sense. Do we not have a duty to ensure that it does not become extinct? That's always been a personal commitment, and it comes from being born within that context.

Human rights have always been important to me. Everyone should be able to live with dignity, and Canada is a great country for that, where such opportunities exist.

When I came to Canada, I did not have a citizenship with any country. It's only after coming here that I've had that. It's a duty then to ensure that you're always participating and that we maintain this as a society where people can flourish and achieve.

**As the president of the Project Tibet Society, you've helped resettle 1,000 Tibetans in Canada. What should your fellow APEGA professionals know about that work?**

**ND** It really has everything to do with what I've said about giving people opportunity and the importance of immigration to who we are as a nation.

Most of the immigrants this project resettled were born in India, and their parents had fled Tibet. They've never been able to achieve citizenship in India, although it must be said that India has been absolutely wonderful in the resources it's provided. I can't think of any other country that's provided for refugees so well.

Any resettlements to Canada I've been involved in, it's always struck me how much these people's lives change in a 24-hour period of air travel from Delhi to Canada. They've gone from being stateless to being on a path to belonging and having opportunity, in a really short time.

It was important to me to make sure that no one relied on welfare within this project. Not because I have any problem with welfare, but it should be there for those who absolutely need it, and that's the society we live in. So for a project like this, you want to do everything you can to make sure the newcomers don't have to rely on welfare.

And we succeeded. Not one of the resettled Tibetans ended up on welfare, which is remarkable, especially when you consider that about a third of them arrived here illiterate. Many of them have never had the opportunity to go to school, but that shouldn't mean that their children do not have the opportunity.

It was also important that we had zero tolerance for fraud or misrepresentation. We ended up stopping 30 some applicants who had already been accepted, because they had misrepresented themselves in certain areas. If we wanted to ensure that those we resettle

I was fortunate enough that the opportunity arose [to work with the Dalai Lama]. How could I say no? If Martin Luther King, Jr., or Mahatma Gandhi were alive today, and you had the opportunity to work with them, what would you do? Why wouldn't you see how you could work together and perhaps help create a better world?



are going to become contributing members of society, we had to start off strong and send a strong message.

The new arrivals also had to be mindful of their role in helping others. After 80 per cent of the initial group arrived, it was their turn to contribute. So we did no more fundraising on the program’s behalf after that. It was up to them.

My training as an engineer was important. I set out a plan that ensured a cost of only \$600 per person for resettlement. Within three months these refugees had achieved basic financial self-reliance. At the end of the day we brought 1,000 displaced Tibetans to Canada, who are already contributing not only to their own community but to the larger community. We’ve ensured that this happened in an incredibly cost-effective way.

I hope now at this point that they will go on to help others. Their role is to become good ambassadors and contribute to this whole mosaic of a country we call Canada.

**Would you say that your experience in this area speaks to the effects of immigration in Alberta? And how about APEGA, which has an incredibly diverse membership when it comes to countries of origin?**

**ND** Immigration makes us stronger. Alberta has attracted talent from around the world. Rather than looking at this as a burden, we should look at it as our strength, as our opportunity. What professionals from around the world bring to us is an understanding of the world community. The rest of the world is always larger than what we are here.

The cultural know-how, the business, the climate related to other places in the world—we have that knowledge here. We have attracted that to this province, and it happens to be a part of APEGA as well. That is what we have to offer.

When our local, provincial, and federal governments talk about economic development, we need to let them know that we have this talent. We just need to make those strong connections. Our multiculturalism is something we have not looked at as a strength, in terms of something we can market, and not just in the business sense but also in solving the problems the world faces. This is what our members do: we come up with solutions.

Canada has traditionally taken a leadership role, worldwide, in many of these issues, and the downturn

should at the very least give us more opportunity in this area.

**Diversity also presents challenges for APEGA, especially when it comes licensing professionals from other countries. How are we doing on that end?**

**ND** One of APEGA’s fundamental roles is to make sure that we license competent professionals who are ethically, academically, and experientially qualified to do the work of engineering and geoscience. We give the public confidence that the work done by these professionals will keep them safe.

From the perspective of those coming into the organization, though, it needs to happen quickly. And we do want to decide on their applications in a timely manner. But we must be uncompromising when it comes to the quality of our assessments and evaluations.

Now, the world has changed, and some of our application and assessment tools and approaches haven’t always worked the way they were intended to work. That’s why a massive registration renewal project is well underway, and it is starting to show results.

We need to communicate clearly to potential members about the state of their applications, and sometimes this is a challenge. The image applicants sometimes have is that we’re causing delays, but historically that’s not always the case. I’m hopeful that the updated and largely web-based tools are reducing delays, and in fact we’re seeing evidence of that.

**The legislative review was a great example of member engagement. What should we do to further engage members in their association?**

**ND** It’s an interesting issue, when you talk about engagement with a regulator. Our reason for existence is the licensing and regulating of professionals. Beyond that, in terms of member engagement, Council and APEGA have a duty to understand what is happening out there, and that’s a big part of engagement: an accurate picture of the landscape. That’s how we end up with collegial, collaborative approaches to addressing our self-regulatory challenges.



It all stems from trust, and trust begins with empathy and understanding, and that's what encourages our members to participate. It really starts with us.

So the coffee meetings we talked about earlier, and perhaps some town hall meetings during my branch visits—these are opportunities to understand and hear firsthand what's happening around the province, in the careers of members, and in the practices of engineering and geoscience.

### What about public engagement?

**ND** I believe we have a role in creating the space to elevate the public's understanding of the issues as they exist. We come up with solutions for our society, and we should be striving all the time to make the public more aware of this.

When we look at large public projects that face public outcry or opposition, it's not so much about the quality of the engineering or geoscience work. It's sometimes that we fail to understand the perception the public holds of these projects. We can perhaps do a better job on both ends of that: understanding the public's perception and creating a public understanding of the role of engineering and geoscience. We should

not be involved in the political end, but in making sure that the real objections are addressed by the facts. If there are well-founded objections, let's address those.

When I was in high school and early university, acid rain was a big issue. We're not talking about it anymore. It's not that acid rain was a false alarm. It's just that engineers took care of it. Engineers came up with solutions. We found ways to mitigate the effects of acid rain and we developed technologies that send fewer chemicals that cause acid rain into the atmosphere.

The same goes for ozone layer depletion and a massive change—the elimination of chlorofluorocarbons from aerosols in the late 1970s. Engineers took care of it, developing aerosols that do not use CFCs.

Yes, we have big challenges ahead in this world. And APEGA members are part of the solution.

### Is there anything else you'd like to say?

**ND** I'd like to reiterate that I do see my year as a chance to connect with members. When you see a coffee chat or other event advertised that involves meeting me, please take the opportunity to attend if you've got the time. I look forward to meeting you and hearing about whatever it is you'd like to bring up.

# The Chance to Serve— Council Nominations Open Soon

**APEGA’s Nominating Committee is looking for members with the right stuff for Council, as the opening date for our nominating period draws near**

This time of year, our most recently elected Councillors are embarking on one of the most fulfilling challenges of their professional lives: service to the public and the practices of engineering and geoscience at the upper-most tier of APEGA governance. Is it something you’re ready for?

If you think so—or you know of another professional member you think should run—read on. The search is underway for qualified candidates to seek seats next year. An APEGA election takes place the first quarter of every year, renewing Council by filling four of 12 seats and the President-Elect and Vice-President positions. The President-Elect then becomes President the following year.

Nominations open on Monday, August 13, at 9 a.m., and continue for more than six weeks, closing on Thursday, September 27, at 4:30 p.m. APEGA accepts nominations electronically. Information is now posted on our website, and we’ll distributed links via social media and our electronic newsletter, once the nomination site itself opens.

[If you’re interested in running](#), you’ll need to prepare a variety of materials for APEGA’s Nominating Committee, explained in detail on the website. The committee will make sure you are qualified and may even recommend you. Recommended candidates meet specific needs identified as important to the current and upcoming Council. These needs change from year to

year, based on the challenges of the day and on the skill sets Council will need to best meet them.

Names of all properly nominated candidates will appear on the 2019 ballot, regardless of whether they received a Nominating Committee recommendation.

*Information on the skills and qualities that would help you succeed on Council appears on the following two pages.*

## KEY DATES & TIMES

### Nominating Begins



### Nominating Closes



### Voting Begins



### Voting Closes



## 2019-2020 Council Needs

APEGA's Council and Nominating Committee have identified the listed needs for the 2019-2020 Council. Potential candidates and voters should be aware of them.

<b>Effective Board Communication</b>	Ability to review materials for comprehension and articulate questions, views, and opinions in a concise, respectful manner. Ability to clearly formulate ideas, thoughts, and important concepts in oral or written form to contribute to or advance board or committee discussions.
<b>Governance Experience</b>	Ability to ensure objectives are realized, resources are well managed, and the interests of stakeholders are protected and reflected in key decisions. APEGA must consider the balance between public interest, social licence to operate, established governance, and the operation of the organization. APEGA Council governs through policies establishing organizational ends and governance processes.
<b>Knowledge about APEGA</b>	Knowledge of the association through involvement and interaction with APEGA (or ASET) that provide insight into the association, the membership, and stakeholders, as well as the association's challenges and successes.
<b>Leadership</b>	Demonstrated confidence and good judgment in directing the efforts of others to achieve desired outcomes, while modeling respect, commitment, integrity and accountability.
<b>Regulatory Understanding</b>	Knowledge of regulations and regulatory organizations, including the purpose of regulation, gained from working with legislation, having experience being a part of a regulator, or working in a heavily regulated industry.
<b>Risk Management</b>	Knowledge of risk management, crisis management, and the basic laws and regulations under which non-profits operate.
<b>Strategic Planning</b>	Understanding of and experience with an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy.
<b>Understanding of Self-Regulation</b>	Familiarity with the oversight of the engineering and geoscience professions in the public interest by representative members of the professions, in accordance with the <i>Engineering and Geoscience Professions Act (EGP Act)</i> .
<b>Visionary</b>	Ability to employ future-focused and big-picture thinking in a creative and strategic way. Ability to see a desirable future state, while considering the impacts of actions and decisions.
<b>Work Experience</b>	Professional experience of at least 10 years.

# What Does it Take to Be a Strong Councillor?

If you're elected, in most cases you'll serve a three-year term. That's a big commitment—one that goes beyond attending four regular meetings a year.

This list looks at the knowledge and characteristics of a good councillor, no matter what the year.

If you tick most of the boxes below, you'd probably be a great councillor. All the boxes? Outstanding!

- You have experience in professional practice
- You understand the principles behind professional regulation
- You're familiar with board management and governance
- You bring a balanced perspective and problem-solving attitude to any discussion
- You have detailed knowledge of important issues or underrepresented groups
- You're a champion of professionalism and of APEGA
- You are willing to commit time to APEGA and your Council duties



## Nomination Requirements

Following are some the requirements for a potential candidate to consider.

- Reach out to 25 professional members in good standing to support your nomination. Let them know they'll be contacted electronically to confirm their support.
- Write an explanation of why you want to run for Council. Make it no longer than 700 words.
- Rate your skills and attributes, as provided and explained on the nomination site.
- Polish your curriculum vitae for posting.
- Gather other supporting documents you would like to submit for the Nominating Committee's review.

# 2018 Summit Award Recipients

The Summit Awards honour and recognize the contributions APEGA Members make to the engineering and geoscience professions and to society. Congratulations to all award recipients!



## **Centennial Leadership Award** **Leah Lawrence, P.Eng., FEC, FGC (Hon.)**

*In recognition of the highest distinction relating to engineering or geoscience as an executive or director of a continuing enterprise.*



## **Environment and Sustainability Award** **Fort McMurray Wildfire Cleanup**

*In recognition of excellence in the preservation of the environment and the practice of sustainable development.*



## **Outstanding Mentor Award** **Brian Thicke, P.Eng.**

*In recognition of exceptional achievement as a mentor.*



## **Community Service Award** **Reza Nasser, CM, AOE, P.Eng.**

*In recognition of an outstanding contribution made to society.*



## **Early Accomplishment Award** **Nashaat Nassar, P.Eng., PhD**

*In recognition of exceptional achievement in the early years of a professional career.*



## **Excellence in Education Award** **Simaan AbouRizk, P.Eng., PhD**

*In recognition of exemplary contributions to teaching and learning.*



## **Research Excellence Award** **Yang Gao, P.Eng., PhD**

*In recognition of innovative research in the professions that improves our economic and social well-being.*



## **Women in Engineering and Geoscience Champion Award** **Lynne Cowe Falls, P.Eng., PhD**

*In recognition of achievement as a champion of women in engineering and geoscience.*

Nominations for our 2019 awards are now open



# APEGA 2018-2019 Executive Committee and Council

## EXECUTIVE COMMITTEE



**President**  
Nima Dorjee, P.Eng.,  
FEC, FGC (Hon.)



**Vice-President**  
Timothy Joseph,  
P.Eng, PhD, FCIM



**Past-President**  
Jane Tink, P.Eng., FEC,  
FGC (Hon.)



**President-Elect**  
George Eynon, P.Geo.,  
FGC, FEC (Hon.)

## COUNCILLORS



Natasha Avila,  
P.Eng.



Jennifer Enns,  
P.Eng.



Darren Hardy, P.Eng.



Brad Hayes, P.Geol.,  
PhD, FGC, FEC (Hon.)



Mary Phillips-Rickey,  
FCA



Tim Hohm, P.Eng.



Walter Kozak, P.Eng.



RaeAnne Leach,  
P.Eng.



Manon Plante,  
P.Eng., MDS, CD1



Georgeann Wilkin,  
RN, LL.B., MBS



Bob Rundle, P.Eng.,  
PMP



Jason Vanderzwaag,  
P.Eng.



Claudia Villeneuve,  
P.Eng., M.Eng.



Emily Zhang, P.Eng.

## PUBLIC MEMBERS OF COUNCIL

# New Experience Assessment Goes Live

**Experience gained outside Canada can be difficult to compare and explain, making it particularly complex and time-consuming. But for potential engineers seeking APEGA licensure, experience assessments just got simpler and fairer**

APEGA has ushered in a new era—one that features a standardized way of measuring engineering experience for applicants seeking professional engineer or engineering licensee designations. Two-and-a-half years in the making, [competency-based assessment \(CBA\) became a reality on May 2](#), helping make APEGA's application process more efficient, consistent, and transparent.

The process for professional registration can be complex, especially for applicants who gained their experience outside Canada. But CBA makes it easier for them to understand how their skills will be recognized and evaluated. Along with providing clear requirements for applicants, CBA also makes APEGA's assessment of experience more defensible and far less subjective.

The model has a sound track record, and many of Canada's engineering regulators are either adopting or considering CBA. It has, in fact, been used successfully by Engineers and Geoscientists British Columbia for more than 10 years. It's also recommended by two major documents offering APEGA guidance on foreign qualifications—the *Pan-Canadian Framework for the Assessment and Recognition of Foreign Qualifications*, and the *Foreign Qualification Recognition Plan for Alberta*.

*Note: CBA is **not** used by individuals applying for either of our Professional Licensee designations, abbreviated P.L. (Eng.) or P.L. (Geo.), or for our Professional Geoscientist designation, abbreviated P.Geo.*

APEGA began developing an Alberta CBA model in 2015, with support from an Innovation Fund grant from the Government of Alberta. It's a major piece of our multi-year registration renewal project. Registration

renewal aims to improve tools and service, allowing us to process increasingly complex applications faster, more accurately, and more efficiently.

## HOW DOES CBA WORK?

CBA asks applicants to explain how they meet 22 key competencies. These competencies are grouped in six categories:

- technical competence
- communication
- project and financial management
- team effectiveness
- professionalism
- social, economic, environmental and sustainability

Applicants are given a list of indicators for each key competency. The indicators are examples of work situations an applicant can use to demonstrate competence. For each key competency, applicants must list at least one actual situation, plus several actions or other details, making it specific to their experience. Finally, applicants must summarize the outcome of each situation, highlighting how their actions contributed to its overall success.

