"Apply the science and your knowledge, and remember to enjoy the view."

An interview with Ken Mitchell

A seasoned geophysicist, Ken demonstrates a broad technical and business perspective by his successful collaborations with teams and corporations globally. Born in a US Army hospital to Scottish parents and whose father was a commissioned officer of the RCN, Ken is a citizen of the United Kingdom and a proudly naturalized Canadian. His early life in a navy family saw relocation to several homes across Canada. With assignments that have had him live and work in-country (in the USA and Indonesia) his background provides Ken with a significant global perspective.

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After graduating from the University of Western Ontario in 1980, Ken worked for Chevron Standard, Union Oil, Pioneer Natural Resources, Canadian Forest Oil and Vero Energy. Prior to joining Vero as Manager of Geophysics, Ken had a 5-year stint as a consultant during which he delivered expertise to multinational energy corporations, Canadian junior start-ups and emerging technology ventures. Recently, Ken has reactivated his company K A PROJECTS, providing focused strategic services to Vero, and also working on new business ventures.

With current, engaged technical skills and hands-on business experience, Ken also strives to collaborate with colleagues from other disciplines to build successful exploration and development programs.

Ken has volunteered his services with participation on committees of the CSEG, serving on the Executive as Treasurer, as a former regular contributor to The RECORDER, as a co-chair of the CSEG Chief Geophysicists’ Forum, as a Convention session chair and as a mentor to technical teammates. He has presented several papers and made presentations promoting the science and business of Geophysics and Exploration. His audiences have included CSEG Convention, NAPE and CAPL Prospect Expo and CGF delegates as well as international scientists in the People’s Republic of China.

The RECORDER approached Ken for an interview in early 2012, but had to be patient in view of Ken’s work commitments and recent corporate transitions that kept him busy. Following are excerpts from the interview.

(Photos courtesy: Joyce Au)

S: Ken, let’s begin with the first question – tell us about your educational background and your work experience.

K: Sure, I graduated from the University of Western Ontario in the Honours Geophysics program with a concentration in Geology. To provide practical insight, I was fortunate to have had work experience that included a field summer with the GSC – permafrost studies in the Mackenzie Delta and the Beaufort Sea and also a summer working in Calgary with Amoco. The economic times encouraged all of us, all our graduates to look seriously at the oil industry, so upon graduation I took a position with Chevron here in Calgary.

S: Which year was that?

K: 1980 – part of a golden age for the Calgary energy industry. Our graduating class numbered about 6 between Honours and B.Sc. classes and we were all wooed by the Calgary industry and enjoyed multiple offers to choose from. Chevron was a technically sound company, and certainly very much oriented to geophysics at the time. Both Ken Allen (a fellow classmate) and I were attracted to these aspects and went to work for Chevron.

S: Yes, I know Ken.

K: And the fact that my brother David was already two years ahead of me at Chevron as a geophysicist kind of helped out a little. I had some insight through him of the technical excellence of the organization.

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S: So, since then?

K: Oh, Chevron offered an environment that supported continued learning that was very hands-on. This included extensive geologic field schools and formal geophysical courses. We were also exposed though job rotation to all aspects of the exploration process and geophysical applications: seismic processing, seismic interpretation, field acquisition, and in fact I was in the field group for about a year, deployed out to seismic shoots throughout Alberta, BC and even the Maritime provinces – supervising crews, reviewing invoicing, participating in stakeholder liaison and performing quality control on recording. That was an influential experience and excellent grounding in the realities of what how our business works. So Chevron offered great training in the real world.

But it was also a big corporate machine, and I was junior, impatient and wanted more responsibility and direct involvement with active drilling E&P decisions. After about five years into my career, Chevron had just purchased Gulf and a merger was in progress. There was considerable question at that time whether the merger would include the Canadian entities (it turned out that didn’t happen). Amid this uncertainty, I left Chevron and went to Union — a company that had suffered some tough times through the NEP (National Energy Policy) period and seemed to be ready for an upswing. I had the privilege of working for some good geophysical leaders there. Ken Shaw and Cec Keeping of course were two big influences at Union at the time, successive Chief Geophysicists and they were great to work for and to learn from. There I also learned about the outside world of the Calgary industry – seismic processing contractors, industry E&P partners, data brokers, etc.

