

WorldWide Drilling Resource®

Volume 13 June 2016

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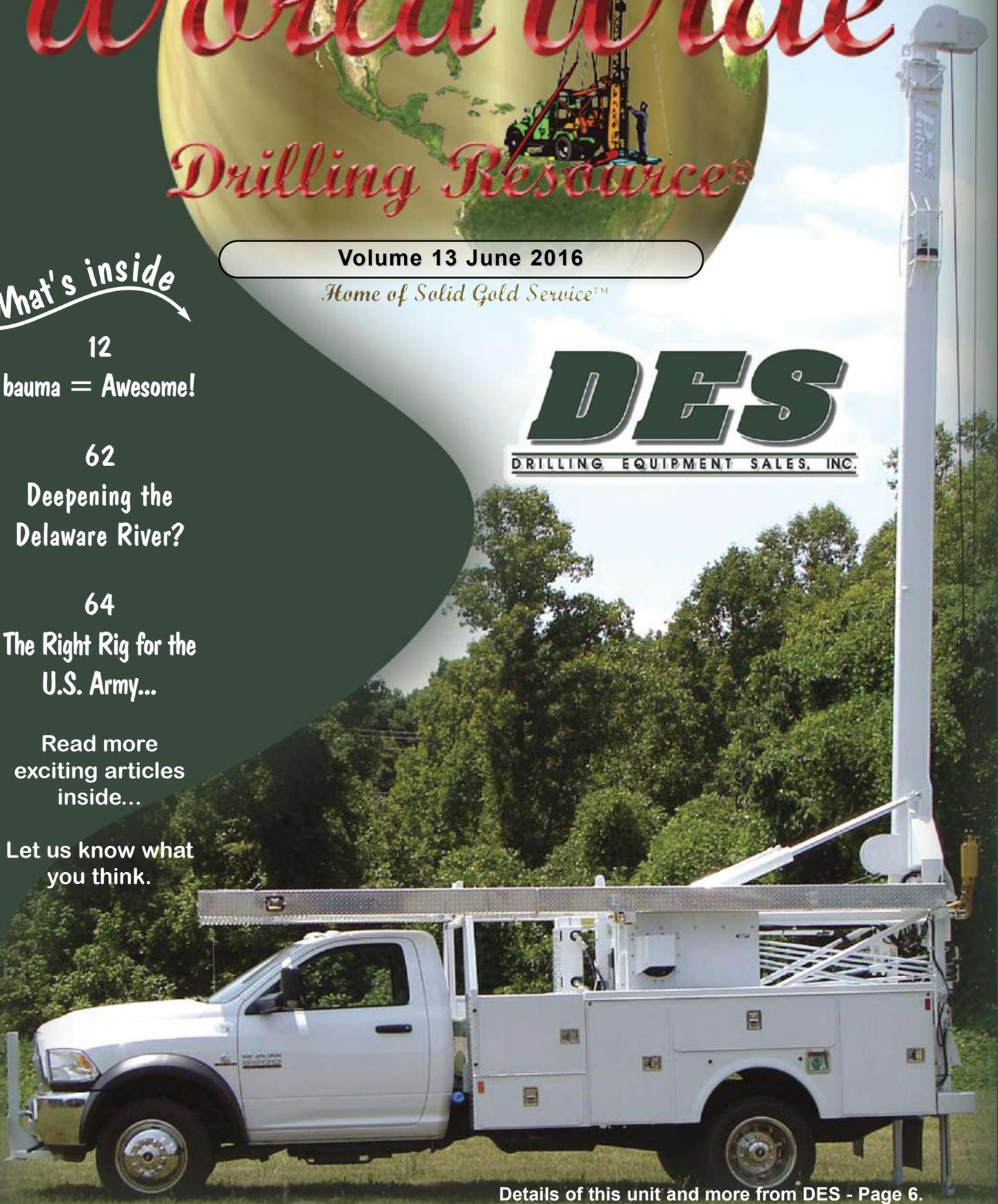
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Ronnie,
Managing Publisher

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Ever heard these words? "Best-laid plans of mice and men." So be it here at *WorldWide* as well.