## A CBA EXAMPLE

*Note: The following example is provided as general information only. The use of any version of this example in an application does not guarantee that the applicant will demonstrate competence in this category. The official authority to evaluate and determine competency lies with APEGA's Board of Examiners.*

## SELF-ASSESS YOUR WORK EXPERIENCE BEFORE YOU APPLY

Prospective applicants can assess their work experience prior to applying for an engineering licence with APEGA. By using our online *Competency Self-Assessment Worksheet (CSAW)*, they can compare their scores to APEGA's licensing requirements. This will help them determine whether they need to improve their skills before applying.

CSAW is an optional self-assessment tool and doesn't affect membership applications. It's not an official document and won't be reviewed by APEGA's Board of Examiners.

To complete the self-assessment, you must have already started the application process and received an APEGA ID number. You will see the CSAW option in your Member Self-Service Centre account.

In the technical competence category, applicants are asked to demonstrate their knowledge of regulations, codes, and standards—including safety, and local engineering procedures and practices.

Indicators for this competency are:

- identify and comply with legal and regulatory requirements for project activities
- incorporate knowledge of codes and regulations in design materials
- prepare reports assessing project compliance with codes, standards, and regulations
- recognize the need to design for code compliance and ensure ability to construct, ability to operate, and ability to maintain, once constructed

An applicant with experience as a mechanical engineer might submit the following example:

*I was assigned a project that required us to develop a fall arrest system for our secondary surveillance radar product line, to allow the maintenance crew access to the top portion of the structure. This comprised an access ladder that was requested by the customer and an outsourced fall arrest system.*

This situation would involve several actions, which the applicant might describe like this:

*It was required that a fall arrest system be installed onto a D-rung ladder.*

*I reviewed the Occupational Health and Safety (OHS) Act, Regulation and Code to determine the maximum allowable fall arrest load that was suspended at a maximum height of 100 metres from the ground. This turned out to be a 4,000-newton payload.*

*I had sourced out a fall arrest system and aluminium ladder that met the OHS standards based on the allowable fall arrest load. I then performed finite element analysis on the guide rail and determined the reaction loads the rail applied to the required number of rungs. The reaction load applied to the ladder rung was at the centre. I calculated the maximum bending and shear stresses of the ladder rung and noted that they exceeded the combined allowable stresses that I calculated based on the design guidelines for aluminum construction as indicated in the Canadian Standards Association (CSA) S157 design code.*

*The design solution that I developed, based on engineering principles to overcome the extreme bending and shear stresses on the rung, was to insert a custom solid aluminum bar conforming to the D-rung cross-sectional shape and supported by end caps. This was only required to be done at rungs that supported the fall arrest guide rail.*

The resulting outcome might be:

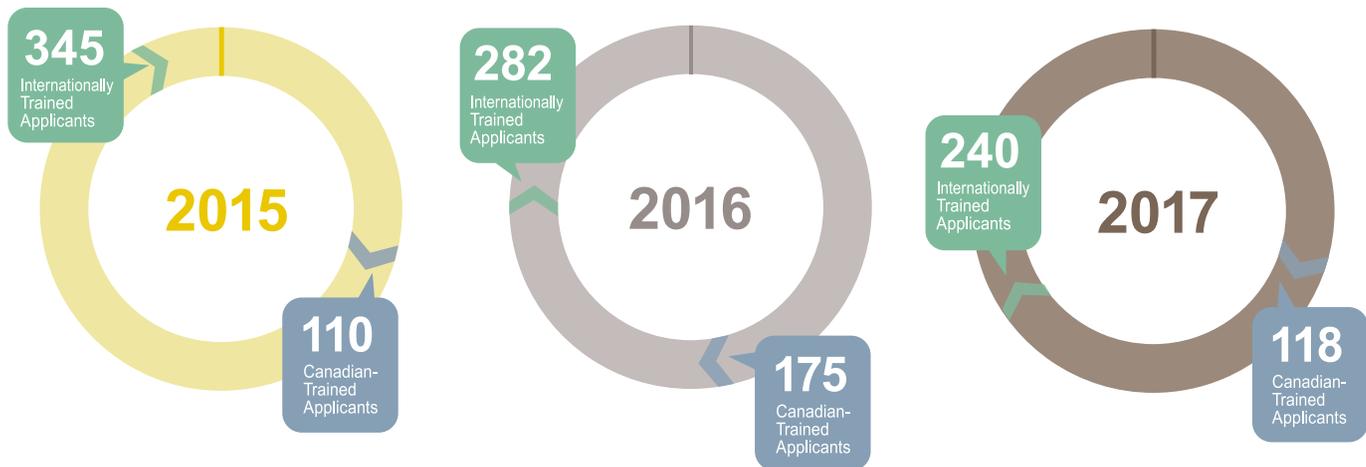
*The design upgrade resulted in making the noted D-rungs a rigid member that would support the excessive bending and shear stress of the loaded rung. A safe and economical design solution was approved and implemented for the customer.*

## THREE LEVELS OF ASSESSMENT

Under CBA, an applicant's proficiency in each of the 22 key competencies will be rated three times.

First, applicants will **self-assess** their competencies. This allows them to think critically about their experience and become partners in the application process.

Each applicant must then identify a validator for each key competency—someone who can **validate or**



*In 2017, APEGA continued to renew, develop, and improve registration tools and processes. Even before we launched competency-based assessment, we were seeing reduced processing times for applications. The most time-consuming and complicated applications are those from internationally trained applicants. Average processing times in this category dropped 18 per cent in 2016 and 15 per cent in 2017.*

**confirm** the assessment by applying direct knowledge of the technical details of the applicant’s work experience.

After that, the application will be **assessed** by two experience examiners at APEGA who are professional engineers. An experience examiner is an APEGA staff member or a volunteer with extensive experience in the applicant’s discipline.

Next, the application will be presented to the APEGA Board of Examiners (BOE) for a decision. Made up of volunteers (most of them professional members but also including public representatives), the board decides whether to register an applicant, or defer or refuse the application.

**WHY CBA?**

CBA is a way to ensure that APEGA’s experience requirements uphold and protect the public interest while providing a fair, transparent, and efficient application process for applicants. It’s a tool for the BOE to use to determine whether candidates meet Alberta qualification standards.

Here’s how it worked before. We asked professional member and engineering licensee applicants to describe at least 48 months of previous work tasks on a document called the *Work Experience Record (WER)*. After an applicant’s references verified the work experience, the BOE determined what level of expertise each task demonstrated.

Back-and-forth with staff often resulted, because applicants needed assistance to document their work experience in a way that the board would understand. This extended processing times.

CBA will help us meet targets for foreign qualification recognition set by the federal Forum of Labour Market Ministers. Federal, provincial, and territorial ministers asked regulators like APEGA to achieve initial foreign qualifications decisions within six months. The previous target was one year, which we were already well within.

**QUESTIONS?**

registration@apega.ca

# Partners in Professional Practice

**APEGA works directly with licensed professionals and permit holders to provide—and improve—the tools you use to practise in a professional manner. This collegial cycle of improvement and development makes you and your association better protectors of the public interest**

APEGA’s Professional Practice Department provides the tools for you, the licensed professional or permit holder, to practise your profession competently and ethically. As part of the responsibility of self-regulation, the department also [reviews the practice of our membership](#) to ensure protection of the public interest.

Within the regulatory spectrum, Professional Practice looks after you once you are licensed. If we do our job well, we are the firewall to keep Investigations, Discipline, and Enforcement from taking an interest in your practice!

Professional Practice is focused on collaborative and collegial engagements—ones in which we learn from each other. We are at your fingertips for

help with practice or ethical issues; you are our eyes and ears to identify practice areas that need clarity, through either a new practice guideline or standard, or refinement of an existing one.

## HOW ARE WE DOING?

### Standards and Guidelines

Informed in part by our practice review process, APEGA continues to develop, revise, and improve professional practice standards and guidelines using a process that involves subject-matter experts and includes member consultation. Professional practice standards and guidelines expand upon the *Engineering and Geoscience Professions Act* to provide details on

## THE REGULATORY SPECTRUM



the expectations, obligations, and responsibilities of our licensed professionals and permit holders.

Over the next three years, APEGA is reviewing and updating three core standards that will assist licensed professionals in meeting their legal and ethical responsibilities. These are:

- *Authenticating Professional Work Products* (see related story)
- *Relying on the Work of Others and Outsourcing*
- *Professional Practice Management Plan*

In 2017, APEGA released two standards. *Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta* is a new, joint standard for APEGA and nine other regulatory bodies. *Evaluation of Oil and Gas Reserves and Resources for Public Disclosure* is an updated standard.

### Practice Reviews

Also in 2017, APEGA piloted a new approach to permit holder practice reviews, with APEGA and permit holders cooperating on the practice reviews. This is benefiting everyone—especially Albertans. The lessons learned from this pilot program paved the way for 26 reviews underway in 2018.

What’s new about our reviews? Well, rather than focusing on the permit holder, APEGA focuses on the practices of engineering and geoscience, using requirements of the Professional Practice Management Plan (PPMP) as our guide. That’s how we identify what areas of practice could benefit from extra attention. Areas of interest we’ve identified include:

- the content of specific practice standards
- the requirements and content of PPMPs
- the types of professional development opportunities we offer

During the process, permit holders gain a better understanding of their professional obligations, and take advantage of an opportunity to give direct and specific feedback to APEGA. And most important, everyone gains through better self-regulation, which serves the public interest.

### Permit Holder Feedback

The improved practice review process has been a positive experience for APEGA and our permit holders. Following is some of the feedback we’ve received from permit holders since starting the new proactive reviews.

- The review was constructive and useful, highlighting areas of practice that could be better and providing a path for improvement.
- The review gave the company the opportunity to reinforce the use of its PPMP.
- The biggest value-added was a better understanding of company strengths and opportunities, regarding structure, communication, and technical assurance and approval processes.

### Practice Learnings for Permit Holders

During our reviews, we learned about common opportunities for improvement, regardless of the size or industry of the permit holder.

- Many permit holders do not have thorough or accurate organizational charts or nominal rolls that clearly outline supervisory and technical lines of control, from members-in-training to the Chief Operating Officer.
- Authentication obligations are not well understood by many licensed professionals.
- Quality management and control systems that support the review of work and authentication are not well documented in PPMPs.
- Project management processes are missing change-request and approval gateways.
- Policies for retention and disposal of professional work products could be stronger.
- Licensed professionals employed by permit holders are lacking in their Continuing Professional Development Program (CPD Program) compliance.

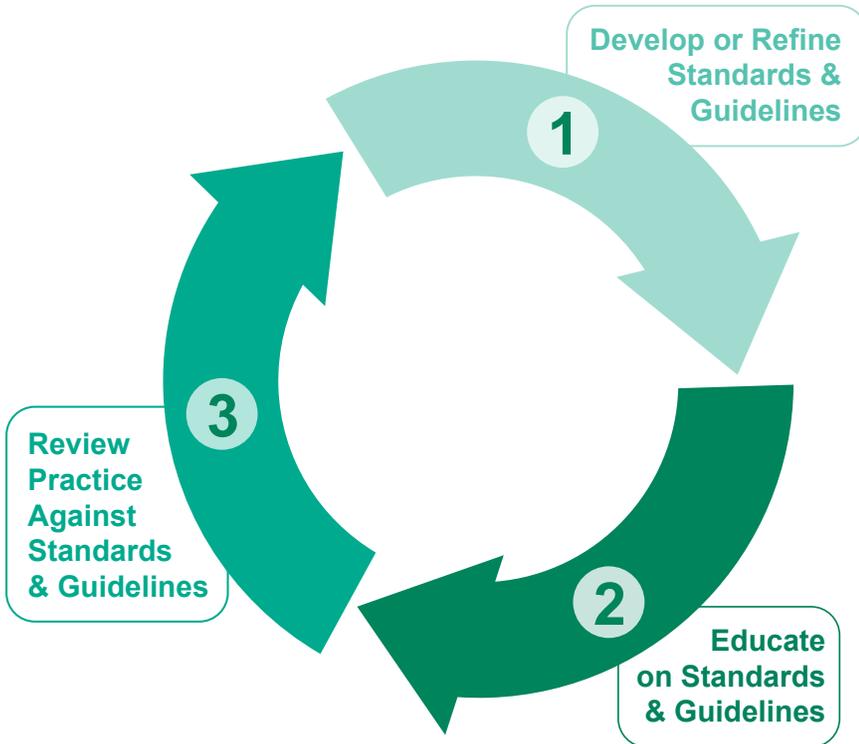
### Continuing Professional Development

In a 2017 pilot project to optimize the administration of the mandatory CPD Program, we reviewed the

detailed CPD submissions of 100 members in three categories:

- members who failed to report any CPD hours in the past three years
- members who had reported CPD but had not met minimum requirements
- members who had met requirements

## PROFESSIONAL PRACTICE CYCLE



Overall, CPD reporting is poor. Many of our members are doing the required amount of CPD, but they don't know how to record it. Over the last two years, we have learned a couple of things that will require effort and energy to change members' CPD reporting habits.

In 2019 Professional Practice will take steps to make it clearer to our licensed professionals:

- what activities are eligible for CPD
- how these activities can be reported

We will also look at modernizing our CPD reporting tools. Reporting is not difficult once you understand the basics of the CPD Program—many more informal activities are eligible than you may realize. *See links below.*

Professional Practice remains committed to your success within the framework of self-regulation, using a continuous cycle of development, education, review, and refinement.

Collegial and collaborative interaction between you and the Professional Practice team is critical to this cycle. Many of our staff are professional members, so we understand the challenges of the workplace. As a result, we are available to help you better understand your professional and ethical obligations. There are many resources available on our website that can help you in your career.

And you can always email us at [ProfessionalPractice@apega.ca](mailto:ProfessionalPractice@apega.ca).

**LINKS**

- [Annual Report 2017: Towards a Century of Service](#)
- [How's Your CPD Doing? The PEG, Fall 2017](#)
- [Continuing Professional Development Program](#)
- [Professional Practice Management Plan](#)
- [Practice Standards and Guidelines](#)

## Consultation Schedule Coming Soon for Authentication Standard

Understanding and properly implementing authentication, particularly in the online, digital space, is one of the most talked-about challenges members and permit holders face in practising the APEGA professions. To improve definitions and add clarity in this important professional role, the Authentication Standard Subject Matter Panel is reviewing APEGA's *Practice Standard for Authenticating Professional Documents*, which was last updated in 2013. [A draft will be ready for general consultation soon](#), and we'll announce in the e-PEG when it's been posted on our website.

An intensive series of consultations across Alberta is planned for September and October, modelled after the ones we used in our legislative review. So far, subject matter experts on the panel have mined their own knowledge and experience, along with that of a select group of permit holders.

Changes addressed in the draft we're finalizing now involve, among other things:

- defining professional work products and allowing professional members to better determine what should be authenticated
- defining a new term—the Responsible Member's validation of professional work product
- standardizing authentication and validation formats to allow professional members, permit holders, and the public to easily identify the authenticator and date of authentication, and the validator and date of validation
- discussing the uses of electronic and digital technology to authenticate professional work products
- setting requirements for authentication of professional work products imported into or exported from Alberta
- providing considerations for the retention and storage of authenticated professional work products



## Learn from the Best in Your Industry!

Gain personalized guidance from an experienced Member.

Hundreds of Professional Members are waiting to meet you through APEGA's online matching software.

Become a **mentee** with APEGA's Mentoring Program.

Sign up at [www.apega.ca/mentoring](http://www.apega.ca/mentoring).



# In Their Words

Every year, the APEGA Annual General Meeting and Conference includes a selection of professional development sessions to engage members in career building, networking, and learning opportunities. We gathered the following comments, edited and condensed for publication, from attendees this year in Edmonton, April 19 and 20.

## Darrah Wolfe, P.Eng. Calgary

*Presenter: Never Reinvent the Wheel Again—Continuous Innovation by Leveraging the Designs of Yesterday*

I absolutely love professional development and I have a love of learning. I was contacted by APEGA to present, so that's one of the reasons I am here, but I am also excited by the topics, especially the focus on innovation and social good. These are things I haven't seen as much of from the technical side of the professions, so I was really interested to come and attend those sessions.

Sara (Haynes, P.Eng.) was great, really quirky and funny. She introduced a model, the social enterprise maturity model, that evaluates the maturity of processes in your organization, as well as the readiness of your business to transform those processes. She did a really good job of introducing the model, which I was not familiar with. I'm looking at doing some work with a startup. As a new organization, it is not fully structured yet, in terms of process, so I think this will be a helpful tool.

