



## SOUNDS IN THE SUBSURFACE: FIBRE-OPTIC DISTRIBUTED ACOUSTIC SENSING

SHELL HAS INSTALLED THE INDUSTRY'S FIRST PERMANENT FIBRE-OPTIC DISTRIBUTED ACOUSTIC SENSING (DAS) TECHNOLOGY IN ONE OF OUR WELL BORES. THIS TECHNOLOGY ALLOWS US TO "SEE" WHAT OCCURS BELOW GROUND DURING HYDRAULIC FRACTURING OPERATIONS.

"While we have tools that can sense temperature and measure other parameters, DAS creates a more detailed picture," said Bill Westwood, Manager, Technology Excellence and Deployment. "The technology accurately measures fluid, sand and rock movement and gives us a high-resolution image of the subsurface near the wellbore."

The optical fibre installed in the well is comparable to that used by cable TV and the telecommunication industry. Each fibre is about the size of a human hair, but is able to carry immense amounts of data. DAS collects data by sending pulses of light along the fibre travelling at 300,000 metres per second. Any small impurities in the fibre will cause some of the light to be reflected. This reflected signal is then interpreted by the surface electronics in real time to provide information boosting our understanding of subsurface activities. "It is like having microphones in the well from top to bottom – everything can be heard," said Bill.

DAS also helps to reduce potential environmental impacts and footprint of the well site by requiring less equipment, decreasing site traffic and noise. It has taken more than six years of collaborative effort to bring the product this far.



An example of a fibre-optic cable configuration which is used for DAS. Within the above cable, there are four strands illustrated – two single mode fibres and two multimode fibres.

In 2013 Shell conducted the first DAS commercial application at Groundbirch in well H11-09. The team was able to conduct tests on two different completion methods, leading to another significant discovery. "We evaluated production data for 180 days and were able to show that one fracture design, which is initially more costly, gives us better reservoir access over time," said Mathieu Molenaar, Senior Production Engineer. "Without DAS, we would have had to drill up to 10 test wells to come to the same conclusion."

"The full potential for this technology and others which are fibre-optic based has yet to be fully realized," said Alan Reynolds, Project Execution Manager, Technology Excellence and Deployment. "It is a game changing key technology which promises a lot more in the not too distant future. The significance of this achievement by Shell in Groundbirch is huge!"

## MONTNEY MOMENTS

### AN UPDATE FROM PHILIPPE GAUTHIER, GENERAL MANAGER, GROUNDBIRCH



We often talk about "building a lasting Groundbirch." This means developing and empowering our PEOPLE to be the BEST at what we do. We aim to become a respected industry leader in Northeast BC for our COMMUNITY, as we GROW our business for the benefit of everyone.

For our staff and contractors, it means taking pride in what they do and being able to go home everyday knowing that they've made a positive impact through their work for the community as neighbors, family members and friends.

Every day I see the continuous drive at all levels of the organization towards these focus areas. On the PEOPLE front, I'd like you to "meet" our new Operations Manager Wouter de Klein in this issue's "Operations Update." A big thank you from our entire team to Rej Tetrault for helping us set a foundation for a best in class asset. I am excited to see the same dedication and passion Wouter is bringing to our operations, our people and our community.

We are delivering visible steps towards being the BEST at what we do. This means using innovative solutions to work more efficiently, using less resources, while reducing our impact to our surroundings. An example of this is our "Dual Fuel Project" highlighting our work to allow diesel equipment to be operated using a mixture of up to 70% locally produced natural gas, reducing greenhouse gas emissions.

Helping our COMMUNITY grow and prosper is a core pillar for us. This summer we supported youth programs like *Let's Talk Science* and *Daddy and Me*. We also strengthened our understanding of our neighbours through activities such as West Moberly Cultural Awareness days. I'd like to thank our community for challenging us to be the best that we can be in our most recent Rural Roots and Resources session and hope to see the same open dialogue in our upcoming Open House detailed in this newsletter.

I'm very proud to see a mindfulness of critical resources, such as water and air, and our communities ingrained in the way we work. We thrive to GROW our business while making the community a better place to live and work. As leader in Groundbirch, this will always be important to me.

Regards,  
Philippe Gauthier



## OPERATIONS UPDATE

### INTRODUCING WOUTER DE KLEIN



HELLO, MY NAME IS WOUTER, THE NEW OPERATIONS MANAGER FOR GROUNDBIRCH.