WWR Team was readying the Work 'N Play RV to head west to this year's **GEFCO** Fundamentals in Drilling Seminar, but alas it was not meant to be. Weather conditions which prevailed across Oklahoma and continued across the south, kept that flight grounded. We were all extremely disappointed Troy was not able to share this exciting time he has waited for all year to be side-by-side with drilling contractors and those in charge of the classes. But, as gracious as they are, **GEFCO** totally understands safety concerns and has us looking forward to next year's training event and Daphne tells us they will be happy to share on-site photographs with you here in *WorldWide Drilling Resource*[®]. Hopefully, they will appear in our July issue due to printing schedules. You will also be able to see the training photos online.

Training is vital in every industry, but drilling is a grueling profession where you MUST BE ever VIGILANT, keeping one eye always keen for safety hazards. These can be as innocent looking as a screw on the floor of a shop - imagine walking across the shop with a heavy object in your hands, your foot slides across that screw... You can finish the outcome.

The National Drilling Association, of which we are a member and attend every year as it moves around the country to its vast chapter locations, is the MOST vigilant association I know with regards to safety. They may not be involved in each and every drilling function you are, but it would pay you tenfold to attend their conference for these safety talks, get their safety stickers, and even their many publications. I personally have found them very informative, even for our daily office activities.

Do you find yourself looking for extension cords or wires across the pathway? Greasy towels piled in a corner? Windows left halfway open (this will surely allow someone and perhaps even a child the ability to climb in and possibly hit that concrete floor and not be found until Monday morning - when it is too late). I do. YOU SHOULD.

As we move ahead into this month of June, we start with a valiant effort of the **Ontario Ground Water Association** in Canada as they work toward bringing CANADIAN DRILLING CONTRACTORS back together again. That gathering has been missed and is vital to each and every drilling contractor to communicate with each other to learn from different ways of accomplishing their tasks each day, training seminars, new technologies, and more. PLAN TO ATTEND - *WWR* will help you with the details - go to our website and click on their link.

But alas, here it is **JUBILEE** time as well. Early this year! HEADS UP! Be sure to check out our website and click on their link for the latest. *WWR* will be there, looking for you and your future drilling professionals - THIS IS **JUBILEE** - children are welcome!

SEE YOU ON THE TRAIL!

We'll be the ones with the smiles! And a "Positive" Attitude! No frowners allowed!



~ From the Cover ~

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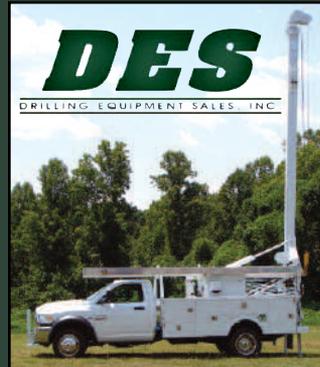
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Harry Short (In Memory Of)

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Boiling Water

by Bill Corey

Pentair Water Training Institute

So boiling water means changing it from a liquid to a vapor. I like to talk about "My Cousin Vinny". It is a very funny movie about two boys who leave New York City and head to Florida for spring break. As they pass through Alabama, they stop at a store called Sac-O-Suds. Vinny's cousin collects food in his arms to the point he can't hold it all, so he puts a can of tuna in his pocket, then goes to the checkout, and pays for everything except the tuna.

They continue on their way and are soon pulled over by the local police. Wondering why, he reaches into his pocket for his license and finds the can of tuna. To his companion, he says, "I stole a can of tuna. What do you think they do to you for that down here?" He admitted to the crime, and then found out they were looking for a murderer. Of course, he had just admitted to it.

The first witness under oath says, "I saw those two boys go into the Sac-O-Suds, then I went over and made my grits, and came back five minutes later, and saw them two running out of the Sac-O-Suds."

Vinny comes to his rescue and asks the first witness under oath, "Did you use instant grits?" to which the witness answered "Why, no respectable Southerner would use instant grits." Vinny then said, "So what were they, Magic Grits? How is it your grits cooked in five minutes when everybody else in the grit cooking world takes 15 minutes to get the water hot?" The witness had to admit he was away from the window for more than five minutes.