The plenary speaker in the morning talked about creativity and innovation, and one thing I took away was the value of looking outside, into multi-disciplinary areas. A lot of organizations I worked with previously really focused on professional development of our technical expertise. But a lot of the conversation here is about how do we gain alignment with business leaders.

**There's the people side—people like to call them the soft skills, but I like to**



**call them the essential skills—so when it comes to searching out PD opportunities, looking into other domains is important. I like to encourage others do to this and I certainly do it myself. It's learning from other industries, learning from other professionals who are experiencing the same challenges but maybe have a different take or perspective on them.**

## Sayed Hussaini, P.Eng. Fort McMurray

I work with the outreach program for APEGA in Fort McMurray, for the branch, so I'm attending to learn about what APEGA does and how to engage with people. I'm learning how to network and how to encourage people to take part in APEGA events. My interest is to work with students, to talk to them, to encourage them to be part of the engineering life, to think in different ways, to be innovative and more creative.

There are a lot of things here to learn about APEGA and its role, things you can take back to your community and explain to the people there. You can represent APEGA and spread awareness of what APEGA does.

**When you do something like engineering, you want to pass it on to others. When there are others coming into your professions, they should start from where you left off. It's the long picture, and it goes beyond the individual.**

The speaker at the plenary session made a good point: that when you innovate things you should always take care of the users. Make sure that the design is meeting what is actually required.

The legislative review session was really informative. It's good that we are in partnership with the Government of Alberta. It's been over 30 years since a major renewal of our legislation, and technology and so many other things have changed. We really need to focus on what APEGA can legislate and regulate.



## Derrick Koenig, P.Eng. Calgary

*Presenter: Mindfulness-Based Safety for Increasing Attention to the Task*

Professional development is important, because engineers and geoscientists must stay on top of current topics. Obviously, we are obligated to fulfill our continuing professional development requirements. But as members of APEGA, it's also important stay on top of emerging technologies and trends. In my case it's business trends I'm interested in. So I learn a lot coming to PD events like this one.

**We need both technical and soft-skill professional development. As engineers, we quite often have really good ideas, and we're very innovative and creative people, but we struggle with the ability to communicate those ideas, which is critical. Otherwise, the ideas never go anywhere. By my definition, a creative idea that is not implemented is not innovative.**

The conference is also great for networking—meeting individuals in different industries and learning about the challenges they're facing.

The session on APEGA's authentication guideline I'm particularly interested in. I know it hasn't been updated in quite a while, and it is probably the guideline that I've used most in my career. So, I'm curious about the discussion.

For the session I'm putting on, I hope people take away the idea of looking at other business models and economic models. That they evaluate whether there's a place for some of those models in our professions and in our industries. The plenary speaker this morning talked about looking outside of our silos, into what others are doing. That fed in well to my topic today.



## Marcia Fortier, P. Geo. Grande Prairie

I feel it's important to be learning all the time. Our professions are continually changing, so continuing professional development is particularly important. I decided this was a good opportunity.

**A lot of times you will be in a business meeting or a work meeting or a conference, and suddenly something you've seen or heard in another conference applies. So I've used what I learn for work situations. It's a good investment, especially when you consider how technology is changing in our industries all the time, how the public is expecting more accountability.**

I'm originally from Saskatchewan. I moved in August. So I found it very interesting to learn about how APEGA is working on updates to our legislation. As a new member here, I found it a good catchup to learn about what my association is doing to represent me and my profession.

The word soft fools a lot of people. The last two years, I took a technical writing course, which is actually considered a soft skill, and I've read a lot of news articles, because our writing is similar. A lot of people are surprised by soft skills. Technical skills a lot of the time are easy, because you already have your education and your mentors giving you examples of what articles to read. But your soft skills of presentation, writing, leadership—sometimes a lot of that is in your APEGA or APEGS conferences. You never know when you are going to get that opportunity to use a soft skill.

I find networking is a really a good source of learning. You never know what you are going to learn from colleagues. A lot of them have faced the need to find tough solutions. And sometimes just talking to them will give you that viewpoint or something else about their experience. Experience is one of the learning tools you get from them.

## Lucy Kaakyo, E.I.T. Edmonton

I really need to keep up with current information. It's important for my profession and for my career. And I was even a host for one room, so it was a volunteer opportunity for me, too.

Originally, I am from Uganda. I came to Canada in the 1990s for training as a chemical engineer, then I went back to Uganda, and then I came back here again in 2009 and worked for a mining company. Now, here I am in Edmonton. I would encourage others who are new to this country to make sure they attend PD conferences like this one. They help bring you up to date with what is happening in Canada. You get to compare it with what you know from your home country, so you are abreast of everything.

**Lots of things were very interesting, especially things to do with innovation and what distracts people from performing well in their workplaces. Some of the things are not so much related to your profession. They are about who we are as human beings, so it's important**



**for us to learn about how the workplace will be affected by personal issues. That was very interesting for me.**

The networking is perfect for me, because I really enjoy being in this kind of a setup. You get to know so many people. You get to understand what they are doing, you get to know what they're challenges are, and you get to compare your challenges to theirs. It's a wonderful time to get to know more people in my profession.

I enjoy expanding my knowledge and understanding of what the fields expect of us and what society expects of us as engineers and professionals.



## Engaging New Speakers and Presenters

APEGA professional development sessions give you practical insights and boost your knowledge. We'll help you meet your competencies, navigate your career path, and find better ways to address workplace challenges.

We are already working on our winter schedule. Stay tuned to our [Events & Professional Development Calendar](#) for session listings.



**Commit yourself to positive learning experiences. Include APEGA in your PD plan.**



## Sharing with Emphasis

Presenters drive home their points during professional development sessions at the APEGA Annual General Meeting and Conference. **1.** Keith Diakiw, P.Geo., presents in the social good theme, *Paying it Forward with Human Interaction Connections*. **2.** Plenary session leader Ben Wienlick tells the audience to consider combining their talents in unusual ways—a process

he calls “muckin’ around, weird creative collusions, and other awkward patterns of innovation.” **3.** Deanna Burgart, P.Eng., presents on including indigenous peoples in science, technology, engineering, and math. **4.** For Alnoor Damji, innovation and leadership have a lot to do with communicating effectively by understanding personality dimensions.

# The Big Night





APEGA celebrates some of the professions' major success stories, each year at the Summit Awards.

**1.** The awards themselves, waiting for their moment in the spotlight, before being taken to their new homes.

**2.** MC Ryan Jespersen gestures to one of the recipients. **3.** Leah Lawrence, P.Eng., FEC, FGC (Hon.), addresses the crowd upon receiving the Centennial Leadership Award. **4.** Dr. Nashaat Nassar, P.Eng., winner of the Early Accomplishment Award, poses at the APEGA photo wall so his colleague can capture an image. **5.** APEGA Registrar & CEO Jay Nagendran, P.Eng., QEP, BCEE, FEC, and the Hon. Christina Gray, the Alberta Minister of Labour and Minister Responsible for Democratic Renewal, listen to a University of Alberta student explain a satellite project—that's satellite as in Earth orbiter. **6.** APEGA's 97th President Dr. Steve Hruday, P.Eng., FEC, FGC (Hon.), FCAE, FSRA, wearing his own past-president's vest, presents a sash to new Past-President Jane Tink, P.Eng., FEC, FGC (Hon.) **7.** Dr. Hruday presents John McDougall, P.Eng., FEC, FGC (Hon.), FCAE, OStJ, with an Order of the Vest for long and outstanding service to APEGA, including—from 1947 to 1960, when he was volunteer registrar—counsel to many APEGA Presidents.

# Movers & Shakers

## ENVIRONMENTAL TECHNOLOGY CHAMPION RECEIVES PREMIER SUMMIT AWARD

Every day, APEGA members apply their brainpower, knowledge, compassion, and professionalism to the myriad of challenges they face. And every year, APEGA honours a selection of these high achievers and their work by presenting them with [Summit Awards](#).

APEGA officially celebrated recipients before a crowd of about 400 members, dignitaries, and others at the 2018 Summit Awards Gala at the Shaw Conference Centre in Edmonton on April 19, capping off the first day of the two-day 2018 APEGA AGM and Annual Conference.

Environmental and sustainability projects, forensic engineering, geomatics, nanotechnology, housing and homelessness solutions, mentoring, teaching, leading—success in these and many other areas are represented in the Summit class of 2018.

Among the recipients is **Leah Lawrence, P.Eng., FEC, FGC (Hon.)**, who decades ago followed her passion into technologies addressing climate change. She served as APEGA President for the 2012-2013 term a few years before heading to Ottawa to join Sustainable Development Technology Canada (SDTC) as President and CEO. In 2017, under



### AMONG THE LOGOS

Leah Lawrence, P.Eng., recipient of the Centennial Leadership Award, poses at an APEGA photo wall at the 2018 APEGA Summit Awards Gala.

Ms. Lawrence's stewardship, SDTC received \$400 million from the federal government, the largest one-time investment in the organization's history. Now, Ms. Lawrence takes her place among APEGA's most distinguished members, having received our Centennial Leadership Award.

## Environment and Sustainability

The Fort McMurray Wildfire Cleanup, which earned the Environment and Sustainability Summit Award, required swift and coordinated remediation. After the May 2016 wildfire ripped through the Regional Municipality of Wood Buffalo, 203,000 tonnes of waste was removed—with more than 70 per cent it being reused or recycled. More than 50 companies directly contributed to the project, which was developed, implemented, and managed by APEGA members **Steve Taylor, P.Geo., Gregory Parker, P.Eng., and Josh Ruud, E.I.T.**

## Research Excellence

A researcher whose studies are making it easier and cheaper to build location technology into electronic devices is the recipient of the Research Excellence Award. **Dr. Yang Gao, P.Eng.**, of the University of Calgary's Schulich School of Engineering, has put a precise point positioning algorithm into service to improve, correct, and simplify satellite navigation for things like smartphones and drones.

## Excellence in Education

**Dr. Simaan AbouRizk, P.Eng.**, is a University of Alberta Distinguished University Professor who's been instrumental in enhancing construction engineering and management education in Alberta. The 2018 recipient of the Excellence in Education Summit Award, he has received recognition around the world for his educational model. Dr. AbouRizk is also renowned as a supervisor and mentor of master's degree and doctoral students in computer simulation for construction planning, productivity improvement, constructability review, and risk analysis.

## Early Accomplishment

Having received his APEGA designation in 2011, **Dr. Nashaat Nassar, P.Eng.**, is just getting started in his engineering and academic career, yet the Early Accomplishment Award recipient has already written more than 100 peer-reviewed publications, given more

than 110 technical presentations, co-edited a book, and filed seven patents. Dr. Nassar is associate professor in chemical and petroleum engineering at the University of Calgary's Schulich School of Engineering.

## Community Service

Since 1996, Landmark Homes has donated more than \$11.5 million to charitable and community initiatives, focusing on post-secondary education, health care, the arts, and programs for newcomers and the homeless. One of the people behind those millions is **Reza Nasser, CM, AOE, P.Eng.**, a co-founder of the construction company that became Landmark and the recipient of the 2018 Community Service Summit Award. Mr. Nasser and his family donated \$10 million in 2014 to the Faculty of Engineering at his alma mater, the University of Alberta, to create and run a space for fostering industrialization and sustainability in the construction industry.

## Outstanding Mentor

**Brian Thicke, P.Eng.**, has helped his mentees "stand a little taller," as one of them has put it, in the world of forensic engineering. Semi-retired now from a career of investigating the causes of fires, explosions, mechanical failures, and other things gone wrong, the Edmonton resident and past employee of Atomic Energy of Canada received our 2018 Outstanding Mentor Award.

## Women in Engineering and Geoscience Champion

Anyone called "Dr. Mum" must have a special relationship with the people around her. So it is with the recipient of the Women in Engineering and Geoscience Champion Award, **Dr. Lynne Cowe Falls, P.Eng.**, a civil engineering professor at the Schulich School of Engineering. Dr. Cowe Falls, who commonly has students queuing outside her door for advice, is noted for her practical and resilient approach to being a professional and a community contributor—which is especially impactful for those of her mentees and students who are women.



## Nominations Now Open

APEGA has been presenting the Summit Awards every year since 1990. For information on nominating a person or project for the 2019 awards, visit [apega.ca](http://apega.ca).



## WHO WILL BE CELEBRATED NEXT?

Shine a light on excellence in engineering or geoscience by nominating a colleague or project for an APEGA Summit Award.



## SUBMIT YOUR NOMINATION TODAY.

[apegasummit.ca/nominate](http://apegasummit.ca/nominate)

Nominations close **September 21, 2018.**



The Association of Professional  
Engineers and Geoscientists of Alberta

## THEY INNOVATE, THEY CREATE, THEY SERVE, THEY GIVE— TWO APEGA MEMBERS RECEIVE ALBERTA’S TOP HONOUR

It is the highest honour the province gives citizens, and the two APEGA members who are about to receive it are nothing short of remarkable.

**David Manz, P.Eng., PhD,** and **Ralph Young, P.Eng.,** are among eight Albertans who will receive the [Alberta Order of Excellence](#) this year. Since 1979, when it was first awarded, only 165 people have been named to the order, which recognizes those who have served Albertans with excellence and distinction.

Dr. Manz has devoted his career to providing one basic need, safe drinking water, to the world’s most vulnerable. He is the inventor of the BioSand Filter, an inexpensive and sustainable water filtering device that provides clean water in developing countries. His filter increases the safety of drinking water, food preparation, hygiene, and sanitation for at-risk communities. Initial testing of the filter in Nicaragua led to the country’s only cholera-free area.

As a cofounder of the Centre for Affordable Water and Sanitation Technology (CAWST), Dr. Manz was instrumental in bringing better water or sanitation to 15.4 million people in 164 countries. In 2011, he won the Alberta Science and Technology Leadership Foundation’s Societal Impact Award for his humanitarian efforts, and in 2017, as *The PEG* reported in our spring 2018 edition, he earned a place on the *Calgary Herald’s* list of the 20 most compelling Calgaryans.

A community and corporate leader, Mr. Young has spent his entire 42-year career with Melcor Developments, rising in the ranks from a young, entry-level employee in 1971 to CEO and president in 2000. Along with raising a family and playing an influential role in the leadership team at Melcor—transforming the business with assets of \$7.4



David Manz, P.Eng., PhD. . .  
. . .better water



Ralph Young, P.Eng. . .  
. . .more education

million to one with revenues of \$220 million and assets of \$1.2 billion—he has remained deeply committed to serving his community.

Mr. Young’s decades-long community service encompasses many areas, but much of it rests on promoting educational opportunities that allow individuals to reach their potential. “I have always had a strong appreciation of the value of education and the role of higher education in society. It is one of the greatest equalizers in any free society,” says Mr. Young in a *YEGpeople* interview. “I believe it’s important to stay involved in ensuring that post-secondary education is accessible and meeting the needs of the students it serves.”

The chancellor of the University of Alberta from 2012 to 2016, he has also served on the boards of MacEwan University and Alberta College (now part of MacEwan). Mr. Young’s accolades include the University of Alberta Alumni Honour Award, the MacEwan University Distinguished Citizen Award, the City of Edmonton Salute to Excellence Award, the Alberta Centennial Medal, and the Queen’s Golden Jubilee Medal.

SPACE  
TRUCKIN'

## SO NICE THEY'RE DOING IT TWICE

A team of University of Alberta engineering and science students has followed up the success of the Ex-Alta 1 satellite, shown here, with funding for a second one. Ex-Alta 2 will supply researchers with information necessary to track, assess, and predict wildfires.

-artist's rendering by Dr. Andy Kale/UAlberta

## SPACE AGENCY GRANT SENDS WILDFIRE PREVENTION INTO ORBIT

Two years after a wildfire devastated Fort McMurray, a group of University of Alberta engineering and science students have secured funding for [an out-of-this-world way to reduce the risk of similar destruction happening again](#).