I'm from the Netherlands but spent the last five years in the United States. I moved to Fort St. John in June with my wife, son and daughter just in time to catch summer. We've been impressed by all the outdoor activities in the Peace region – we went camping for the first time in years! Our kids spent the summer playing outside and biking in the neighbourhood. The people have been so friendly – it's been a great beginning for us.

I am very excited to join the Shell Groundbirch team. It's a very energetic team with a lot of experience. I'm very impressed by what they have accomplished over the last couple of years using innovative solutions to grow our operations in a responsible way. I look forward on building on that and further improving ourselves to grow in this region that my family and I will call home.

Groundbirch has the potential to be an important cornerstone for Shell in Canada. To "build a lasting Groundbirch," we need to get safety right every day. We look out for our colleagues and friends working on the team and continue to stay vigilant towards safety for our community and environment. We want to be the employer of choice, providing families continued peace of mind that their loved ones will return home safely. We also work hard to responsibly produce our gas and manage our products while helping to build a thriving community.

In the next few months I hope to meet many of you in person as my family and I settle into our new home and start actively participating in the community.

**Wouter de Klein**

## THE DUAL-FUEL PROJECT: NATURAL GAS AND DIESEL IN ONE TANK



An aerial view of a Groundbirch well pad, where machinery is currently being run off Dual-Fuel.

THE NATURAL GAS INDUSTRY HAS GROWN STEADILY IN BC OVER THE PAST YEARS. DESPITE THIS, MOST COMPANIES IN NORTHEAST BC POWER THEIR LARGE EQUIPMENT WITH DIESEL ENGINES AS THEY ARE CHEAPER TO RUN, EASIER TO FIX AND LASTS LONGER THAN A GASOLINE ENGINES.

At Shell Groundbirch, diesel was continuously trucked and transferred at well pad sites to power equipment as the asset did not produce diesel in the area. With continuous increases in diesel demand, the team was determined to find a more efficient solution with opportunities to enhance operations and positively impact the environment.

The Dual-Fuel System technology supports Shell's ongoing effort to reduce greenhouse gas emissions as a part of a

Greenhouse Gas and Energy Management Plan. The Dual-Fuel system allows diesel engines to operate on a mixture of diesel fuel and natural gas. "Natural gas is a cleaner burning fuel, offering positive impacts on our local air quality," said Anar Hamzayev, Groundbirch Wells Supervisor and Project Lead. "This technology allows us to use locally produced natural gas, requiring less diesel to be trucked to our operations. This reduces truck emissions, potential safety incidents, traffic and labour requirements."

### THE TECHNOLOGY

Conversion to Dual-Fuel is a small modification to the engine with an external installment on the engine. The Dual-Fuel System's proprietary and patented technology allows the engine to operate on natural gas mixtures of up to 70% of total fuel consumed. After the conversion,

the engine can still be operated on 100% diesel fuel without loss of power or efficiency. The design allows for switching of fuel methods without interruption in engine speed, power or stability.

The Dual-Fuel System utilizes a fumigation gas delivery method where natural gas is delivered to the cylinders via the standard engine air-intake system. It is then ignited by a diesel "pilot" that acts as an ignition source for the air-gas mixture. Gas quality and composition are critical factors for the Dual-Fuel operation. "We are proud of the high specification of gas produced at Groundbirch" said Anar. "It readily meets the natural gas quality and composition standards set by engine manufacturers."

"Safety is at the heart of everything we do and was scrutinized throughout the implementation of this project. An intensive risk and safety assessment took place before the project could start along with numerous safety precautions such as installing air quality sensors. These additions further exceed industry safety standards at Groundbirch," Anar added.

The Dual-Fuel System allows us to use local natural gas, an abundant and safe energy source that is already used by Canadians in their vehicles and homes. Natural gas is a cleaner-burning fuel than diesel, propane and heating oil providing potential dramatic reductions in emissions of carbon dioxide and smog-causing sulfur dioxide and nitrogen oxides.

Dual-Fuel helps tap into a secure local energy supply for operations in the region. "Stakeholders are increasingly interested in Dual-Fuel, especially on longer-term projects, where local gas is available. Groundbirch continues to share its learnings to ensure other assets have the opportunity to improve their environmental, operational and safety compliance," said Anar.