What do we learn from this little movie snippet? It takes about 15 to 20 minutes to boil water. This is what happens when you put a pot of water on a gas stove. After about eight minutes, vapor bubbles start to appear on the bottom of the pot. What happens to them when they break loose? It looks like *Illustration #1*. Most folks will say, "They float to the surface." I then ask if they're sure, to which they begin to get a little concerned about their answer. Then I say I will give them a little hint, and show them the next slide that looks like *Illustration #2*.

When the hot bubble hits the colder water it implodes, not explodes. And imploding bubbles give off more energy that will cause damage to a solid item.

Then I tell them, once the water gets hot all the way through, the vapor bubbles go to the surface and explode. I clap my hands together and show imploding bubbles make a lot of noise and will cause damage to a solid item, like an impeller.

I tell them to prove it to themselves; go home, set a teakettle on a gas stove, then listen and watch. What will happen? In about eight minutes, you will hear the teakettle get noisy, and if you look at it, it will start to rock. This is not the end, but the beginning of the experiment. Keep listening and watching and you will hear the noise go away, and the rocking will stop. Now you can amaze all your friends by telling them, "It's going to boil now." Of course, I continue and say, "Okay, so you won't amaze your friends, but that is what will happen."

Remember, there are two ways to boil water; raise the temperature of the water to the vapor pressure point of the water, or lower the vapor pressure over the water to the vapor pressure point of the water. In pump language, boiling is called cavitation.

Next, we'll talk about submarines.

Bill

Bill Corey may be contacted via e-mail to michele@worldwidedrillingresource.com

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Rockmore Unveils Revolutionary Rod System

Adapted from a Press Release by Rockmore International

Rockmore International launched its new Vector Rod System at the bauma exhibition in Munich, Germany. Conceived to be a major breakthrough in improving performance and service life of extension drill tools in surface and underground percussive drilling applications, the new line of drill tools promises tremendous advantages in productivity and reliability.

After several years of intense research and development, followed up with monitored field tests in various ground conditions, Rockmore engineers developed a new thread design, XT, for the Vector Rod System. The new XT design incorporates revolutionary new guided cylindrical contact zones between the male and female thread joints. These guided surface features are located in the nose and rear of the thread connections and serve various benefits and improvements over traditional threads.

The XT thread profile is based on the traditional trapezoidal T-thread design and is compatible with industry standard thread types such as T38, T45, and T51. To achieve the full engineered benefits of the XT thread, one must consider the drill string as a system of connections between the shank adapter, rods, and the bit in extension drilling applications. The XT thread design employed in the Vector Rod System enables many performance and reliability benefits leading to major overall cost savings in the drilling cycle.

"We specifically targeted to increase thread service life while enhancing drilling performance in extension drilling applications," said Pejman Eghdami, executive vice president of Rockmore International. The dual cylindrical contact zones in the nose and rear of the XT threads significantly increase the lateral support between thread joints, and stabilize the connections with more rigidity to provide better energy transfer. The enhanced thread support and geometry extends thread life and increases the overall component service life of the shank adapters, rods, and bits with XT threads that comprise the Vector Rod System.

Since the XT thread guide feature improves thread alignment, the impact duration when rattling rods, as required in uncoupling connections, is minimized. This leads to lower wasted energy transmission, cooler couplings on rods, and ultimately to longer rod life. Thread grease is also better retained on the thread pitches resulting from the new XT geometry, further increasing thread life in all XT components.

Another key advantage of this rod system over traditional threaded components is, it provides straighter holes and minimizes deviation, which is critical in modern drill and blast techniques. The guided XT thread feature increases the rigidity and stability of the connections between the shank adapters, rods, and bits so significantly, overall rod bending is minimized and hole straightness is improved. In fact, this improvement allows for larger and deeper blastholes to be achieved using existing rod diameters, but only by converting to XT threaded components. In underground mining long-hole and production applications where up to 30 rod connections are common, hole deviation can be reduced substantially by using Vector Rods.



WDR was excited to be at the bauma event for the Vector Rod System unveiling.