Supported by the Canadian Space Agency with a \$250,000 grant and a launch date, the AlbertaSat student team will create a miniature satellite. After Ex-Alta 2 starts orbiting Earth in 2020-21, the team will spend the next 12 months using it to monitor wildfire conditions and activity in Alberta. Data collected will enable scientists and emergency services to predict where wildfires might start. Particle tracking will help experts profile active wildfires. The funding, under the Canadian CubeSat Project, will also allow the U of A team to look at wildfire after-effects and recovery rates.

Ex-Alta 2 has an International Space Station connection, too. Cube satellites are caught by the Canadarm, which then deploys them into orbit.

"The data we collect will tell first responders how to allocate firefighting resources so they can better prevent disasters like the one we saw in Fort McMurray," says **Callie Lissinna**, the group's project manager and a student member of APEGA. "Some students on the team have friends and family who were affected by the fire, and it was part of the personal motivation and feeling of communal loss that led to our decision to give back to the community this way," she says in a U of A story.

Ex-Alta 2 is helping space exploration happen at other universities, too, by including open source components—most of them designed by AlbertaSat. Once these components prove themselves, the team will have what's

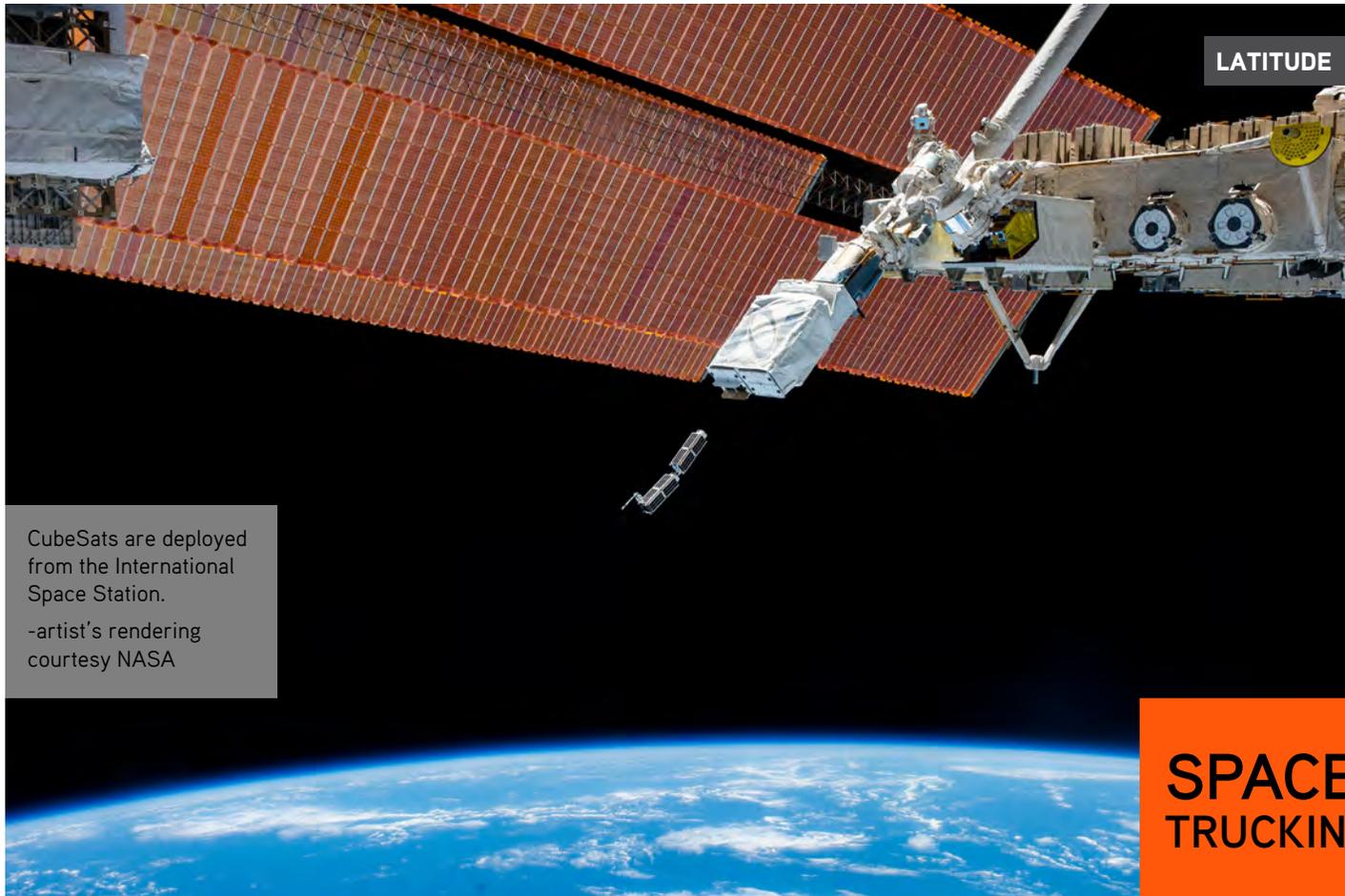
called "flight heritage," increasing its credibility with others who may be considering the components for their own missions.

The Canadian CubeSat Project is designed to increase student interest and expertise in space. Fifteen grants were awarded to Canadian colleges and universities in May. The U of A will be collaborating on a small collection of satellites with Aurora College in Inuvik, N.W.T., and Yukon College in Whitehorse, Yukon. Teams at the schools will work together on satellite design, assembly, and testing, with assembly and testing taking place at the U of A.

"AlbertaSat's involvement in the Canadian CubeSat Project is our next step in growing the aerospace community at the U of A," says Clayton Coutu, communications team lead for Ex-Alta 2. "It ensures that students passionate about space will be able to design, build, and launch spacecraft here for years to come."

This isn't the U of A team's first foray into space. Ex-Alta 2's predecessor—extra points if you guess its name—was launched in April 2017. Part of an international initiative called QB50, Ex-Alta 1 is designed to study space weather. It carries a probe to measure electron density, a radiation monitor, a tool to measure magnetic signatures, and a program for running cube satellites. Ex-Alta 1 is also one of 38 satellites sent into space by universities around the world to study solar wind, which can negatively affect communications and electrical power on Earth.

Ex-Alta 1 caught a ride on a rocket launched from Florida's Cape Canaveral. Grabbed by the Canadarm and deployed from the International Space Station, it's the largest satellite in the QB50 mission. And yes, at the time of this writing, it's still in orbit.



CubeSats are deployed from the International Space Station.

-artist's rendering courtesy NASA

**SPACE  
TRUCKIN'**

## MUST YOU REALLY TO PACK ALL THAT OXYGEN? WE'RE ONLY GOING TO MARS

What's a critical thing to pack when you're embarking on that Mars adventure your species has been dreaming, writing, and scheming about for decades? Better not leave behind your oxygen, that's for sure.

[A group of chemical engineering students at the University of Calgary decided to take a close look at what that would involve](#)—and whether there are options to filling up every nook and cranny in a fleet of rockets with something to breath at your destination.

A solution the students have suggested, as you may have guessed, involves creating oxygen on the planet itself.

The team—including **Laura Fader**, a student member of APEGA—nabbed first place for its work at the U of C's 2018 Engineering Design Fair. The annual event showcases the final offerings of Schulich School of Engineering undergraduates who have spent months envisioning, designing, and modelling their projects. "Our project gave us the opportunity to explore a subject we're passionate about and use our engineering

skills to design an impactful solution for further space exploration," Ms. Fader says in a U of C news story.

Based on its calculations, the team estimated it would take more than 800 tonnes of oxygen to support life on Mars for just a handful of astronauts. Shipping costs would be extraordinary. But what if, instead, the new folks on Mars used atmospheric carbon dioxide that's already there to create oxygen?

The students devised a four-part process that involves electrochemically splitting carbon dioxide into carbon monoxide and oxygen, with the potentially harmful carbon monoxide being transformed into useful byproducts. If the method proves itself futher, it could save \$3 billion in today's dollars in shipping costs.

"When people first hear about this project, they see this as a fantasy project almost. We were able to show that no, this is really a reality," Ms. Fader told the CBC. "Some of our group members are very into space and want to pursue this by all means, so we're excited to see where it goes."

SPACE  
TRUCKIN'

WELCOME TO MARS, UTAH,  
POPULATION FIVE

Zac Trolley, P.Eng., made Utah-as-Mars his home for two weeks in February, all in the name of science.

-photo courtesy Zac Trolley

### 'AND THEN THE AIRLOCK CLOSED'—MARS MEETS EARTH FOR CALGARY ENGINEER

With the desert of Utah behind him, a Calgary engineer continues to keep his sights set on Mars. Initially chosen as a backup for a two-week simulation at the Mars Desert Research Station, **Zac Trolley, P.Eng.**, got his chance when someone dropped out. He made his way to the station, and soon he was [taking care of systems, growing plants, and recycling waste water.](#)

"I hopped on a plane and took the red-eye down to Utah, where we rented a car and drove a few hours down some windy road," Mr. Trolley says in a CBC story. "There was this base out in the middle of the desert. It kind of looked like the Badlands, and we were out all on our own. There was a director there to help us get acquainted, the other crew was there, we got the handover, and then the airlock closed—and we were on Mars."

Any time the crew left the habitat, they donned spacesuits and related gear, including gloves, boots, coveralls, a backpack, and a helmet, just as they would if they were on the Red Planet itself. As for the food, Mr. Trolley says that making it appetizing was, well, a challenge all its own. "We had a big can of Tang and a bunch of freeze-dried foods, so part of the engineering was developing meals that were palatable, every day, day in, day out."

Also on the crew were a professor from an aeronautical university, a mission controller from the International Space Station, and a human factors design associate. Rounding it out was an artist in residence, to help tell the story.

Later stories in the series will include chapters set on Mars, Mr. Trolley believes. "We're going to make it. It's going to be a hard road, it's going to be a difficult road, but from the people I've talked to, from the people I met, from the conversations I'm having now, it's a question of when it's going to happen."



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## E.I.T. EXPLORES MAKING PROTHETICS FEEL REAL

**McNiel Keri, E.I.T.**, was just six when he and his family moved from Egypt to Edmonton, after civil war had forced the family to flee from their home country of Sudan. During high school in his adopted city and country, he joined a homework group for immigrants and refugees.

Two volunteers in the group, an engineer and a physicist, made a lasting impression, inspiring him to choose a profession and a career that would allow him to make a difference in the world. Which is exactly what he's doing.

Now a master's student in mechanical engineering at the University of Alberta's Faculty of Engineering, [Mr. Keri works with his university's Bionic Limbs for Improved Natural Control Lab helping create better prosthetic devices](#). By using sensors connected to nerve endings and muscles, improved prosthetics allow users to touch and sense the world, much like they would with a living limb.

"The goal of my project is kind of twofold. I'm trying to do more exploratory work, trying to find out how we can hack the biology of an individual to try and get them to feel as if their own limb is moving when the prosthesis is moving," he says. "And on the other side, I'm developing technologies that allow us to extract information about how that limb is moving."

Mr. Keri was recently recognized with a National Black Coalition of Canada Award of Excellence in the youth (24 or younger) category for his outstanding societal and community contributions. He's also been named a Top 30 Under 30 by the Alberta Council for Global Cooperation.

Sensors for prosthetics are not new, but they are unaffordable for many people—one limb can set a user back tens of thousands of dollars. Mr. Keri has designed a prototype sensor that offers the same feedback as ones that came before it, but less expensively: it costs just \$100 to create, meaning it opens the door to greater accessibility. And his work isn't limited to limbs. He's also helped create a way for surgeons to view needle insertions in real time, using virtual reality and 2D ultrasound images.

The amputees he works with keep Mr. Keri inspired. "It's amazing, the individuals that volunteer to participate in the studies. They have remarkable stories and their



### FALLING FOR SCIENCE

McNiel Keri, E.I.T., participates in an experiment to learn more about human gait and expand the science of biomechanics. Researchers monitored how he reacted and compensated in different virtual environments—such as standing on a moving bus or boat—designed to put him off balance. The research goal is to aid our aging population by reducing the risk of falling.

energy is just really inspiring," he told the CBC. "I really like the intersection between engineering and medicine and the ability to use my technical skills and medical know-how to improve the quality of life for these individuals. I feel like if you have skills or you have talents, what better way to use them than by trying to improve the lives of others."

## BRING HOME THE HARDWARE, BRING IN THE VIEWERS—A PARALYMPIAN’S REMARKABLE JOURNEY IS PORTRAYED IN A TOYOTA COMMERCIAL

As the commercial opens, a nurse pulls a baby girl from a crib. The baby has no legs below the knee and no left arm below the elbow. The text on the screen reads: “Odds of winning a gold medal?” Answer: not that great. In fact a counter in the frame lists them at one in 997,500,000.

The ad follows the little girl as she grows, first learning to walk, then to ski, and then to race. All the while, the counter shows the odds improving. As the determined young athlete rockets down a slope at the Paralympics, the counter reaches one in 10—and then she crosses the finish line. “When we’re free to move, anything is possible,” the skier says at the end of the commercial.

[The skier is Lauren Woolstencroft, P.Eng., of Calgary, and the Toyota commercial—the first ever by a major car manufacturer not to feature an actual car—is her story of beating incredible odds.](#)

Before retiring from the sport in 2010, Ms. Woolstencroft won 10 medals (eight of them gold) in alpine skiing during three Paralympics Games. She capped her skiing career by becoming the first Canadian to win five golds at a single Winter Paralympics—in giant slalom, slalom, super-G, downhill, and super combined. Her fourth gold medal at those Games set a record for Canada for the most golds at a Winter Paralympics.

It’s estimated that the commercial reached more than 100 million viewers in the United States during the Super Bowl alone. A tech company specializing in video advertising gave it top marks for its emotional, social, and business influence.



-photo courtesy Lauren Woolstencroft, P.Eng.

### EMPHATIC MESSAGE DELIVERY

Retired Paralympian Lauren Woolstencroft, P.Eng., has sent a strong message on the slopes and, through a car manufacturer’s support of Paralympians, in a TV commercial, too.

Her story aired in February before millions of Super Bowl viewers who were watching the Philadelphia Eagles beat the New England Patriots. (Odds of Philly winning the championship, calculated a year earlier: one in 42.) Her journey to becoming one of the world’s leading alpine skiers resulted in a flood of support, even rivaling her Paralympics success. “The amount of messages I’ve had from around the world, and people reaching out who have kids with disabilities, saying it inspired them—it’s incredible,” she says in a Canadian Press story. The ad also ran during coverage of the 2018 Winter Olympics and Paralympics, in Pyeongchang.

“I think the intent was to kind of show my spirit, which was, especially as a youngster, a kind of determined, sort of stubborn young girl determined to do anything and everything,” says Ms. Woolstencroft in a CTV News story.

“Anytime there is a Paralympian that is in some kind of spotlight is amazing,” says Ms. Woolstencroft. “And I think just watching these Olympics in Pyeongchang, there were numerous ads, not just mine, that featured Paralympians, so I think that speaks to the fact there’s interest, there’s great stories, and yeah, I hope it translates into more viewers of the Paralympic Games, and more people getting involved in Paralympic sports. I think that’s the most important thing. That’s the goal.”

## APEGA MEMBER EARNS NATIONAL RECOGNITION FOR SUPPORTING WOMEN IN ENGINEERING



Jeannette Montufar, P.Eng. . .  
 . . .supporting women award

-photo by Rollan Temperosa

Sean Smillie, P.Eng. . . .  
 . . . \$7,500 scholarship

-photo courtesy Sean Smillie, P.Eng.

Once a year, Engineers Canada presents awards to deserving individuals for their engineering excellence and outstanding contributions to their profession, their community, and the safety and well-being of Canadians. [This year's recipients](#) include APEGA member **Jeannette Montufar, P.Eng.**, who takes home the Award for the Support of Women in the Engineering Profession. This award recognizes professional engineers who have provided support for and acted as a role model to women in the field while achieving engineering excellence, serving the community, and participating in associations.

Five other professional engineers, one student, and one project also received Engineers Canada awards:

- Levente Diosady (P.Eng.-ON)—Gold Medal
- Max Mantha (P.Eng.-ON)—Young Engineer Achievement
- Rosa Galvez (ing.-QC)—Meritorious Service Award for Professional Service
- Gary Schubak (P.Eng.-BC)—Meritorious Service Award for Community Service
- Hanan Anis (P.Eng.-ON)—Medal for Distinction in Engineering Education
- Iqaluit International Airport Improvement Project—National Award for an Engineering Project or Achievement
- Vanessa Raponi (McMaster University)—Gold Medal Student

Engineers Canada also handed out six scholarships to recipients under its 2017 scholarship program—three in partnership with TD Insurance and three in partnership with Manulife—to support engineering professionals developing their skills.