At Unocal I was able to travel the world while actively working on exploration projects. We were working here in town, in Calgary, on many projects all over Alberta, B.C. and the North and then in 1990 I transferred down to Oklahoma City to the regional headquarters for the Mid Continent and Rocky Mountains for the Unocal Corporation. After T. Boone Pickens had taken shaken up Unocal’s Los Angeles headquarters, Unocal entered a period of organizational adjustment and re-adjustment. In 1990 the corporate E&P strategy for the US was one of regionalization as opposed to centralization. There was effort to have staff out into the producing regions closer to the action, with more local knowledge and that sort of business approach. Out of Oklahoma, we tried to corral the exploration and development activity of a vast geographic mid-Continent region that included the Rocky Mountain States, the Michigan & Illinois Basins, the Arkoma Basin and even a little of Appalachia. Just as corporate strategy had prescribed regionalization as the flavour of the day, the next group of management consultants advised that centralization was the answer. So, before we knew it, by 1992 the centralized model with Houston as the main US headquarters was back in style.

At that time I was transferred to Indonesia – Unocal Indonesia was a very active exploration and development business unit that focused its high cash-flow activity in or just off the coast of Borneo, the province of East Kalimantan, with risky exploration ventures spread throughout the archipelago. There I had the privilege of working with a diverse group of
geo-scientists, engineers, logistics people – from all over the world – on a massive project to grow that asset. It was a real eye opener, it was quite a dynamic operation.

S: Were you based in Jakarta?

K: We were based in-country, actually on the island of Borneo, in East Kalimantan at the seaside town at Balikpapan where Shell had rebuilt a war-ravaged refinery located there post WW2 – so we lived and worked in a compound, virtually on the equator in close proximity to the main producing fields, and our core operating areas. A few miles inland was tropical rainforest.

S: And then after you got back?

K: I returned to Union in Canada to pursue large scale exploration supporting a North American Gas Strategy at the time. It was all high risk targets, deep in the Devonian, frontier plays in the North West Territories, some plays in B.C., largely geared towards material, high impact gas exploration, all very high cost, high risk, high reward. However, by the late 90’s the Unocal Corporation saw more merit to selling the Canadian assets while retaining an interest in the Alliance pipeline mid-stream. So as Unocal Canada wound down, that’s when I went over to Pioneer Natural Resources. Pioneer had just acquired Chauvco and was staffing up for significant growth. However, the wheels came off their economic model and Pioneer down-sized significantly six months after I had joined on and I was thrown from the wreckage, at least figuratively. After Pioneer, while renewing some industry connections, I met up with Jim Taylor, a former Unocal colleague – a veteran geologist with considerable foothills and frontier expertise who was then at Canadian Forest. CFOL needed some frontier geophysics expertise and I was delighted to have a chance to work with Jim again. At that time, Canadian Forest was looking for stranded gas in the McKenzie Delta/Beaufort Sea. They were also exploring B.C. Foothills, the southern North West Territories and there were complex structural, fractured reservoir problems to solve.

S: And then after that you went on your own?

K: I did, although it wasn’t necessarily by conscious choice. I’ve always enjoyed regional exploration but in the early 2000’s, the Forest Corporation decided they wanted to get out of higher risk exploration and focus more on plays with development-type risk. Phil Anschutz of the Anschutz Ranch, Utah family wealth had been a significant investor in Forest and a key promoter of Forest’s high risk gas ventures, but by 2002-03 he was reducing his financial position in Forest and the strategic E&P climate at Forest was due for some transition and frontier exploration was shut down in 2004. I was getting a little weary of external factors swinging the direction of corporate exploration objectives and the stability of my employment. So, it was somewhat logical to go out into the industry as a consultant and become my own boss. I was quite honoured and thankful that I had a lot of industry friends and former colleagues that were eager to hire me and my company to help them with their projects. It started slowly at first, but began to build momentum and my client base became incredibly diverse, offering interesting work and I became very busy. I had a good five years of consulting until one of my clients persuaded me I join them as an employee. So I saw the wisdom in effectively servicing a single major client, put my corporation on hold and became a full time employee with Vero Energy.

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When I joined Union they had been coming out of bad times — hard hit by the National Energy Policy (NEP) and they were re-inventing themselves. They had attracted good people like Cec Keeping to accomplish this. Ken Shaw as the chief geophysicist was very supportive of the geophysical staff. There was a lot of hands-on work with immediate impact on active drilling programs. Whereas Chevron was a big machine with big technical power, it seemed that the full technical arsenal was not always available to all the corporate business units.

Meanwhile, the Union environment was such that technology and budget seemed more accessible and Ken and Cec really fostered and stimulated that accessibility. Unocal’s Calgary office was a big supporter and contributor to applied geophysical research at Unocal’s Science and Technology group in Brea, California. This afforded me a great opportunity to collaborate with a wide variety of geoscientists with a world-wide perspective.