According to Eghdami, "As a major breakthrough for extension drilling systems, we have significantly improved drilling productivity and increased drill string life-time by introducing new design features in the XT thread configuration...just as important, the new XT design is fully reverse compatible with industry standard T-style threads, enabling the Vector Rod System to be truly remarkable, yet a practical choice for premium drilling tools."

The Vector Rod System is offered in multiple configurations of button bits, MF rods, and shank adapters. These drill string components are available in XT38, XT45, XT51, and XT60 thread types, designed to improve drilling productivity and reduce extension drilling operating costs in surface and underground percussive drilling.

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by Carol and Marcel Schimpf, *WorldWide Drilling Resource*®

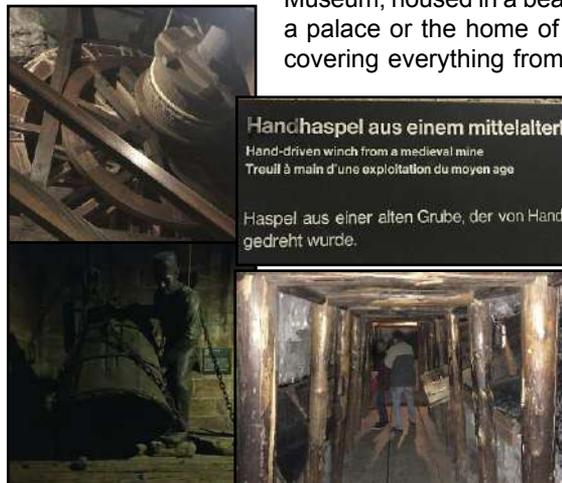


Boarding our plane for the 9½ hours to Munich, we were excited, but not anticipating the long, cramped journey. The flight was uneventful, and we arrived on Saturday morning slightly jet lagged, but with our luggage intact and ready to explore!

After a long taxi ride, we arrived at the hotel right in the heart of Munich and checked in. Our room was perfect, but we noticed when we turned on the air conditioning, only heat blew out. Checking at the desk, we were told the hotel had not yet turned on the air conditioning because they still had some cool nights. The only solution was to open the huge windows and let in the cool breeze. We did so, and the windows stayed open for our entire stay.

Rather than submitting to the jet lag and the seven-hour time change, we decided the best cure was to do some walking since we had the first day to ourselves. Munich was, as it was three years before, gracious and welcoming, crowded with people on the streets, in the squares, and on the public transportation, enjoying the mild weather and shopping before the stores closed for Sunday. We paced ourselves and did some sightseeing, such as Marienplatz, Hofbräuhaus, and other inner city places of interest. We ended the first day back at the hotel with nice drinks and a huge, freshly baked pretzel.

On Sunday, we awoke somewhat early and decided on an educational day at the Deutsches Museum, housed in a beautiful old building, which surely must have been a palace or the home of someone important. Huge rooms of displays covering everything from ancient travel to steam engines to an actual mining experience surprised us in each new section. Information on plaques was usually in German and English to make exhibits accessible to all visitors. Even though we didn't get to all the exhibits in half a day, we decided we were leaving richer in knowledge than we came, so we went to find a restaurant. A real Bavarian restaurant was nearby, so we enjoyed some local fare and refreshed ourselves for the rest of the day.



Monday was the grand opening! We readied ourselves early and caught the U-Bahn for the 30-minute trip to the show. As expected, it was packed, and we had to wait for the next train because there was simply no more room for us to squeeze in on the first

one. Arriving at our last stop, we disembarked and fell in with the crowd walking toward the entrance some distance away. Already, the conglomeration of various voices and languages was the first hint this was truly a worldwide event!

Directed to the second floor for our press passes, we were able to avoid the rush as a crowd of more than 580,000 visitors from 200 countries moved through the turnstiles to enter the show. We moved out to the second floor overlook and were glad to be above rather than amidst the crowd!

Since the weather promised to be sunny, we decided to cover the outside area of bauma first and cover the inside exhibits on Tuesday. With over 3423 exhibitors from 58 countries in attendance, we had a lot of ground to cover. We walked over nine miles to meet as many exhibitors as possible (there were no comfortable shoes, even if they started out that way!)