APEGA member **Sean Smillie, P.Eng.**, received an Engineers Canada-TD Insurance Scholarship worth \$7,500 to support his study into the energy industry. He uses systems and interdisciplinary methods to increase our understanding of how economics, human behaviour, societal values, and technical engineering interact. Also winning TD scholarships were John Desjarlais (P.Eng.-SK) and Lauren Hutchinson (P.Eng.-BC).

Winning Engineers Canada-Manulife Scholarships, each worth \$12,500, were Nathalie Chevé (ing.-QC), Jennifer Hayward (P.Eng.-NB), and Eva Stephani (ing.-QC).

## CHAIRS ARE THEM—UNIVERSITY OF ALBERTA FACULTY OF ENGINEERING SNAGS CANADA RESEARCH CHAIRS

The University of Alberta's Faculty of Engineering is well represented in the latest round of Canada Research Chairs, claiming eight of U of A's 11 new or renewed appointees. The Canada Research Chairs program aims to cultivate the next generation of research professionals, strengthen Canada's international competitiveness, and improve Canadians' quality of life. By establishing 2,000 research professorships in degree-granting institutions across the nation, the Government of Canada hopes to make Canada one of the world's top R&D countries.

Six of the 11 new university chairholders, listed here with the names of their chairs, are members of APEGA:

- **Christopher Dennison, P.Eng., PhD**, Biomedical Instrumentation
- **Warren Finlay, P.Eng., PhD**, Aerosol Mechanics
- **Clayton Deutsch, P.Eng.**, Uncertainty Management
- **Yang Liu, P.Eng., PhD**, Future Water Services
- **Tongwen Chen, P.Eng., PhD**, Intelligent Monitoring and Control
- **Tony Qiu, P.Eng., PhD**, Cooperative Transportation Systems

## ALL ROADS LEAD TO RED DEER

Some of Alberta's more unique and interesting transportation projects find their way to the [Minister's Awards for Transportation](#), each year. The 2018 awards in Red Deer fall under the leadership of the Hon. Brian Mason, Alberta Minister of Transportation and Government House Leader.

The province uses the awards to celebrate the innovative people and organizations that pave the way to better, more efficient, more sustainable, and safer transportation in Alberta. This year, five of six awards went to projects that directly involved APEGA permit holders:

- 12th Street South East Bridge Replacement. Award of Excellence for Design Innovation. Project team included **City of Calgary** (client), **CH2M Hill**, **Rapid-Span**, and **LaFarge**

- MacLeod Trail and 162nd Avenue South Diverging Diamond Interchange. Award of Excellence for Construction Innovation. Project team comprised **City of Calgary** (client), **ISL Engineering**, and **Graham Construction**
- First Long-Range Battery Power Electric Buses. Award of Excellence for Environmental Innovation. Client was **City of St. Albert**
- Alberta Transportation Wind Advisory System on Highway 22. Excellence for Safety Innovation. Project team included **EPCOR**, **AMEC**, and **IBI Group**
- Downtown Edmonton's Barrier-Free Pedestrian Link project received the Award of Excellence for Transit/Accessible Transportation Innovation. The project team comprised **City of Edmonton** (client), **Graham Construction**, and **DIALOG**.

## REAL-WORLD SIMULATION EARNS BEST-IN-WORLD PRIZE FOR UNIVERSITY OF CALGARY TEAM

A team of University of Calgary students seized an opportunity to show off their engineering and business skills, placing first in a contest designed to simulate real-world challenges. The team—which included **Megan Leslie, E.I.T.**, and **Manpreet Deol**, a student member of APEGA—defeated 13 teams from Canada and beyond, winning the premier prize at the fifth annual [Engineering and Commerce Case Competition \(ENGCOMM\)](#).

Hosted by Concordia University in Montreal, ENGCOMM is a five-day case competition that shines the light on collaborative excellence in engineering and business. “The competition is aimed at bridging engineering and business to innovate viable solutions to address relevant issues in industry,” explains Ms. Deo in a U of C news story.

Teams from Israel, Ireland, Egypt, Holland, and the U.S.—and from fellow Canadian schools like McGill, McMaster, Ryerson, the University of Alberta, the University of Manitoba, and the University of New Brunswick—competed in the round-robin tournament.

Made up of two engineering and two commerce students each, teams tackled topics covering everything from supply-chain management to the introduction of new technology. Students had six hours to assemble a 15-minute presentation for a panel of four judges. For the final round, they were given 12 hours of prep time.

“Not only did we compete, we excelled. We won best engineering solution and best business solution with an overall finish of first place,” says Ms. Deol. “The emphasis on innovation, entrepreneurial thinking, and the bridge between engineering and commerce was exceptional.”



### ALL BUSINESS—AND ENGINEERING

University of Calgary students accept accolades for at ENCOMM. From left: APEGA university student member Manpreet Deol, E.I.T., sponsor representative Kathy Stuart of Paysafe, coach Cameron Welsh of the Haskayne School of Business, Megan Leslie, E.I.T., Nik Golob, Coleton Strand, team ambassador Anton Martynov.

## ALBERTA OIL SANDS-RELATED PROJECTS RECEIVE INJECTION OF CASH

Alberta's oil sands are receiving a hefty investment from the provincial government through [Emissions Reduction Alberta's Oil Sands Innovation Challenge](#). The initiative, to support economic growth and environmental innovation in the sector, is providing more than \$720 million to nine oil sands technologies. The projects could reduce greenhouse gas emissions by as much as 4.1 million tonnes annually by 2030.

Said Shannon Phillips, Minister of Environment and Parks and Minister Responsible for the Climate Change Office: "Albertans know that our economy and our environment go hand-in-hand. These new technologies will reduce emissions while also creating jobs, reducing costs, and boosting competitiveness. Our investments in innovation continue to position Alberta as a forward-looking energy producer and climate change leader."

Forty-seven projects were submitted to the province for grant consideration, including field pilots, commercial demonstrations, and a commercial technology that could potentially reduce greenhouse gases in oil sands operations. Criteria for receiving the grants included the project's ability to advance innovative technology solutions, reduce greenhouse gas emissions, and enhance cost competitiveness. All projects were required to be led by a major oil sands producer and have all field demonstrations occur in Alberta.

Six permit holders are among those leading approved projects:

- **Suncor Energy**—high-temperature membranes for steam-assisted gravity drainage water treatment
- **Canadian Natural Resources Limited**—in-pit extraction process
- **MEG Energy**—enhanced modified vapour extraction pilot, Phase 3
- **Cenovus Energy**—flash steam generation field prototype, a multi-pad pilot of a solvent-aided process, and a partial upgrader with integrated water treatment (in partnership with Heavy Oil Solutions)
- **Imperial**—enhanced bitumen recovery technology pilot
- **ConocoPhillips Canada**—non-condensable gas co-injection for thief zone mitigation

## YES, THEY BUILT THAT WITH WOOD

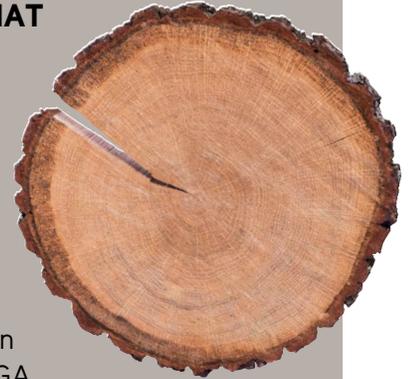
[Wood WORKS! Alberta](#)

celebrated engineers and architects who push the boundaries of wood construction, during the 10th annual Prairie Wood Design Awards gala. Five APEGA permit holders were on teams that were recognized for advancing the use of wood construction through design excellence, advocacy, and innovation.

Top honours, the Institutional Wood Design Award, went to the Technology and Trades Renewal and Innovation Project at Lethbridge College. The project team included **Entuitive Corporation** and **Stuart Olson**.

The Jury's Choice Award went to Calgary's Bow Plaza. **Entuitive Corporation** was involved in that project, too.

Remington YMCA in Calgary and Elevation Place in Canmore both took home the Recreational Wood Design Award. The project teams included **Read Jones Christoffersen, ISL Engineering**, and **Graham Construction**.



## ALBERTA, YOU'VE GOT IT GOIN' ON, CONSULTING AWARDS DEMONSTRATE

The [Consulting Engineers of Alberta \(CEA\)](#) shone a light on the best of the best in a provincial mosaic of high-quality innovation, engineering, and imagination, during its annual gala in Edmonton. CEA judges had shaved a list of 52 submissions down to 26, with 15 recipients receiving Awards of Excellence and 11 receiving Awards of Merit. Awards were presented at CEA's 22nd annual Showcase Awards Gala in February.

*See following pages for the list of award winners.*

## CEA AWARDS OF EXCELLENCE

Project	Firm	Category
The Mayfair on Jasper, Edmonton	<b>Arrow Engineering</b>	Building Engineering—Commercial
Singhmar Centre for Learning, NorQuest College, Edmonton	<b>DIALOG</b>	Building Engineering—Institutional
Rocky Ridge Recreation Facility, Calgary	<b>RJC Engineers</b>	Building Engineering—Recreational
Rocky Ridge Recreation Facility, Calgary	<b>RJC Engineers</b>	Community Development
The Green Line LRT   Setting the Vision, Calgary	<b>Hatch</b>	Community Outreach & In-House Initiatives
Sanitary Grit Treatment and Recovery Facility at Gold Bar Wastewater Treatment Plant, Edmonton	<b>Stantec Consulting</b>	Environmental
City of Calgary Composting Facility	<b>Stantec Consulting</b>	Sustainable Design
Terwillegar Park Footbridge, Edmonton	<b>Stantec Consulting</b>	Transportation Infrastructure—Bridges
Layou River Disaster Management, Dominica	<b>Morrison Hershfield</b>	International
Syncrude East In-Pit Overflow Structure, Wood Buffalo	<b>Amec Foster Wheeler Environment &amp; Infrastructure</b>	Natural Resources, Mining & Industry
Regional Municipality of Wood Buffalo Southwest Water Supply Line	<b>Associated Engineering</b>	Project Management
Northwest Inner-City Drainage Study: Sunnyside Review, Calgary	<b>Associated Engineering</b>	Studies, Software & Special Services
Winter is Coming: Failure Analysis of Edmonton International Airport Heating System	<b>SMA Consulting</b>	Small Firm—Big Impact
Macleod Trail/162 Avenue Diverging Diamond Interchange, Calgary	<b>ISL Engineering and Land Services</b>	Transportation Infrastructure—Roads, Interchanges, Airports, Mass Transit & Ports
Drayton Valley Water Treatment Plant	<b>ISL Engineering and Land Services</b>	Water Resources & Energy Production

## CEA AWARDS OF MERIT

Project	Firm	Category
Schulich School of Engineering Redevelopment & Expansion, Calgary	<b>RJC Engineers</b>	Building Engineering—Institutional
Wheatland Regional Water System	<b>MPE Engineering</b>	Community Development
Amiskwaciy Academy Sweat Lodge Shelter, Edmonton	<b>Stantec</b>	Community Outreach & In-House Initiatives
Sanitary Grit Treatment and Recovery facility at Gold Bar Wastewater Treatment Plant, Edmonton	<b>Stantec</b>	Sustainable Design
Namur Lake Off-Grid Air Monitoring Station	<b>Amec Foster Wheeler</b>	Environmental
Developing Reclamation Success Criteria and Monitoring Protocols for In Situ Oil Sands Reclamation	<b>Golder Associates</b>	Natural Resources, Mining & Industry
Macleod Trail/162 Ave. Diverging Diamond Interchange, Calgary	<b>ISL Engineering and Land Services</b>	Project Management
Strathcona County Snow Melt Facility	<b>Al-Terra Engineering</b>	Small Firm—Big Impact
Failure Analysis of Edmonton International Airport Heating System	<b>SMA Consulting</b>	Studies, Software & Special Services
61 Ave. SW Greenway Corridor, Calgary	<b>Urban Systems</b>	Transportation Infrastructure—Roads, Interchanges, Airports, Mass Transit & Ports
Innovative Concept and Designs to Combine Existing Travers and Little Bow Reservoirs	<b>Amec Foster Wheeler Klohn Crippen Berger MPE Engineering</b>	Water Resources & Energy Production

CEA also recognized **Ken Pilip, P.Eng.**, right, with the 2018 Lieutenant Governor's Award for Distinguished Achievement, and **Jordan Brandenburg, P.Eng.**, far right, with the Harold L. Morrison Rising Young Professional Award.





## The Eloquent Engineer

**By Jun Echevarria, P.Eng., and Bob Serrano**

*From about \$25 through major online retailers*

### **COMPELLING PRESENTATIONS WILL KEEP YOUR AUDIENCE AWAKE—IN A GOOD WAY**

Be honest. Are you guilty of painful presentations that put your audience to sleep, metaphorically or otherwise? Do you resort to jargon over clear, concise messages? Are your slides packed with heavy detail in tiny fonts? Do your Gantt\* charts hurt the eyes and fail to showcase your astute analyses?

“Now, this slide is a little hard to read, but if you look at your handout. . .”

There’s a better place to land, says Jun Echevarria, P.Eng., a Calgary electrical engineer, and he aims to guide you there in his first book, [The Eloquent Engineer](#). Mr. Echevarria collaborated with his long-time friend Bob Serrano, a fellow Calgarian and a creative advisor for a global engineering company.

The two complement each other well. Mr. Echevarria has a master of science degree in electrical engineering and an MBA, as well as professional credentials in project management and business analysis. Mr. Serrano runs his own freelance design and production firm when he’s not working as a creative advisor. Growing up in Manila, they sang together in a choir, then reconnected as adults after they’d moved to Calgary.

Through real-life stories, *The Eloquent Engineer* serves as a great guide for engineers, geoscientists, and technical professionals of any other ilk with a need to translate complex and confusing content into compelling, persuasive, and memorable presentations. The creators want you to better

engage with your audience—clients, colleagues, bosses, boards, neighbours, whomever.

Most of *The Eloquent Engineer’s* anecdotes reflect Mr. Echevarria’s career. Working as an engineering professor and a business executive, he’s learned the importance of simplifying messages so that everyone—professionals and lay people alike—understand what’s being presented.

One of the biggest lessons? Know your audience and craft your message accordingly. If you’re sharing project highlights with engineers, your message should be much different from one aimed at non-engineering managers making budget decisions. “You need to present your proposal in a language that your audience understands,” say the authors. “By using words that are familiar to them, you can better guide their thought process to align with yours—make it easy for them to follow where you’re going and hopefully lead them to the same conclusions.”

The authors continue: “When it comes to making great presentations, it’s all about *them*. In other words, it’s YOU who needs to adjust.”

The book provides simple, straightforward tips and advice on how to make those adjustments. Attractively packed with colourful graphics and photos, it covers both the theoretical and the practical with easy-to-follow examples. Case in point: a chapter that examines how the brain processes words, sounds, and pictures is followed by chapters on how to choose the best imagery and font to convey your message.

Many of the lessons will help you design and choose better visual aids, but PowerPoints are just tools. They should never be the centre of a presentation. It’s the message that matters, say Mr. Echevarria and Mr. Serrano.

The book is an approachable and well-designed resource to help you inform, explain, or persuade. Indeed, almost half of it looks at effective presentation delivery—everything from practising your presentation to avoiding stage fright and making a great first impression.

It is possible to connect with your audience in a way that has them listening, agreeing—and never, ever falling asleep.

## Re-Engineering Canada

By Max Chernetsov, P.Eng., and Brian Dowse, P.Eng.

### A PROPOSAL TO CHANGE THE COURSE OF A NATION

The reasons behind an impasse on the twinning of the Trans Mountain pipeline are many, varied, and conflicting. If you accept the words of pundits and politicians across the country, the impasse is because of the unconstitutional intransigence of B.C.'s premier. Or it's because of a flawed consultation and approval process that fails to hear the voices of all stakeholders. It's because of grave environmental risks to B.C. It's because of unreasonable, misinformed, and out-of-touch protestors. It's because of unreasonable, misinformed, and out-of-touch institutions and business interests.