With Unocal in the US, I experienced a little different cultural perspective when I transferred to Oklahoma City. The Calgary patch is very close-knit, somewhat comfortable, we all know each other and there certainly is some of that element in the U.S., but there are several major energy industry centres and therefore more regionalism. Some people don’t like to move out of Denver, Louisiana, Dallas, California etc. to go to Houston and vice versa—and the Oklahoma office attitude was somewhere in-between. In OKC, there were native Okies as well as professionals from Texas, the mid-west, the eastern seaboard, California and even Alaska. As for the office culture, there was always this over-hanging feeling of transience. Oklahoma certainly offered a good, affordable family lifestyle, four beautiful seasons and recreation opportunities, but everyone knew that Houston and Dallas industry centres were like magnets. Many professionals dreaded the possibility of transfer.

In Indonesia, of course, the culture was very different on so many levels but one memorable impression I had when I first came into the Balikpapan office was that there was something unusual in the air and it took me 20 minutes to figure out that it was the cigarette smoke. Coming from North America, smoking was virtually a criminal offence in offices by the early 90s and to walk into an office full of smoke from a mixture of local clove Djarums and ‘luxury’ Camel or Marlboro cigarettes — these thick clouds hanging in the air was just a snapshot in time — it seemed quite odd to me. Ironically, I learned that the Unocal Balikpapan office burned to the ground years later….faulty wiring, apparently.

One day, preparing to do some interpretation from paper seismic sections, I asked one of our Indonesian technicians to have the sections printed on pre-fold paper, to which I was told that they didn’t have pre-fold paper “in this country.” I was a little confused, but came to realize that this actually made a lot of sense. In all aspects of our activities – land seismic crews, oil-field maintenance or fabrication, office support, security— anything, there were a lot of labor intensive operations that created employment and local benefits— including pre-fold paper (or the lack thereof). Why would you buy expensive pre-fold paper when you could employ local manpower to fold that paper for you? Cost and logistics of course entered into it because imported goods were not only expensive but trade tariffs as well as import and tendering protocols were time consuming. Meanwhile there was an army of available workers that needed to feed their families—that economic reality certainly was prevalent. So living and working in-country was a great experience – not only was the work fascinating but there was always lots of local nuance.

The expat work ethic was also worth noting. Living in the compound meant that you were available 24 hours a day and 7 days a week. You lived and worked with your colleagues and it was a great way of stimulating technical integration. On Friday night we would all gather at the company club and have drinks and dinner and while socializing we were also talking about the what-ifs and brainstorming on how
we could improve on our projects—our exploration and production effort. Engineers talking with geologists and geophysicists, some logistics people, service vendors—and out of those informal discussions hatched some creative ideas like “Saturation Exploration” and “Stacked Template System” (STS) drilling.

I recall one of our veteran drilling engineers, an ex-military man who was eagerly asking me about our pore pressure predictions from seismic data—from all angles it was an amazing ferment of technical culture.

S: From there you come to Canada.

K: That’s right—familiar ground, but I’d been away from Canada for four or five years. Calgary had had some tough economic years, yet the city had grown and changed physically also. GST had been introduced to Canada during my absence—a little cultural change to which I had to adjust. It certainly did strike me how easy it was to accomplish simple tasks within our local energy industry—things like fast-turn around seismic processing, licensing data with delivery same-day and so on. Calgary was ‘pick up the phone and get it done.’

At Forest—Canadian Forest there was a very exciting growth culture. Phil Anschutz was a significant investor in Forest at the time so the quest for large-scale, high impact opportunity in gas into the North West Territories was the mandate, so—a ‘go big or go home’ attitude was certainly present at Forest.

And then in my own consultancy (K A Projects or KAPL) I saw many different cultures from junior start-ups to majors and super-majors. This included Burlington Canada—characterized by a young, active and happy team that was focused on growth. I remember how surprised I was when I heard genuine laughter breaking out in the Burlington hallways—a welcome atmosphere.

Another client with some cultural twists was B.G. Canada, part of the B.G. Group—intensely process and safety oriented with a British flair. With my own Scottish heritage, I sometimes found myself translating metaphors for Canadians or the British expats. (‘…back of a fag-pack economics’ = ‘back of the envelope economics’ or trying to explain the ‘…run and shoot…’ of American football in terms of the FIFA game.) The financial resources of B.G. Group are just staggering but to unlock those resources there was a tremendous amount of technical rigor, presentation and consensus building.