Beginning at one corner, we walked all the aisles, finding our first company, Atlas Copco, where we chatted with representatives who were already busy with customers. After snapping some photos, we continued down the aisles coming upon Astec Group. This time, we were lucky to find a representative who had time to show us the new equipment and tell us their expectations for the show. Walking further, we discovered an area rich in drill rig companies. There we met and chatted with many old friends, such as American Augers, Soilmec, and Casagrande, and made some new friends also.





After talking with numerous companies and receiving updated information about their products, we realized it was already time to go to the Case Construction press conference. Inside their exhibit hall, we were greeted by Nuria, who invited us to join them for a light luncheon provided especially for the press. Following the refreshing lunch, we were directed to the top floor for the press conference. The room filled quickly with standing room only for late arrivals. Four speakers provided information about the company itself and their latest products. Once the formal press conference ended, we were invited to tour the exhibit area to see the new products. However, because



time was limited, we had to forego this opportunity to explore more of the outside area before we returned for the trip to the gravel pit. This was a good move because we were able to meet with several other companies like Comacchio, Fraste, Eijkelkamp, Doosan, and Vermeer. Vermeer had a unique setup in their area with benches, street lights, and trees, giving the effect of a little park in the town center.

We realized that time for the awaited trip to the gravel pit was fast approaching, so we hurried back over to Case Construction to board the tour bus. After a short, scenic drive, we arrived and were amazed to see huge machines not just sitting there, but working, moving, and showing their capacity to get the job done. We observed the particular uses of the equipment as they maneuvered; then we were invited into the on-site refreshment trailer for drinks and light snacks. Everyone was invited to experience driving one of the machines, with the operators riding shotgun, of course! Marcel readily agreed to drive one of the large trucks, and with a big smile, took off to make the round. Shortly afterward, we boarded the bus again, and Case Construction was gracious enough to take us to a nearby golf clubhouse for a Bayrische Brotzeit, the typical Bavarian light food and drink. What a perfect end to an exciting and enjoyable day!



The second day of our coverage arrived on Tuesday. This day promised rain and delivered, but it was only raining lightly when we left the hotel for the U-Bahn. Once at the trade show, we noticed it was raining harder. All the people who would have gone outside were jamming inside. What a boon for the inside exhibitors who said Monday had been slow because of the nice weather outside!

We decided to be methodical with our coverage of the inside halls, starting with the U.S. Pavillion. Since we were quite early, some booths still had no representatives available, but we did see a huge press conference taking place at the Volvo exhibit.

The first company we saw at the U.S. Pavillion was Numa Hammers. Here we had some time to chat about how Monday was slow but they still made some good contacts. We continued our coverage of the U.S. Pavillion, circling back around to catch those companies which were not there earlier. Because it was raining outside, the inside companies were rather busy with customers.

Branching out from the U.S. Pavillion, we toured other halls and stopped to talk to many companies. At some exhibits, we waited, but the best we could hope for were busy shots because all representatives were talking to their customers. Although many companies we talked to were new to us, they were very interested in meeting us and receptive to having their photos taken for magazine coverage of the show.

Once we had completed four more huge halls, we returned to the outside area, which was again packed because the rain abated and the weather was nice again. Pushing through the crowds, we spotted some interesting displays, took many more photos, and began to look for Hinowa. We finally found the company's exhibit and were greeted by Susanna, who invited us into their exhibit office for some snacks and drinks. We talked about how Monday went for them and about their new products.

Then it was time to return to the drill rig area to meet with Silvia from MASSENZA. Seated at a little table on their office porch, we discussed what **WDR** can do for companies.

Next, it was time for lunch, so we began to search for one of the many huge beer gardens set up at the show. After eating, we went back to the inside halls to contact companies which were too busy earlier. This time we were lucky to be able to talk to Center Rock, Acker Drill, and Rockmore International. All said they were having a successful day. Photos and smiles were abundant!