But wait. There's more. It's because of a need to address climate change and build the market-share of sustainable energy solutions. It's because of a misunderstanding of demand and societal need for oil and its products.

Take your pick.

To Max Chernetsov, P.Eng., and Brian Dowse, P.Eng., much of the above is noise. The pipeline debate, they say in a paper called *Re-Engineering Canada*, is a symptom rather than a cause. The Calgary writers clearly sit in a camp that favours proceeding with the pipeline. But their view is more forward-looking and foundational than calling for the completion of any single project.

File this one under #bigideas. Canada needs to change an archaic structure founded on a "fiefdom mentality," they say. We're crippled by short-term political decisions in a country that needs at least a 50-year view. Our national vision and leadership are failing us, but we can repair ourselves with reform, good planning, a redrawing of the map of Canada, and the creation of two new divisions: the Canadian Capital Territory (CCT) and the Canadian Utilities Corridor (CUC). Wave good-bye to provinces and the existing territories, along with their, well, provincial perspectives. Say hello to six new regions.

The writers see the CUC as "a series of interconnecting land corridors" under the control of the federal government. Reaching tidewater in the east, west, and even the north, the CUC would "allow access and free flow of all products, so that all of Canada could benefit from the abundance that exists." The CCT, meanwhile, would be a territory of perhaps 2,000 square kilometres, spanning the Ottawa River and encompassing Hull and the current Ottawa.

Mr. Chernetsov and Mr. Dowse write that the Government of Canada "should give its citizens a dynamic belated 150th birthday present" by dedicating the country to a project like the one they outline. "The end purpose of these proposed radical changes to Canada would be to eliminate the fiefdom mentality inherited from past European colonial times in North America, reduce the cost of government, increase exports, and more equitably distribute the natural resources of Canada. . ."

The APEGA members with this grand vision are civil engineers and immigrants to Canada. Between them they have practised more than 65 years of in North America, Europe, Africa, Asia, and South America. Most of their experience is Canadian, working on a wide variety of projects from Newfoundland to British Columbia to the Canadian Arctic.

Mr. Chernetsov is president of [SEEDA Inc.](#), a consulting company that positions itself as providing "imaginative planning, engineering, and environmental services." Mr. Dowse is a retired consulting engineer who mentors professionals working on SEEDA projects. It is on the SEEDA site that Re-engineering Canada is posted, but the writing partners would love to see it linked or posted elsewhere.

They concede that the project they propose is massive and challenge-filled. Indeed, it involves the kind of planning, consultation, and rejigging of national interests that suggests a well-worn simile: it's like turning a tanker around in the St. Lawrence Seaway.

That aside, as APEGA nears 2020, our association's centennial year, it also reminds us that our members will likely have plenty of big ideas and grand solutions for the next 100 years of professional engineering and geoscience in Alberta. Or in some unnamed region of the future.



*Editor's Note: After 27 years of contributing to The PEG, writer Gail Helgason has retired. Our World Watch section was the grand finale of her freelance career. Despite our applause and demands for another encore or two, Gail has officially decided to leave the stage. And head to the cottage, no doubt.*

*We miss her already. World Watch tracked everything from wearable electronics to self-driving cars, robot bees to 3D-printed houses, wacky and sustainable skyscrapers to marine electrical generation. The discovery of new minerals to the discovery of old civilizations. The digging of massive tunnels to the building of massive bridges. We've loved every bite-sized morsel of it and so have many PEG readers.*

*Technology, of course, has marched ever onward during Gail's tenure. She was writing for us when apps were made of paper (as was The PEG) and the net was something you took fishing. She stuck in there, though, sharing her enthusiasm for each new scientific twist and turn that came the world's way. Thank you, Gail, for your consistent, dependable, and just plain fun output.*

*Another talented writer toiling behind the scenes for The PEG is Caitlin Crawshaw, our Buzz contributor. The Buzz was—past tense intentional—a feature about issues affecting and reflecting engineering and geoscience in Alberta.*

*Along with Gail, we're bidding farewell to The Buzz and World Watch. Both types of content, however, continue in the recurring section you're reading now, which we've dubbed The Watch. We're adding to the mix content related to the country and other provinces and territories. Caitlin is staying with us, too, and she'll be our prime freelancer on the job.*

*Who knows. Maybe she'll stick around for 27 years.*



—file photo by Keith Diakiw, P.Geo.

## PLANNING AGAINST THE WORST

Strategic city planning could be the key to minimizing damage and destruction from future wildfires, like the infamous one that destroyed this neighbourhood in Fort McMurray in 2016.

## CREATE MORE FIREBREAKS IN CITIES, U OF C RESEARCH SUGGESTS

Engineering researchers at the University of Calgary say urban areas need wide-open spaces to help prevent wildfires from ravaging communities. The team used high spatial resolution satellite images to understand how civic design and planning affected wildfire movement through Fort McMurray in 2016 and Slave Lake in 2011.

The resulting data show that the destruction of buildings was strongly related to how close trees and vegetation were to neighbourhoods. Depending on forest density, even distances of 30 to 50 metres can allow fire to spread.

The study includes recommendations to slow or stop fires, including the use of ring roads and large parking lots as firebreaks.



## DRAMATIC FLAIR CHARACTERIZES THE NEXT CHAPTER FOR EDMONTON'S DOWNTOWN LIBRARY

The project isn't slated for completion until late 2020, but a dramatically reimagined Stanley A. Milner Library is already changing the look of downtown Edmonton. An angular steel skeleton is coming to life, bit by bit—part of a modern take on a building that's been around since Canada's centennial year, 1967.

Observant Edmontonians will notice an appearance that seems to echo, or at least complement, the Art Gallery of Alberta, kitty-corner across Churchill Square. Gone completely will be the so-called Brutalist style of the original building.

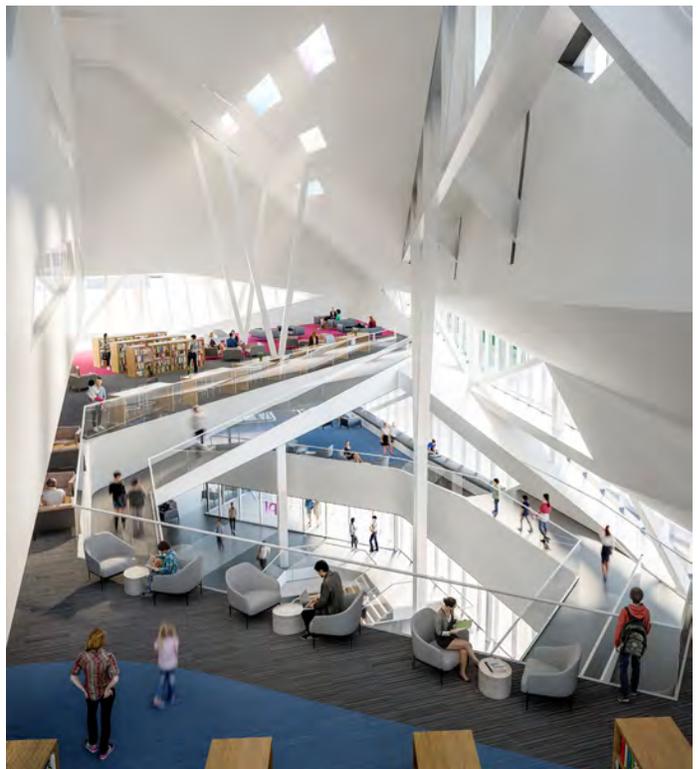
In addition to structural, mechanical, and electrical upgrades, the renovation will include some shiny new technology, like a multi-storey simulation wall and an enhanced makerspace with 3D printing and robotics. Also



worth the wait will

be an additional 6,500 square feet for studying, reading, and meeting fellow humans who have words, research, and creativity on their minds.

Some 3,400 tonnes, or 93 per cent, of old construction material is being diverted rather than landfilled. APEGA permit holder Clark Builders is



### EXCITING NEW LOOK IN THE HEART OF EDMONTON

The experience for library visitors in downtown Edmonton is about to change dramatically.

-artist's renderings courtesy Edmonton Public Libraries

construction manager for the 180,000-square-foot project.

Budgeted at \$84.5 million, the upgrade recently received a \$4-million injection from the federal and provincial governments. Fundraising continues for a remaining \$4.5 million.

## CREE NATION'S OUTDATED WASTEWATER SYSTEM GETS \$32.5 MILLION IN FEDERAL FUNDING

The first wastewater system at Samson Cree Nation was built in the 1970s to serve 2,500 people. About four decades later, the population has swelled to 11,000—but the system has yet to be significantly upgraded. Residents link the aging infrastructure to ongoing sewer backups and health problems.

The community hopes a \$32.5-million investment from the federal government will adequately address their issues. Slated for completion in 2020, the project will upgrade the existing plant to include a new pumping station for wastewater collection and treatment.

Samson is one of four Cree nations served by the Maskwacis community, about 70 kilometres south of Edmonton.



**WAY OF THE WASTEWATER**

A typical wastewater outlet lets its contents free. The Samson Cree Nation's wastewater system is being upgraded with the help of \$32.5 million from the Government of Canada.

## SHUTTERED CALGARY NEIGHBOURHOOD RE-OPENS

Nearly two decades ago, toxic hydrocarbons and lead were found in the soil of Calgary's Lynnview Ridge area, where a refinery had operated between 1926 and 1976. Health risks meant most of Lynnview Ridge was permanently evacuated—more than 200 houses and condos in all.

Now, a city park is the result of \$31 million in remediation of a 32-hectare site. This summer, an old bike path is reopening to the public. The park itself, dotted with balsam poplars and trembling aspens, will open this fall.

The reopened area has been deemed safe for recreational use but not for actual human habitation. The City of Calgary says it will maintain groundwater pumping wells that move subsurface hydrocarbons to a water treatment facility, which will then return clean groundwater to the land.

The refinery's owner, which had bought and demolished homes after the contamination was discovered, is paying for 60 per cent of the work on public lands in and around Lynnview Ridge.



## CONSTRUCTION OF DOWNTOWN HOTEL LAUNCHES CALGARY RISING INITIATIVE

A new \$100-million, 27-storey hotel is coming to downtown Calgary. Slated for completion in 2020, The Dorian will boast 300 rooms, a main-floor restaurant, conference facilities, a fitness centre, and a top-floor restaurant and lounge with an outdoor patio. The hotel will cater to luxury seekers—a market expected to rebound with Alberta's economy—but also to cost-conscious business and tourism customers.

PBA Land and Development says the Dorian is designed to help boost the Calgary economy and is the first project in its Calgary Rising initiative, created to attract private projects.

## ALBERTA BENEFITS FROM \$3.3 BILLION IN FEDERAL INFRASTRUCTURE FUNDING

Through a plan called Investing in Canada, the Government of Canada has committed \$3.3 billion in cost-share funding to Alberta infrastructure projects over the next decade. About \$2 billion of the funding will be used for new urban transit networks and

service extensions in Edmonton and Calgary.

Green infrastructure will receive \$1 billion, community, culture, and recreation infrastructure \$141 million, and projects that improve life in rural and northern communities \$160 million.



### URBAN TRAINS TAKIN' CARE OF BUSINESS

Calgary's CTrain system (above) and Edmonton's LRT are both beneficiaries of recently announced federal funding.

## IN THE ERA OF ONLINE SHOPPING, TWO NEW MALLS ARRIVE ON THE SCENE

More and more people are doing their shopping at their phones and keyboards, so what's with Alberta opening two multi-million-dollar malls, this summer? Maybe it has something to do with knowing your market, and how and where to reach it. The two newbies on the mall scene will offer very different shopping experiences in very different places.

In Edmonton, an outlet mall near the airport is thought to be the first new mall in the region since Mill Woods Town Centre opened in 1988. Premium Outlet Malls Edmonton Airport, which is owned by two companies, Ivanhoé Cambridge and Simon, was built for \$215 million. It features 100 retailers—including anchor stores like H&M and the Nike Factory Store—in an

enclosed, 37,160-square-metre space. The mall also offers travel-related services for shoppers, such as luggage storage and flight update screens.

Meanwhile, in the hamlet of Balzac, just north of Calgary, the New Horizon Mall will open its doors later this summer. A \$200-million project from the Torgan Group and MPI Property Group, the 30,000-square-metre, internationally themed shopping centre is designed to be a lot like an Asian-style bazaar. Most of its 500 occupants will be small businesses, selling diverse specialty items—think incense from Nepal or art from India.

One other interesting note about New Horizon: unlike traditional shopping areas, retail spots will be owned rather than leased.

## CANNABIS INDUSTRY FIRES UP COMMERCIAL REAL ESTATE

As the legalization of cannabis becomes official in Canada, businesses across the country are scrambling to snag commercial real estate for their operations. This is especially true in Alberta, where the race for space is reportedly creating bidding wars and some cannabis businesses are partnering with other types of retailers.

Examples of this include National Access Cannabis Corp., which has signed an agreement with Second Cup to convert some of its coffee shops, and Aurora Cannabis Inc., which recently purchased a stake in the company that owns Wine and Beyond, and Liquor Depot.

Alberta is particularly well positioned to lead Canada's new cannabis industry, and not just because we get a lot of sunny days. Many sellers are setting up shop here because the province has chosen a private model for cannabis retail. Ontario and Quebec are examples of the other approach, which has their provincial governments regulating cannabis sales like they do liquor. Another plus for Alberta, from the retail perspective: Alberta is not capping the number of applications for cannabis retailing licences.

Edmonton-headquartered Aurora Cannabis is one of the country's biggest and fastest-growing marijuana companies. In recent months, the company has invested in not only liquor stores but also an organic waste technology company. It's also been



### THAT CANNABIS-DO ATTITUDE

Thanks to national legalization, clandestine marijuana grow-ops in basements may well be on their way out. Alberta has proven to be particularly fertile ground for booming and sometimes very big cannabis businesses.

buying up cannabis producers, like CanniMed Therapeutics Inc., for \$1.1 billion, and MedReleaf Corp., for \$3.2 billion, the industry's largest takeover so far.

Aurora is scrambling to finish construction of an 800,000-square-foot medical marijuana growing facility near the Edmonton International Airport. Aurora Sky, the company says, will be the largest greenhouse of its kind and will produce 100,000 kilograms of cannabis each year. Aurora Cannabis also operates a 55,000-square-foot facility in Cremona (about 80 kilometres northwest of Calgary) and two others in Quebec. And it's acquired land for an even bigger facility near Medicine Hat—at 1.2 million square feet, Aurora Sun will lead the company's space race, having upped the size by 50 per cent.

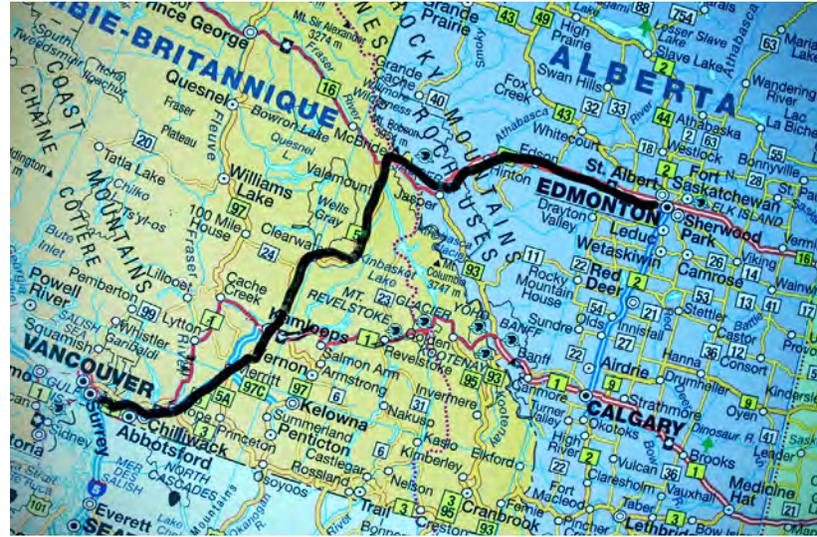
## CANADIAN TAXPAYERS BUY A PIPELINE, BUT TRANS MOUNTAIN PROJECT STILL NOT FINALIZED



Since Kinder Morgan's 2013 application to the National Energy Board, the Trans Mountain Pipeline expansion has faced growing unpopularity, most of it originating beyond the borders of Alberta. Citizens' groups, indigenous and other communities, politics, and at least one election—all of these have seemed to widen divides, despite national, legally binding approval.