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that had to be satisfied before the funds were released.

And some of the small companies I have been associated with, the cultures are very personal. There is a high sense of interdependent commitment and responsibility among each professional discipline. Decision making has almost a family culture to it – it’s like risking or spending our own money.

S: You have a diverse experience gathered during your professional experience. Ken let me ask you this; do you ever get stressed out at work or outside work? What is your biggest “turn-it-off” approach?

K: Probably the most stressful thing I do of course is raising my triplet sons – steering them clear of disasters of their own making, let alone life’s dangers! But these three little guys are also, they are probably one of my best sources of being able to turn it off because, yeah, a “triple hug” from all of them always goes a long way in melting any stress. I also play my piano and get to hammer out some chords or dabble with some counter-point to refocus. Golfing, skiing, cooking, wine making (and tasting of course)....all have some stresses of their own, but certainly provide me with some recreational outlet. And within our geophysical community, our group activities like the Doodlebug, Doodlespiel and Ski Spree are great events that make our business much more bearable.

Like our geophones work and life both seem to oscillate in somewhat of a sinusoidal manner. I find it sometimes relieves a lot of unnecessary stress when we come to understand that it’s all “just physics” and the oscillation motion never really ends.

Finally, on a more practical note, I usually walk to and from work in downtown Calgary – that involves some daily physical activity but the most important thing that I do is to appreciate watching the sun rise on the Rocky Mountains and walk through the natural beauty of Prince’s Island Park, so above all else it’s important to maintain perspective and to “enjoy the view.”

S: Absolutely, yeah. Ken what career accomplishments are you most proud of?

K: Well that’s hard to answer! I think I will be most proud of things I am going to accomplish in the future. Of my past accomplishments – I really think they have been team accomplishments throughout my career – I was fortunate to be able to play my role. So it’s difficult to identify discreet accomplishments that are greater than others. Working on major offshore projects like Hibernia, Hebron, Ben Nevis, Terra Nova or Attaka, Mahakam Delta / Kutei Basin or big foothills discoveries like Bullmoo-Sukunka (Permian) were certainly significant. Early work by Unocal on 3-Component methods and identifying a Vp/Vs signature of the Swan Hills at Caroline, Alberta was another team effort that I especially enjoyed. And at Fort Liard and the Central Mackenzie of the NWT, there were many highlights including some big rate gas wells at Fort Liard from the Nahanni formation and some pioneering multi-component regional 2D surveys shot between Colville Hills and Fort Good Hope. But helping Vero to grow production by 100% probably had more relative impact. So overall my best accomplishment may have been thriving for over 30 years in this Industry— making meaningful contributions to several teams while working with great people.

My company KAPL is maybe the single tangible demonstration of this....it’s my experience and reputation wrapped up in a little corporate package. Clients have shown that they like the product, they seek me out and they have renewed contracts. Meanwhile, KAPL coordinates well with other vendors and suppliers, enjoying credibility and a high degree of trust and mutual respect.

S: Alright, tell us something about a challenging project that you may have worked on?

K: Probably one of the most challenging files I worked on was at Canadian Forest where we believed that we had identified some basin center gas resources in the Liard Basin in the North West Territories and our job was to prove this to the National Energy Board in Significant Discovery Application (SDA), which would lead to a declaration of a Significant Discovery License (SDL), in a resource play before resource plays were the flavour of the month. But what this entailed was to focus one of the most integrated presentations I have ever been involved with and with the rigor and the preparation that is worthy of an under-oath formal presentation within a National Energy Board hearing setting – organizing the staff and expert witnesses, integrating all the technical and economic story, preparing with lawyers – it really manifested in the full sense of integration.

S: All right, good. You have mentioned some of the early landmarks in your career; would you like to elaborate on that or do you have something more to share with us?

K: Well I think what was most influential was seeing great technical people in action – and I certainly got a lot of that at Chevron but even at my summer at Amoco working with guys like Larry Mathews and geophysicists of that caliber, it really demonstrated to me how the technical aspects of our trade are powerful and I think it’s always good to maintain the focus on that technical aspect.

At Chevron, the ability to rotate through and get actual hands-on experience in processing, interpretation and field acquisition and seeing the problems that arise you know, it’s eye opening and I think it makes you appreciate, not so
much what you’ve learned but what you really don’t know.