## WEST MOBERLY CULTURAL AWARENESS DAYS

The fourth annual West Moberly First Nation (WMFN) cultural awareness event was held on July 24, 2015 in conjunction with their treaty day celebrations, which have occurred for almost three decades. The training was developed through a collaboration between Shell and WMFN. The cultural awareness training and treaty day celebrations have brought Shell employees and their families to the community for an immersive experience on WMFN culture, while fostering a relationship between the company and community. Guests joined WMFN on reserve land, located on the west side of Moberly Lake, for this year's three-day long celebration.

WMFN is a community of approximately 250 members with approximately 100 members living on reserve. In addition to fostering relationships, the community holds this celebration each year to mark the signing of Treaty 8. Throughout the celebration there were various events including a volleyball tournament, axe throwing, bannock making, hand-game competitions and the endurance run.

"West Moberly is very proud to host cultural awareness days with Shell. It is an opportunity to share our culture, build awareness and enhance the understanding between the two differing entities," said West Moberly First Nation's Chief Willson.

Over the three days, groups rotated through three half day sessions. The sessions were taught by members of the four main family groups. If a Shell participant wishes to learn something specific, WMFN accommodates by connecting that participant with the appropriate instructor.

This year, four Groundbirch employees and their families attended. This included Philippe Gauthier, General Manager; Daniel Stevens, Operations Engineer in Training; Ruvimbo Chinake, Operations Engineering Intern; and Mindy Henry, External Relations Advisor. Along with their families the group participated in the following courses: traditional herbs and medicines; community and cumulative effects; bannock and dry meat making; family/First Nation history in the Treaty 8 territory; Pugeesi (which means traditional hand games) and traditional drumming.

"I wasn't sure what to expect but it turned out to be an experience I will never forget. It was a fantastic opportunity to learn more about the rich culture and history by taking part in traditional games, through talks with the Chief and Council members and workshops on traditional medicines and plants. It was a really fun and memorable weekend. I'd recommend it to anyone," said Daniel Stevens, Groundbirch Operations Engineer in Training.

This is a yearly event and Shell looks forward to participating again next year. For more information on this event, please contact us at **1-888-384-6465**.



Participants watch as an Elder explains the different types of traditional herbs found in a nearby forest.

## IN THE COMMUNITY

### FOSTERING FATHERLY FUN



Darren Walker enjoys time with his two daughters during a pony riding event. Photo credit: Eye Candy Images by Margaret

*Daddy and Me* community events provide a great opportunity for Dads, Grandpas and other male caregivers to enjoy an activity with their children – newborn to age six. As many Dads work shift schedules in the area, their availability may be limited. This program provides Dads with a set time to bond with their children as well as receive tips, information and support from the Community Bridge staff and other participating Dads. Events are held once each month from September to June where Dads and kids enjoy various activities such as: gymnastics, story time, swimming, Taekwondo, skating, visits to the petting zoo among other activities.

"The activities chosen are quality activities meant to enhance the child's gross and fine motor skills, social skills and cognitive skills. Community partners provide the venue and specialized coaching, expertise, and equipment making these valuable learning experiences for the children," said Community Bridge Executive Director, Karla Marsh. "The events are planned around times when working Dads are available and is promoted through the Community Bridge website and directly through e-mail."

For most activities no pre-registration is required. Dads and kids are encouraged to drop-in and register at the time. Dads that participate get to experience activities with their children either by doing it alongside their child or by guiding his or her participation. This provides an opportunity for Dads to increase their knowledge of child development as well as learn positive parenting practices. It also gives Dads a chance to see what captures their child's attention and what interests their child may have in the future. The program also offers a great opportunity for Dads to casually connect with others, building their support networks in the community.

"*Daddy and Me* is a great program which I enjoy participating in," said *Daddy and Me* participant Darren Walker, Contracts Manager for Shell Groundbirch. "I find life can get busy, but having a pre-determined date set aside makes it easy to commit. Being able to just show up and join the pre-planned activities keeps things interesting and fun." The events are coordinated by Community Bridge staff who partner with community agencies and businesses to offer the events. Healthy snacks are provided at each event. The *Daddy and Me* program has been offered in the community for the past eight years and attendance has been growing. In 2014, 160 children and 113 Dads/Grandpas spent time together while attending an event.