In April, Kinder Morgan said it would cut the project loose by May 31 if an impasse between political supporters (the governments of Alberta and Canada) and the Government of B.C. had not been removed.

The lead-up to May 31 was tense. Alberta passed legislation that would allow it to cut off the flow of oil to its next-door neighbour, creating worries about retail spikes at B.C. gas pumps. The Government of B.C. threatened to sue over the turn-off-the-taps legislation, indicating it would apply for an injunction and seek damages if Alberta followed through. Days later, Alberta Premier Rachel Notley stayed away from the Western Premiers' Conference in Yellowknife and, because it didn't include a statement of shared support for Trans Mountain, did not sign a post-meeting communique.



### A CONTENTIOUS LINE ON THE MAP

The Trans Mountain pipeline carries oil 1,150 kilometres from Edmonton to the B.C. coast along this route. Expanding its capacity has proven to be anything but fast and simple.

Just two days before the Kinder Morgan-imposed deadline, the Government of Canada swooped in to save the project, purchasing it and the original pipeline for \$4.5 billion. The intention is to sell it to a private interest.

Premier Notley has indicated that construction will resume this summer, but not everything is settled. B.C. continues to pursue court challenges, and the federal government has not, at the time of this writing, found a buyer for the pipeline.

### LINKS

#### ALBERTA

[Create More Firebreaks in Cities](#)

[Next Chapter Coming Soon for Edmonton's Downtown Library](#)

[Samson Wastewater System Gets Federal Funding](#)

[Shuttered Calgary Neighbourhood Re-Opens](#)

[Downtown Hotel Launches Calgary Rising](#)

[Infrastructure Projects in Alberta Get \\$3.3 Billion in Federal Funding](#)

[New Mall—Edmonton](#)

[New Mall—Calgary](#)

[Cannabis Fires Up Real Estate I](#)

[Cannabis Fires Up Real Estate II](#)

#### CANADA

[Taxpayers Buy a Pipeline](#)

[Smart Grid Project Gets Research Boost](#)

[Aecon Remains Canadian-Owned](#)

[U.S. Announces Tariffs on Canadian Metal](#)

[Fund to Help Communities Withstand Natural Disasters](#)

#### WORLD

[Scientists Seek DNA From Loch Ness](#)

[Printed Autonomous Boats to Maximize River Use](#)

[Different Types of Volcano—Kilauea](#)

[Different Types of Volcano—Volcan de Fuego](#)

[Robots Build a Really, Really Tiny Home](#)

[Unmanned Subs Might Find Shackleton Wreck](#)

## SMART GRID PROJECT GETS RESEARCH BOOST FROM GOVERNMENT OF CANADA

Incorporating clean energy into the electrical grid remains challenging, especially the more intermittent generation that comes from the wind and sun. The smarter the grid, the better it is at managing demand, saving money, and improving reliability and efficiency.

The Government of Canada likes the sound of making grids smarter. It's announced an investment of \$949,000 for a next-generation project aimed at finding ways, including better storage, to integrate clean energy without compromising grid stability and reliability.

Called Power Simulator (SimP), the project is a piece of standardization and experimentation infrastructure for smart grid technologies, says a story in *Canadian Consulting Engineer*. Although SimP is a project of Natural Resources Canada and Hydro-Québec's research institute, the research infrastructure will become open and available to academic and industry interests.



### SMARTENING UP THE GRID

Canada's electrical grid needs an upgrade for dealing with clean energy—that's the premise behind an investment in experimentation and standardization from the Government of Canada. The wires in this photo are in the heart of coal country, near Hanna, Alberta, and the Sheerness Generating Station, about 200 kilometres northeast of Calgary.

## AECON GROUP INC. REMAINS CANADIAN-OWNED—BECAUSE NATIONAL SECURITY

A controversial deal between Canadian construction company Aecon Group Inc. and China's CCCC International Holding Inc. has been quashed by the Government of Canada. Last year, the 140-year-old firm announced its decision to be acquired by the state-run Chinese company for \$1.5 billion, pending government approval.

While the acquisition could have helped pave the way to freer trade with China, analysts warned that it could also put Canada's trading relationship with the U.S. at risk. After its assessment of the deal, the federal government announced that it would block the sale, citing threats to national security.

## U.S. ANNOUNCES JAW-DROPPING TARIFFS ON CANADIAN METAL—BECAUSE NATIONAL SECURITY

Many Canadians were left shaking their heads and rolling their eyes at the U.S. administration's decision to impose—for reasons of national security—a 25 per cent tariff on steel and a 10 per cent tariff on aluminum. Because the U.S. is the biggest buyer of Canadian steel and aluminum, the move will have major impacts on our soil and theirs. A resulting trade war, very likely underway now, would harm all kinds of complexly connected industries.

Calling President Donald Trump's national security rationale "unacceptable," Prime Minister Justin Trudeau hit back by imposing \$16 billion worth of tariffs on a long list of U.S. imports. They'll stay in place until the U.S. lifts its tariffs on Canadian metals. Canada calls the retaliatory measure the biggest trade action we've taken since the Second World War.

President Trump has also imposed new tariffs on metal imports from the European Union and Mexico. Already in place were tariffs against China.

**FUND ANNOUNCED WILL HELP FORTIFY CANADIAN COMMUNITIES AGAINST NATURAL DISASTERS**

The Government of Canada has launched a fund to support large projects meant to help communities withstand natural disasters like floods, wildfires, and droughts. The Disaster Mitigation and Adaptation Fund is a 10-year, \$2-billion national program supporting wetland restorations, setback levees, wildlife barriers, diversion channels, and similar projects. A qualifying project must cost at least \$20 million.



**KEEPING WETLANDS WET AND CITIES LESS WET**

Water doesn't always go where humans want it to go, and that was certainly the case in 2013. This photo shows one of many flooded areas in southern Alberta, the Calgary Stampede grounds.

-file photo courtesy City of Calgary

**SCIENTISTS SEEK DNA SECRETS FROM THE DEPTHS OF LOCH NESS**

If there is a Loch Ness Monster, research this summer might turn up actual evidence, Reuters reports. But since the mythical creature in the famous Scottish lake is widely considered exactly that—a mythical creature—we're not holding our breath.

Scottish scientists are scouring the depths of the lake for any environmental DNA that's down there. Sources will include urine, shells, and feathers. Analysis of the samples will provide information about the types of animal life in the body of water, which is unusually cold and deep.

Enlisted for the mission is a robot dubbed MUNIN. The name, by the way, is especially clunky when it's spelled out—maritime unmanned navigation through intelligence in networks.



**MYTH MEETS MUNIN?**

A deep-diving robot known as MUNIN sheds light on the mysterious, murky waters of Loch Ness, Scotland. The news release spin is that the project might even find evidence of the Loch Ness Monster.



-photo by Reuters, Russel Cheyne

## MULTI-PURPOSE AUTONOMOUS BOATS DESIGNED TO MAXIMIZE RIVER USE

Researchers at the Massachusetts Institute of Technology have designed a fleet of low-cost autonomous boats, mainstream media outlets in the U.S. are reporting. The MIT vehicles, which 3D printers can output at about 60 hours per unit, have the maneuverability and precise control needed to function as self-guided water taxis in cities with abundant waterways. Rectangular hulls come equipped with sensors, microcontrollers, GPS modules, and other hardware.

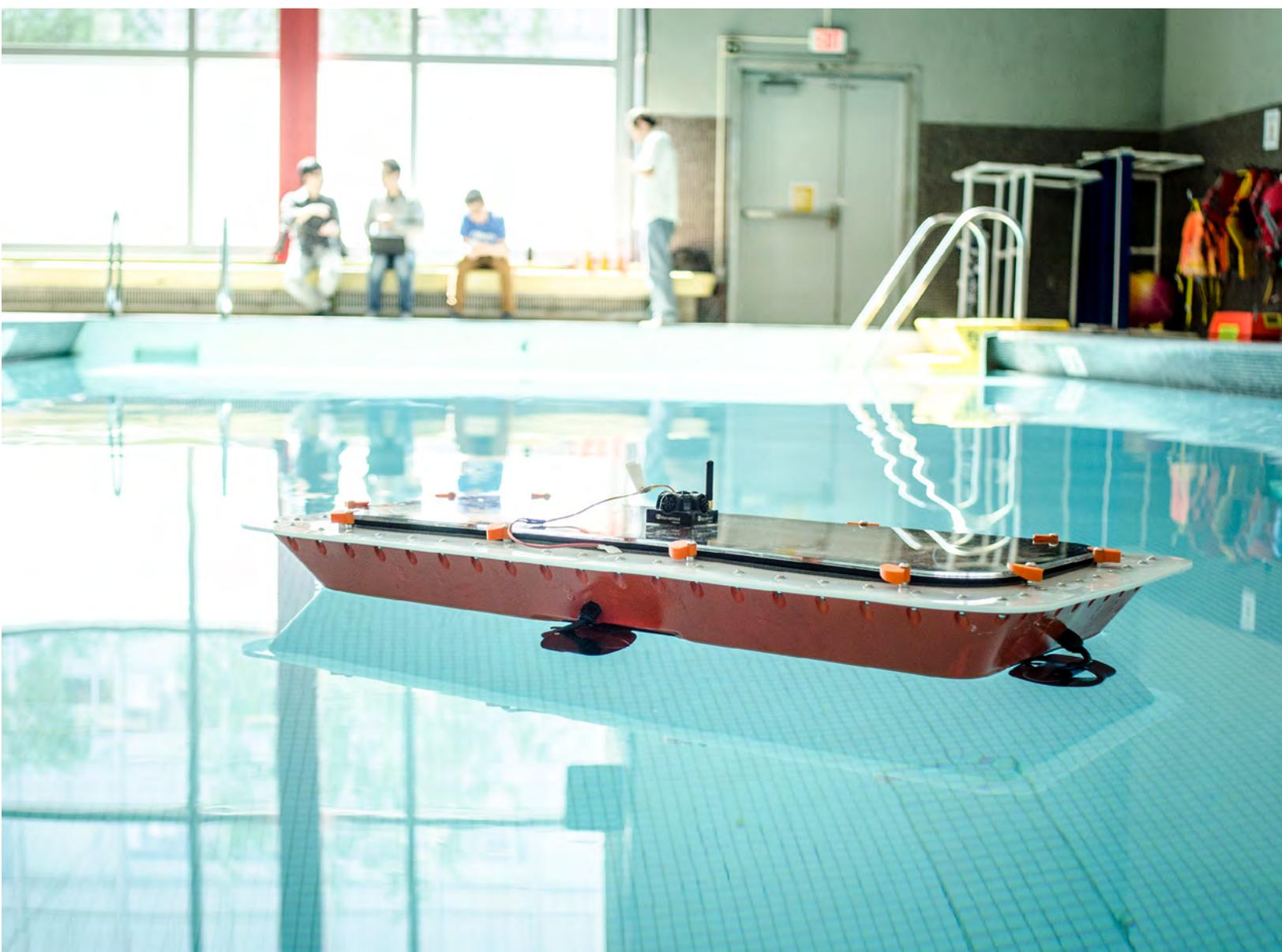
Potential beneficiaries that come to mind are Amsterdam, Venice, and Bangkok. But the pluses could

go beyond keeping tourists and commuters on the move without jamming the streets.

The boats could be programmed to reconfigure themselves into structures like floating bridges or platforms for food markets. They could also monitor a city's water quality and supply.

### A NEW VOYAGE FOR 3D PRINTING

Digital files to 3D-printed autonomous boat—an innovative technology may change the way we travel cities with major waterways. Below, a pool-sized version helps prove the technology.



-photo courtesy MIT researchers

-photo courtesy U.S. Geological Survey



**KILAUEA DOING WHAT KILAUEA DOES**  
The Kilauea Volcano reminds the world that it's still an active volcano, with yet another eruption, May 3.

**DIFFERENT TYPES OF VOLCANO, DIFFERENT PLACES**

Situated on Hawaii's Big Island, the Kilauea Volcano rises 4,190 feet above sea level and makes up about 14 per cent of the land on the island. The volcano has been quietly erupting regularly since 1983.

This spring, it made a particularly big scene when a magnitude-5.0 earthquake hit the island and triggered dramatic eruptions. Locals watched in horror as Kilauea spewed lava into residential subdivisions, destroying homes and forcing 1,700 people to evacuate. Since then, fissures in the volcano have continued to belch out smaller amounts of lava and ash.

Kilauea is no match for Guatemala's Volcan de Fuego, which erupted at night and continues to kill people. Volcan de Fuego is a stratovolcano, prone to spewing fast-moving flows of ash, lava, and mud; Kilauea is a shield volcano, oozing slow-moving globs of lava through its fissures.

Thinner magma within Kilauea means that it can more easily release gases through fissures. Volcan de Fuego's stickier and more viscous magma traps gases, allowing higher—and potentially more destructive and deadly—pressures to build.

All this and more about the two volcanoes can be found on *Live Science*.

**ONE SMALL HOUSE, ONE GIANT STEP**

Although too small for tardigrades, the nano-house is a big achievement for nanotechnologists.

-photo courtesy FEMTO-ST



**ROBOTS BUILD REALLY, REALLY TINY HOME, BUT ADORABLE TARDIGRADES WILL NOT BE MOVING IN**

A robotics team in France has built a nano-house that's about the width of a human hair. With each wall about 0.0006 inches across, it was constructed on the tip of an optical fibre. Each surface of the house was etched onto a sheet of silica crystal, cut with an ion beam, and assembled by tiny robot arms, reports *Live Science*.

While the house would be rejected even by those tiny, cute, six-legged critters called tardigrades (too small, no en suite, one couple allegedly told their real estate agent), scientists aren't worried. The project was not really a housing project. It was a test of a new tool called Micro-Robotex, created at the Femto-ST Institute at Besançon, France. The platform is designed to attach microscopic 3D components to very small surfaces.



## UNMANNED SUBMARINES MIGHT FIND HISTORIC SHIPWRECK

In 1915, the ship of Sir Ernest Shackleton, the famed explorer, sunk to the bottom of the Weddell Sea in the Antarctic. Not a trace of it has been recovered, but that could change soon.

A team of international scientists will set off in 2019, hoping their unrelated work also leads them to the *Endurance*, reports the U.K.'s *Independent* newspaper. Helping them out will be the most advanced unmanned submarines humankind has developed so far.

Led by British scientists at Cambridge University's Scott Polar Research Institute, the team will be the first to use autonomous underwater vehicles equipped with multi-beam echo sounders to scan the seabed. The team's focus is to study the Larsen C Ice Shelf, which recently calved one of the biggest iceberg ever recorded in Antarctica.

### IF YOU HAPPEN TO SEE A SHIPWRECK

Autonomous underwater vehicles will accompany a team of scientists to the Antarctic, where they'll help research a massive calving—and maybe find Shackleton's long-lost ship.

-photo courtesy Ocean Infinity/Weddell Sea Expedition

# 2018 ANNUAL GENERAL MEETING & CONFERENCE

APEGA extends its deepest gratitude to the following organizations for their generous sponsorship of the Annual General Meeting & Conference 2018.