At Unocal, Ken Shaw and Cec Keeping fostered an environment that encouraged collaboration with the Research staff at Unocal Science and Technology (S&T) in Brea, California. This afforded hands-on applications in studies such as 3-component recording, processing and interpretation, advanced migration, potential fields and reservoir characterization. As early as 1988, the Unocal Canada office made it a priority to have a PC-based geophysical workstation on every geophysicist’s desk – just another tangible demonstration of the progressive leadership shown by Cec Keeping and Ken Shaw.

S: Now, we have seen many geophysicists become more like geoscientists when they start working as consultants. Looking back now, do you think that was a good decision? Have you found it has its own challenges, and demands or different style of functioning?

K: Yeah, I wonder sometimes if consulting is something we deliberately choose to do or if it’s something that evolves because of lack of attractive alternatives. I don’t believe that we can put together a business plan that picks a career milestone – a date that we are going to start consultancy and then you execute this detailed plan.

KAPL – the name of my consulting corporation is an acronym that denotes “Knowledge Application”. Maybe that best describes the process that guides me to and through my consulting. My business offers real world expertise that delivers a product to clients that’s about timely opinions, recommendations, and support for decision making. Some of the most surprising feedback I have had from clients is when I made an assessment and a recommendation to them that I cannot help them on this project at this time given the parameters that were laid out or the realities of timing or costs. Despite ‘bad news’ the reaction that I get is one of relief and almost pleasure from the client. They are happy about that kind of a recommendation because it’s black and white. I think what clients hate is grey. So either you are helping them and you are recommending a location or a course of action or you are recommending moving on, let’s do something else.

I can see in hindsight that it was an excellent decision to enter the consulting sector. I think my career
was ready for that challenge, I had the skills, the maturity, the contacts and the credibility and I was able to deliver well for my clients. But it was also a lot of hard, grueling work.

So, I would advise others that aspire to consulting that it’s best to learn the craft well, get your footing and establish your own credibility. Let the consulting come as a logical outcome when you’re ready but not to rush to it as a conclusion.

S: **Right, prepare yourself for it. Based on your experience, what is required for doing good and effective exploration?**

K: I don’t think exploration can be good and effective unless it is truly integrated — a product that considers all aspects of the geosciences and the engineering and the economic and business realities. It is absolutely paramount to balance all of these. During the late 70’s and early 80’s, and especially in WCSB reef plays, there was some attitude in the Calgary industry that geophysics and specifically seismic was a magic tool that needed little integration. Ironically, within Chevron where there was such a strong geophysical expertise, seismic still had to be integrated with the geology and engineering to pass muster. Any time that one discipline thinks, believes or purports that they are the single solution I think that’s poor exploration.

More recently and specifically thinking about resource plays, there is some industry attitude expressed that the business is a simple factory process. Engineers may want to lead the charge and frac reservoirs (that are assumed to be homogeneous) harder or bigger or better, but I think those attitudes need a reality check and a refocus on integration. Going back to the reservoir and working with all disciplines; balancing all the inputs is really the key component in good exploration and development.

S: **Very good. So with respect to this integration that you are talking about, do you think new geophysical technologies hold the promise of characterizing the reservoirs better?**

K: Yeah, I believe so, I think we are seeing that now. I think there are some significant trends in our field that are leading to greater geophysical characterization and understanding of the rocks and reservoirs. Recent applications in the area of seismic attributes, rock mechanics, stress and strain, microseismicity and anisotropy — all that detailed information that lies within the seismic signal have a contribution to make. But these contributions will not be easy—they require good quality seismic data, good seismic acquisition, maybe even reshooting old surveys and careful processing. This all requires time and money and it really is incumbent upon good exploration teams to allow for the time and cost of good geoscience—not just geophysics but also looking at all the available rock and log information that underpins a sound geologic model and the engineering factors, so yes, I think there is a lot of promise for more reservoir detail. As we attempt to quantify and support more dependable reserve reporting and better business decision making, I think these technologies will become increasingly important.

S: **Very good. Ken, going by what you mentioned in the foregoing answers, you have been a successful interpreter. You have held on for the last 30 years and done well, so what would you say is required to become a good interpreter?**

K: You must understand the basic science first — the geologic and geophysical sciences — so that you can choose and apply them to the different projects that you come upon. So you first have to be a scientist and understand the basic concepts.