For more information on this program, or upcoming events, visit the Community Bridge website at [www.communitybridge.ca](http://www.communitybridge.ca).

### PROGRAM IGNITES SCIENCE PASSION IN STUDENTS



Local students get creative during a science project hosted by the *Let's Talk Science* program.

Enthusiastic cheers rang out from students in Fort St. John, Saulteau First Nation and West Moberly First Nation in June when they welcomed staff and volunteers from *Let's Talk Science*, an award-winning, national, charitable youth development organization.

The students took part in a project with *Let's Talk Science* which develops and delivers unique learning programs and services that engage children, youth and educators in science, technology, engineering and math (STEM). Shell Groundbirch committed \$66,000 to support the implementation of local school community projects, providing youth a chance to explore learning opportunities and related career pathways in STEM.

"We aim to inspire futures. By exploring STEM students build the critical thinking, questioning, problem-solving and team work skills necessary to live and work in an increasingly complex world," said Dr. Bonnie Schmidt, Founding President of *Let's Talk Science*. "It's not about memorizing science content; it's more about the process of discovery that we're trying to offer students."

With the support of Shell Groundbirch, *Let's Talk Science* returned for a second time to deliver hands-on/minds-on activities for students from all three communities. More than 550 youth attending Bert Bowes Middle School and Moberly Lake Elementary School (where both West Moberly and Saulteau First Nation students attend), as well as 87 youth and six adults at the Northern BC Regional Science Fair in Dawson Creek have participated in this program. *Let's Talk Science* also introduced 25 educators in the region to its suite of programs and resources, and offered more in-depth professional learning sessions on inquiry and project-based learning to 10 educators at Bert Bowes Middle School and Moberly Lake Elementary School.

By connecting the students and teachers in these communities with *Let's Talk Science* and Shell Groundbirch, this community development project has been a win-win. An evaluation study conducted on the effectiveness of this project highlighted an increase in student interest in science-related material. Students stated they were more likely to take optional STEM courses and more likely to continue in a STEM-related post-secondary course. The study also found the program increased educator awareness of the importance of STEM indicating 100% of the educators felt that bringing STEM topics into the classroom is "very valuable." For more information about *Let's Talk Science* and its programs, please contact Bryant Bird at [Bryant.Bird@shell.com](mailto:Bryant.Bird@shell.com).



# RURAL ROOTS AND RESOURCES PARTICIPATE IN A SATURN TOUR



The RRR tour group before they head out on the Saturn Tour.

RURAL ROOTS AND RESOURCES (RRR) IS A LOCAL GROUP COMPRISED OF SHELL REPRESENTATIVES AND RURAL RESIDENTS FROM WITHIN SHELL'S GROUNDBIRCH AREA.

The purpose of the group is to work together on issues related to Shell's operating presence as well as important issues identified by the rural residents. Through RRR, Shell members and residents not only collaborate on strategies to address specific issues, but also share information, learn from and engage with one another. This process also includes the opportunity to involve other industry players and Government for specific issues.

On June 13, 2015 Shell Groundbirch hosted RRR members on a tour of the completed Saturn plant. During the construction and commissioning phase of the Saturn plant, RRR was updated on the status of the project during each meeting. Now complete, this tour was an opportunity for members to see the project they'd be involved with, ask questions and share comments. After the tour was complete, Shell hosted a BBQ lunch on site. If you would like more information or are interested in participating in RRR, please contact us at **1-888-384-6465**.

## JOIN US FOR OUR FALL OPEN HOUSE!

Join us for dinner, door prizes and to find out more about Shell's upcoming plans for our Groundbirch venture. All community members, including families, are invited! No RSVP required.

For more information, contact us at **1-888-384-6465**.



### WHEN

**Thursday, October 22, 2015  
5 p.m. to 8 p.m.**



### WHERE

**McLeod Community Hall**



### THE GROUNDBIRCH GAZETTE – SHELL'S NEWSLETTER FOR NORTHEAST B.C.

THE GROUNDBIRCH GAZETTE IS A BIENNIAL NEWSLETTER FEATURING SHELL STORIES FROM THE GROUNDBIRCH AREA. IF YOU HAVE ANY QUESTIONS, COMMENTS AND/OR IDEAS FOR STORIES, PLEASE CONTACT US AT **1-888-384-6465**