### BENEFACTOR



### SUMMIT AWARDS



### SUPPORTER

- Canadian Natural Resources Limited
- Capital Power
- ENMAX
- EPCOR Utilities Inc.
- Fluor
- General Dynamics Mission Systems-Canada
- Great-West Life
- Ledcor Group of Companies
- NOVA Chemicals

### PROFESSIONAL DEVELOPMENT

- TransCanada

## Science Challenges Meet Their Match



**They came, they saw, they collaborated, they created. And yes, they even conquered. More than 1,400 grades 1 to 12 students took part in [APEGA Science Olympics events](#) over the past school year, enthusiastically tackling the engineering and geoscience challenges put before them**

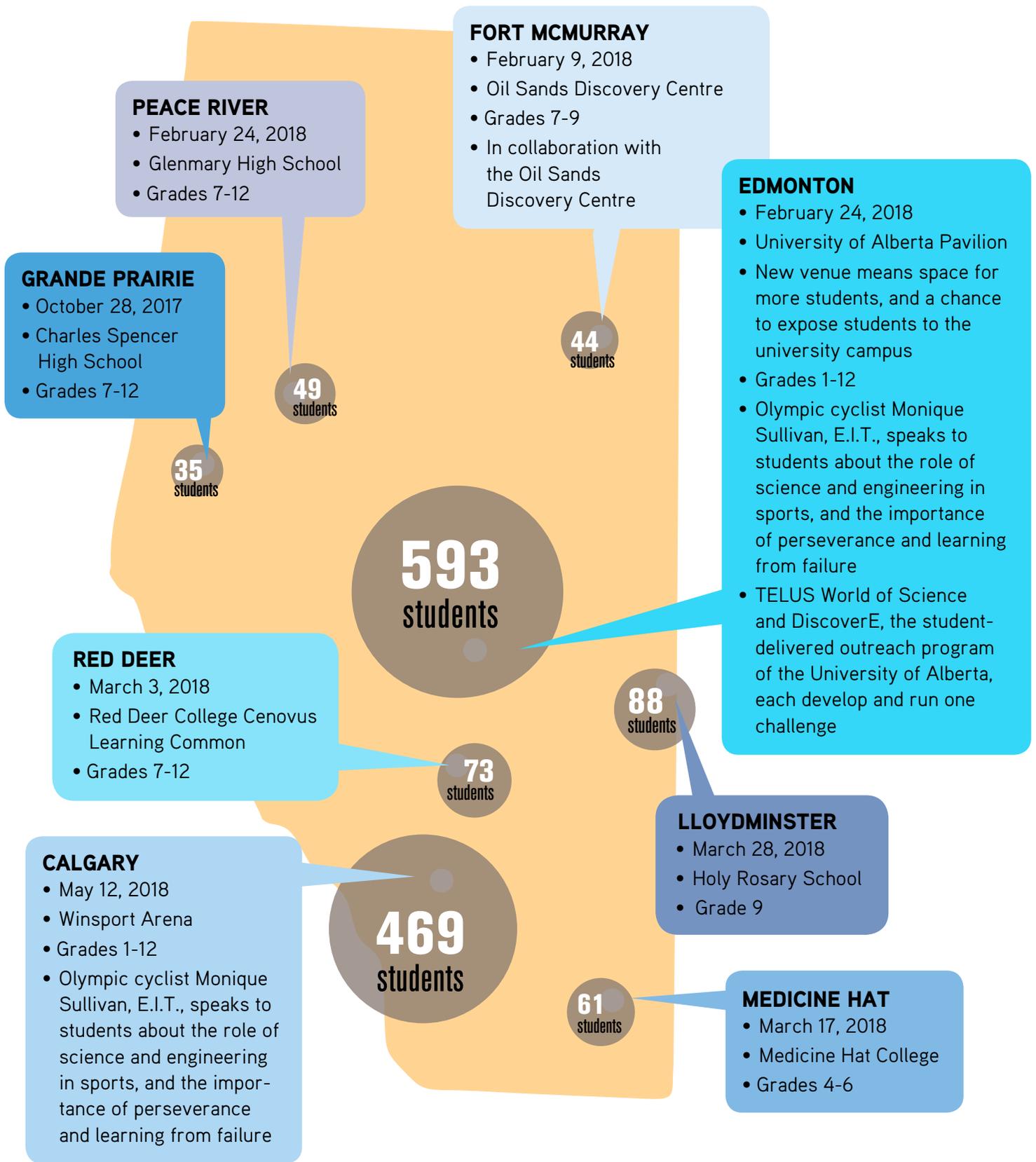
In Edmonton, the Science Superstars and others designed space suits for “eggstronauts,” being careful to protect their “eggcellent” cargo. Calgary high school students came up with creative slope-reinforcement techniques for preventing houses from slipping into a valley during heavy rainfall. And students in both cities were challenged to create a device to help clean up the Great Pacific Garbage Patch—while dealing with a pesky current created by fans.

These are just a few of the dozens of hands-on challenges undertaken by students across the province at APEGA Science Olympics competitions held over the past school year. In addition to Calgary and Edmonton, APEGA Science Olympics were held in Fort McMurray,



Top, Grade 9 students in Lloydminster (Vermilion River Branch) immerse themselves in Runoff Rumble, which challenged them to protect precious sugar cubes from flooding caused by erosion on a slope. Above, students in Edmonton are all suited up in their personal protective equipment for a day of science.

# QUICK FACTS



**PEACE RIVER**

- February 24, 2018
- Glenmary High School
- Grades 7-12

**FORT MCMURRAY**

- February 9, 2018
- Oil Sands Discovery Centre
- Grades 7-9
- In collaboration with the Oil Sands Discovery Centre

**EDMONTON**

- February 24, 2018
- University of Alberta Pavilion
- New venue means space for more students, and a chance to expose students to the university campus
- Grades 1-12
- Olympic cyclist Monique Sullivan, E.I.T., speaks to students about the role of science and engineering in sports, and the importance of perseverance and learning from failure
- TELUS World of Science and DiscoverE, the student-delivered outreach program of the University of Alberta, each develop and run one challenge

**GRANDE PRAIRIE**

- October 28, 2017
- Charles Spencer High School
- Grades 7-12

**RED DEER**

- March 3, 2018
- Red Deer College Cenovus Learning Common
- Grades 7-12

**LLOYDMINSTER**

- March 28, 2018
- Holy Rosary School
- Grade 9

**CALGARY**

- May 12, 2018
- Winsport Arena
- Grades 1-12
- Olympic cyclist Monique Sullivan, E.I.T., speaks to students about the role of science and engineering in sports, and the importance of perseverance and learning from failure

**MEDICINE HAT**

- March 17, 2018
- Medicine Hat College
- Grades 4-6

## SCIENCE OLYMPICS

Grande Prairie, Lloydminster, Medicine Hat, Peace River, and Red Deer.

Outside the two major centres, APEGA branches organized the events. All of the events were supported by professional members and other volunteers, including members-in-training, university students, teachers, and parents. Working with APEGA staff, volunteers develop and test the challenges, judge them on event days, and act as awesome role models.

No matter the grade level, activities were designed to reinforce science concepts students are learning at school. Some were more complex classroom challenges that students worked on ahead of time. Other mystery challenges were revealed and completed at the events.

All challenges have a common goal: to encourage student ingenuity and critical thinking, while highlighting the creative, collaborative, and meaningful work done by engineering and geoscience professionals.



Top, students in Calgary learn about the engineering principles underlying the creation of traditional Blackfoot tipis (niitoy-yiss). Above, volunteer judges in Peace River pose for their group shot.

Top, a team in Edmonton celebrates reaching the gold threshold. Middle, a junior high student in Fort McMurray becomes a Seismic Sleuth, an event which had participants identify a mystery object in a box by mapping its height profile. Bottom, team members in Calgary show off their classroom challenge results: a viewing device to decode a secret message and a description of their invention to help people without all their senses.



**SOCIAL MEDIA BUZZ**

*@David44819436*

The car that made it 6 and a half meters!  
Super lightweight design, great job guys!  
#SciOlympics

*@Saalty\_Buckets*

Science Olympics is fun! All of our great minds combined in the collective. Apart we are weak, together we are strong! #SciOlympics #squad

*@saraabbimaharaj*

Wahoooooo Div 1 "SpyKidz" got SILVER!!!!  
Thank you @APEGA\_AB for hosting such a well organized event today! #SciOlympics @WeAreLouisCBE @Metjill

*@CATCH\_Eng*

Think we're getting a glimpse here at some of Alberta's future scientists, engineers, and innovators - very cool stuff, @APEGA\_AB!

*@DiscoverE\_UofA*

Thank you @APEGA\_AB for having us at the Science Olympics! We love coming back every year! #SciOlympics

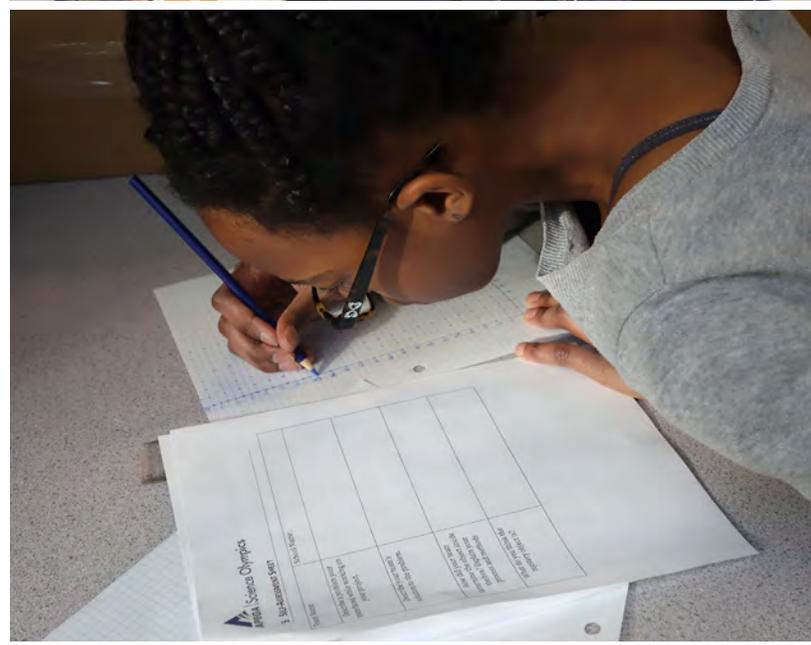
*@handc\_yang*

These P. Eng's are ready to judge @APEGA\_AB #SciOlympics today!



*@Elmwood\_EPSB*

GOLD!!! Thank you @APEGA\_AB for inspiring our future scientists. 🏆 #sciolympics #stem #EPSB #scienceinquiry



**THANK YOU, VOLUNTEERS**

Without volunteers, there would be no APEGA Science Olympics. This year, an amazing 308 volunteers logged 3,190 hours to ensure the success of all eight events.

Sharing their passion for the professions with youth, they exposed students to engineering and geoscience problems facing our world—and inspired them to come up with solutions.

Thank you, volunteers, for your commitment to the next generation of engineering and geoscience professionals.



Top, students in Medicine Hat test their aqueduct. Above, students in Edmonton put the final touches on their amusement park ride.

# Make an Impact

## Build the Future by Volunteering

### Volunteer Opportunities

- Boards, Committees, and Panels
- Community, University, and Youth Outreach
- Mentoring
- Special Events

Current APEGA volunteer opportunities are posted on the volunteering section of the APEGA website

### Volunteer Benefits

- Earn Continuing Professional Development Credits
- Expand Your Business Network
- Develop Skills, Knowledge, and Experience
- Give Back to Your Profession
- Have Fun

*Note: Your acceptance in a particular volunteer position depends on space being available and the suitability of your qualifications.*

### Contact APEGA Volunteer Management

1-800-661-7020

[volunteer@apega.ca](mailto:volunteer@apega.ca)



# Share Your Knowledge and Experience

APEGA members are needed for the following volunteer opportunities

## Appeal Board Panel

Committee members are needed for the Appeal Board, which provides Members and the public protection of their statutory right of appeal and their right to natural justice.

## Discipline Committee Members

Committee members are needed for the Discipline Committee, which hears and decides on complaints of unskilled practice and unprofessional conduct against APEGA members and permit holders, brought before it by the Investigative Committee.

## Wetlands Science and Engineering Working Group Members

APEGA is seeking geoscience and engineering professional members for the Wetlands Science and Engineering Working Group. This group aims to produce a practice guideline for implementation of the Alberta Wetlands Policy.

## Subject Matter Expert Panel Members—Outsourcing of Professional Work

APEGA is seeking panel members who are subject matter experts on the sourcing of professional work. The panel will help enhance APEGA members' awareness of outsourcing issues of a professional nature through the combining of two existing practice guidelines into a single *Professional Practice Standard for Outsourcing of Professional Work*.



## Mentors

APEGA invites experienced professional members to volunteer their time to mentor less-experienced members. Mentors are matched with mentees to provide guidance in many areas of their career and professional growth.

## Environmental Practice Standard Panel Members, Environmental Professional Standards Subcommittee Members

Panel and subcommittee members are needed for the Environmental Practice Standards Panel and for the Environmental Professional Standards Subcommittee. This subcommittee ensures APEGA professional practice standards, guidelines, and bulletins related to the professional practice of environmental engineering and geoscience are adequate to protect the public interest.

## Geoscience, Engineering Professional Standards Subcommittee Members

Members are needed for the Geoscience Professional Standards Subcommittee and the Engineering Professional Standards Subcommittee. These subcommittees ensure APEGA professional practice standards, guidelines, and bulletins protect the public interest.

## More volunteer opportunities

### Permit to Practice Seminar

Presenters are needed to deliver in-person Permit to Practice Seminars, which inform Responsible Members of their duties and provide guidance on the creation of their Professional Practice Management Plans. Volunteers must present at least twice between September and June in either Edmonton or Calgary.

**NOT  
CURRENTLY  
AVAILABLE**

### Requirements for Registration Seminar Presenters

Presenters are needed to deliver in-person seminars on APEGA's requirements and process for registration. Volunteers must present at least twice between July 2018 and June 2019, typically in either Edmonton or Calgary.

### Expert Witnesses in Geoscience

APEGA seeks two geoscience expert witnesses for short-term contract positions. These individuals will assist APEGA's Compliance Department with specific compliance cases.

### Edmonton & Calgary University Outreach

APEGA members and human resources professionals are invited to use their valuable knowledge and experience at fun and worthwhile university student events, aimed at helping students prepare for their entry into the industry.

### APEGA Science Olympics

APEGA's K-12 outreach team seeks enthusiastic volunteers interested in sharing their passion for engineering and geoscience with students. Volunteers will be responsible for developing creative engineering- and geoscience-related projects for the APEGA Science Olympics. Successful applicants can be located anywhere in the province. Meetings will take place in Edmonton and Calgary, but there is an opportunity to participate remotely. Application deadline is September 3.

### Subject Matter Expert—Registration Committee

APEGA is looking for members to serve as subject matter experts (SMEs) on the Registration Committee. An SME's primary duty is to review and provide recommendations on whether an applicant for professional registration has met our requirements for registration.

### National Professional Practice Exam Question Authors

APEGA seeks volunteers to help produce new, high-quality examination questions to add to the National Professional Practice Exam item bank to be used on future administrations of the exam.

For further information on any of the opportunities listed here—or other APEGA-related volunteer opportunities—please contact:

**APEGA Volunteer Management**  
**1-800-661-7020**  
[volunteer@apega.ca](mailto:volunteer@apega.ca)

You can also check out the [volunteer section of the APEGA website](#).

# MEMBER BENEFITS

Eligible APEGA members can take advantage of the following discounts. Complete details of these group benefits can be found at [apega.ca](http://apega.ca) under [Member Benefits](#) and Member Insurance. Due to seasonal or other limited-time promotions, the member discount may not be the lowest price—you are advised to compare. APEGA does not hold any member insurance profile or policy information.

To inquire about these benefits, check your eligibility, or provide service feedback, please email [memberbenefits@apega.ca](mailto:memberbenefits@apega.ca).

## TRAVEL



Hotel and car rental travel search engines  
Below-market travel discounts



5% off current national rates



10% off current national rates



10% discount value with valid APEGA Member card

## FINANCIAL



Financial Planning Services: 20% discount for APEGA Members

## PERSONAL



10% off select regular priced items



15% off on resume services



Market-leading, bring-your-own-device rate plans



10% off admission, IMAX, and annual membership

## INSURANCE DISCOUNTS



Professional Liability Insurance

Pro-Form Sinclair Professional, A division of



Secondary Professional Liability Insurance



GARRETT AGENCIES

Manulife Authorized Advisor



# IN MEMORIAM

Between September 1, 2017, and June 30, 2018, APEGA received notice of the of the deaths of the following Members.

## Past-Presidents

[CHAMBERS, Thomas, P.Eng.](#)

[HUME, James, P.Geoph.](#)

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YAMAMOTO, Douglas, P.Eng.

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KIRK, Fraser, G.I.T.

KONDLA, Danielle, G.I.T.