To digress to an analogy, I was reading Keith Richards’ autobiography, the famous Rolling Stone, guitar player/song writer / riff master. Keith talks about the electric guitar and how when he was developing his style — passionate about the blues, rhythm, guitar sounds — that everybody wanted to be a lead guitarist playing electric guitar like Pete Townshend and Jimmy Hendricks. Yet, although he loves the sounds you can make with electric pick-ups and electronics, Keith says you’ve got to learn how to play on acoustic first. You’ve got to be able to make the chords, to move your hands through the progressions, to play the notes — the effects and all the electronic stuff is exciting — wonderful, but you’ve got to be able to play, you’ve got to understand the instrument. I believe Keith goes on to suggest that you should sleep with your guitar in this quest for musical understanding. And I think this may apply — in a twisted, convoluted way — back to applied geophysics. Before we go amped up on high tech attributes, algorithms and applications, we have to understand the basic science behind it all. Further, we must have good field design and acquisition, otherwise you’ve got a poor foundation and you’ve got to understand the processing steps to take, the limits of your data before you can proceed.

Meanwhile, it’s wise to bear in mind your technical and economic objectives. We have to accept limitations of our data and try to use technology while being mindful of the risks and errors that we have allowed into our interpretation. Hmm — successful applied geophysics based on Keith Richards’ musical fundamentals — let’s see if anybody follows up with me on that....

S: **Tell us Ken, over the years, what new technology ideas you have gradually assimilated in your interpretation and has the outcome of some of these been favorable and why do you believe so?**

K: In my early days at Chevron, I was often struck by the effects of basement structure — often subtle — on Devonian carbonate deposition in...
Alberta. From my training and interest in magnetic and gravity methods, I saw patterns and correlation so I was quite interested in the 1990’s era GSC and Lithoprobe investigations of basement heredity supported by HRAM techniques and basement seismic transects. Increasingly in my WCSB work, I like to layer up maps with a variety of basement, Devonian, mag, gravity and similar regional inputs to understand younger reservoir deposition. I strongly believe that basement heredity and reactivation have profound impact on the multi-zone stack of reservoirs in the WCSB.

I am continually seeking opportunities to use seismic attributes and pre-stack data to support my work. During my Unocal days in the late 80’s and 90’s, I actually had a lot of interaction with the Science and Technology group out of Brea where we were looking at these techniques; even back then we were looking at seismic attributes, cross plotting, characterization, fuzzy clusters – these worked to some degree to describe our plays. Unfortunately we were using them mostly on 2D data so that when we got something working on a 2D stack, then we jumped a mile or two away to the next 2D line – there were so many variables and we didn’t have 3D continuity that would really map out the reservoir detail. Although interesting, what struck me was – well I can already detect that subtle anomaly on the stack or a partial stack or some fairly rudimentary product and that the fact that I could see it better or more colorful in another dimension in another domain was interesting but it maybe was not that practical.

Increasingly now in my modern practice, when I have the luxury of extensive 3D data I find even simple attributes are very useful and not just the values of the attributes themselves, but the continuity within a three dimensional volume and the subtleties that become apparent and have geologic depositional meaning. These details are difficult to capture on a loose grid of 2D. I often promote the power of larger, more regional 3D volumes that support better understanding of our plays and reservoirs. Sometimes, we need to rely equally on information about our reservoir targets as well as the rocks that we want to avoid – the “regional” response. We need detailed information on both. Relying on larger 3D volumes, I have observed the continuity and compartmentalization of reservoir trends. Within the WCSB I have also been surprised how productive reservoirs from two wells are somewhat connected even though they may be separated by 10-15 sections.
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3-Component recording and interpretation also hold my interest. I have been working with these techniques since the 1980’s with Unocal.

Recording of shear waves opens our interpretation options up to many possibilities. While consulting for BG International, we conducted a regional 2D seismic program in the Colville Hills region of the NWT. Apart from a 6km test line conducted in the Mackenzie Delta, I believe this was one of the first production programs shot in the NWT that recorded full waveform data. Given the high costs of logistics to acquire the Colville Hills data, the incremental cost of 3C recording was not significant but may pay dividends to interpreters in the future.

In structured, foothills or similar terrain, the exploitation of pre-stack time and depth migration offers obvious benefits as they better position our interpretation of the subsurface. And the estimation and application of anisotropic effects further adds to successful imaging. When we combine these techniques with tighter group intervals or bin sizes, the improved resolution is quite impressive.

S: So at this stage in your life Ken, what personal and professional vision are you working towards?

K: Well, I am an old Dad with young kids, and I take a lot of satisfaction and joy trying to raise three little boys into young men. I look forward to helping them develop their own path through life, whether I’m guiding them down a double-black diamond, coaching them at soccer, working with them on their spelling words, or seeing them off to college.

Professionally I like what I am doing, I like working with teams and coming together and creating more than the individual components, the sum of the work of individuals is greater than what each brings. I know a lot of young people in this business and I take a lot of interest in answering their questions and trying to stimulate their interest – helping them out and also getting them to inspire me and to teach me a few things.

So the vision that I am working towards is pretty simple, I strive to stay viable and technically engaged. I believe I can best achieve this by continuing to meet and work with good people that share an enthusiasm for collaboration.

S: Very nice, good. That could be the title of your interview. All right, let's switch gears here a little bit, and let's hear your comments on the future of the Canadian Oil Industry.

K: Well, I think the Canadian Oil Industry has a long and bright future, assuming that hydrocarbon energy is a product that will be in demand for some time. Of course the clean burning nature of natural gas, which we are very rich in, seems to indicate that it is not a bad economic assumption and of course our demand on oil, heavy oil, is evident and we have a fairly abundant supply of that. In the back-drop of that is the very basic geo-technical fact that we have several prolific petroleum systems working in Western Canada. So much so that we often hear expressions that ‘...we don’t have to worry about hydrocarbon source in the Western Canadian Sedimentary Basin...’ – which is probably a bit of a naive over-statement. I think we certainly do have to worry about source and the timing of the migration of hydrocarbons, but the fact is this is a prolific basin and there is an abundance of source rock and there has been a lot of migration into a variety of reservoirs. Now we have reached an era where we witness some of the resource plays that attempt drilling into the source rocks themselves. So in a fairly stable government and political regime and with an abundance of technology-enhanced supply and resource, I think we will continue to explore, develop and exploit those resources well into the future.

S: How do you think our Industry is handling the high price of the barrel and do you think such high prices encourage oil companies to invest or acquire or implement new technology?

K: I think there are two facets to that equation. The current price of the barrel of oil – the liquid product – is fairly high and at the same time the price of the natural gas volume is remarkably low and that creates a great deal of stress and strain. Of course the obvious thing is it currently favors the exploration and development of oil right now, but this could change quickly in response to shifts in the world economy.

So – how is the Industry handling it? – I think they are handling it with a bit of a wary eye. Oil prices may be up right now, but the commodity price is volatile – I believe economic discipline is incumbent upon the Industry. Corporations have to be careful they don’t over-extend based upon optimistic price forecasts. This is part of the attraction of the large-scale heavy oil prospects and even regional gas resource plays. Here, operators are setting up the long-term investments and long-term production streams. The commodity price will fluctuate over the life of those projects, but there is an averaging effect that will allow reasonably accurate estimations of price for the producing cycle. And the problem with many of our smaller gas prospects – the speciality of our smaller producers, is they tend to have shorter life cycles. So if you pick the wrong year or years to develop your big gas well, you are going to get a much, lower total return.

Wouldn’t it be wonderful to clairvoyantly pick the perfect year to turn on your best gas wells? And of course gas wells generally have a more aggressive decline curve than oil. So good companies are taking the high price per barrel and the low price of the gigajoule or million cubic feet in stride. They are not over-reacting to it, they are attempting to keep their balance sheets on-side and they are making decisions for the long-term while ensuring continued cash flow.

They are certainly exploiting technology. There has been an explosion in the use of advanced drilling and completion technologies and they allow us to maximize the results from individual wells, they allow us to produce from reservoirs that aren’t really reservoirs. Those technologies are omnipresent in the Industry right now, horizontal wells, the stimulation techniques and the geo-technical tools.
to guide them. Microseismic for example, certainly has a lot of promise. I am not convinced that it’s as widely used as it is going to be. If we proceed carefully as good technical practitioners I think we are going to create a lot of value by applying microseismic methods – through optimization of our drilling and completion programs. If we don’t do it properly I think it is going to be discounted as one of those weird sciences.

S: Engineers still love it.

Ken, you are a registered member of APEGGA, a Professional Geophysicist. Tell us from your experience how does becoming a member of APEGGA help? There are not very many geophysicist members of this association, so that’s why I ask the question.

K: Well it is interesting... to me it’s not really a decision to become a member of not, it’s simple – I am qualified, I went to a Canadian University and graduated with a degree in geophysics and I was able to apply to and become an APEGGA member as the law states I am required to do, to practice in Alberta. So for me it’s really just compliance like getting my driver’s license.

S: And as a consultant, you need that.

K: To some degree that’s true. As a professional designation it broadcasts, “I have the qualification, I may be able to stamp and sign off on aspects of your Reserves Report, or act as your expert witness etc.” Some clients care about that, but a surprising number don’t, but it’s clear that your client pool is surprising — there actually has been a time before the CSEG took it over, that for many years has organized the review of abstracts for the SEG Conventions, and he has repeatedly button-holed me to help him in that process and I was happy to do it for a couple of reasons, one of them, to give back and to contribute but you also get to pre-read some pretty interesting technical pieces and give some feedback and encouragement to authors in that process, hopefully making a better convention for everybody.

Meanwhile, I have, in fact, volunteered for SEG because there is this fellow at Arcis, Satinder Chopra, that for many years has organized the review of abstracts for the SEG Conventions, and he has repeatedly button-holed me to help him in that process and I was happy to do it for a couple of reasons, one of them, to give back and to contribute but you also get to pre-read some pretty interesting technical pieces and give some feedback and encouragement to authors in that process, hopefully making a better convention for everybody.

S: You’re right there is a procedure in place so people have to go through that, and some of them find it overwhelming.

I notice you are a volunteer for the CSEG, so first let me ask you this — what are your reasons for doing so?

And secondly, have you ever thought of volunteering for the SEG also?

K: I think it’s good on so many different levels to volunteer, especially for your local technical society. I was very fortunate, both the SEG and especially the CSEG helped to fund my education, my first year at University, my scholarship was actually an SEG scholarship, at a time before the CSEG took it over, but these technical societies made contributions to my education and it is natural to want to give back. But you know, in a selfish kind of way I think there is a lot of give-back in the other direction, working with our technical society, it raises our profile, it helps enhance the image of our discipline within the community and you meet a lot of great people which is gratifying on a personal level but also valuable on a technical and even corporate level, getting to know people, it gets you plugged in.

S: Cont’d

“Apply the science and your knowledge…”

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**INTERVIEW**

“Apply the science and your knowledge...”

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From my experience, this includes seeking opportunities to work on a variety of projects, in a variety of geologic basins or play types and if the circumstances are right, to work in different countries around the world. I strongly believe that the more rocks you’ve seen, the more insight you bring to new problems.

Meanwhile, it’s also important to realize that sometimes our magic works, sometimes it doesn’t and sometimes the reality is we don’t have time or the money to perform the required analysis. But above everything — apply the science. This requires that first, objectives are well understood, consider the potential of geophysics contributions; second, understand how we can integrate with our geologic colleagues, our engineering colleagues and ultimately, if we are in the energy or mining business, to produce some profitable result. For most of us in the resource sector, our science really is motivated by business and it has to have a fundamental business purpose — and we have to be prepared to accept that sometimes good science isn’t the only priority.

So start off and understand the science, understand the basics, look for opportunity to apply the science and it all cascades from there.

S: Very good. Ken, thank you very much for giving us this opportunity to sit down and chat. It has been a pleasure talking to you.

K: Thank you Satinder. R

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**Nataly A. Zerpa** is currently working as a geophysicist at BP America Inc. At British Petroleum, she is doing subsalt seismic interpretation of deepwater Gulf of Mexico. She received a M.S. degree in Geophysics from Colorado School of Mines in 2011 and a Bachelor degree in Geophysical Engineering from Universidad Simon Bolivar (Caracas, Venezuela) in 2009. During her time at Mines, she worked as a research assistant in the Reservoir Characterization Project (RCP). At Mines, she received the BP scholarship for the 2010-2011 and 2011-2012 school year and the ConocoPhillips SPIRIT scholarship for the 2011-2012 school year.

**Thomas L. Davis** is currently Professor of Geophysics at Colorado School of Mines. At Mines he guides the leading edge research of the Reservoir Characterization Project, whose mission is to develop and apply time-lapse (4-D), multicomponent (3-C and 9-C) seismology to improved recovery. He has been an organizer of technical conferences, workshops and Continuing Education programs for the SEG. Tom was the SEG’s Second Vice President in 1989, Distinguished Lecturer in Spring, 1995 and Technical Program Co-Chairman in 1996. He received the C. J. Mackenzie Award from the Engineering College of the University of Saskatchewan in 1997, the Milton B. Dobrin Award from the University of Houston in 1998, the Colorado School of Mines Dean’s Excellence Award in 1999 and the RMAG/DGS Best Paper Award at the tenth annual 3-D Symposium in 2004. In 2007 he was awarded the Melvin F. Coolbaugh Memorial Award from Colorado School of Mines.