Upon finishing the rounds at two more halls, it was time to leave the show. While walking back to the U-Bahn, we realized how achy our feet were and decided we would need to put them up for a good rest before the long flight back in the morning. Tired, but feeling accomplished, we repacked for the long trip home and rested.

bauma 2016 turned out to be even more outstanding than the show we attended three years ago, bauma 2013. We learned many exciting details about the new products and equipment heading to the mining and construction industries, and we can't wait to share the information with you, the **WDR** readers, over the next few issues.

Many compliments to the organizers and companies for a job well done in showcasing products and services!



BREAKING NEWS

Grant Applications Sought for Water Projects and Educational Programs

The National Ground Water Research and Educational Foundation (NGWREF) is seeking grant applications for groundwater research projects, water supply projects, and educational programs in developing nations, as well as the United States.

The NGWREF Board of Directors recently approved \$15,000 for research grants, \$35,000 for developing nations grants, and \$10,000 for grants from the USA Groundwater Fund. Applications are being accepted through June 30, with grant awards to be announced on or before October 1. Applicants should be a 501(c)(3) or equivalent.

The Groundwater Research Fund provides funding for cutting-edge research projects which stimulate new knowledge, information, programs, and products to advance groundwater science and technology. The Developing Nations Fund provides small assistance grants to benefit the quality of life for people without access to plentiful potable groundwater; funds can be used for a groundwater supply grant or a water well system-related education and training program. The USA Groundwater Fund was established to help meet groundwater needs in the U.S. The fund has a three-part purpose: education and training of groundwater professionals, public education and awareness, and support of construction projects to improve the potable water supply to communities and individuals in the United States.



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WHO'S IN THE NEWS



WDR photo of Louis at the 2013 Utah Ground Water Association event.

After many years of working in the drilling industry, Louis Sanders retired in February. Formerly with Green Bit & Tool in Wyoming, Louis moved his family to Phoenix, Arizona, in 1998, to work with Drilling Equipment Supply. In 2002, he joined Bill Johnson Equipment Company (BJE) where he worked until his retirement. BJE hosted a party for Louis which included Tom Poley's (of Atlas Copco) band playing and singing some great old cowboy songs. The event was enjoyed by all.

The **WDR** Team joins the Arizona Water Well Association in wishing Louis and his family well as he pursues new "ventures" in his retirement.

Send your Who's in the News to: promotions@worldwidedrillingresource.com



Is Grout Necessary?

by John Christ
J.C.'s Drilling Consultant

When we drill a hole for whatever reason, we create cuttings. So, why do we have to get special equipment and buy yet another product, just so we can fill the annular space? We already have these cuttings we're going to have to do something with anyway. Why can't we use them to fill the annular space?

Let me ask you a question, how long did it take to disrupt and create those cuttings? Well, it took whatever time it took to drill the well! Okay, how long did it take Mother Nature to create the soil that was drilled? I'm not sure, but I assume it was a long time. What does that have to do with it? It has everything to do with it.

It took millions of years, temperature, and pressure to create the ground. We are not going to have the time, temperature, or pressure it took Mother Nature to create what we drilled up. When we fill the annular space with those cuttings, they are going to have porosity. Porosity is the connecting space in between the grains of soil. We will fill up the hole, but as gravity creates the settling of the cuttings, the space between the grains of soil become smaller. The column shrinks and goes down.

So, the next day we come and put more cuttings in there. We may have to do this numerous times. Every time we have to go fix a well is time, and time is money.

Now that we have the annular space full, let's talk about the porosity. Porosity is those connecting spaces, which means something can flow between them. So let's say this happens to be a water well and there is a contaminant spill nearby. It rains and the contaminant now has a carrier to move it. The well happens to be down from the spill and ponds around the casing on the surface. We have those freshly drilled cuttings (even if the well is years old) with the porosity, giving the contaminant an avenue to the water source.

It doesn't matter what type of hole we are drilling. It doesn't matter how we drill the hole. We need to fill the annular space with something which meets or exceeds what was there in the first place. There is no one grout to fit every application. This is why there are so many different grouts available. So anytime you direct push for a soil sample or drill any type of hole, think about sealing it up before you do it. We don't plan to fail, sometimes we fail to plan!

*The statements and comments in this article are based on information and references believed to be true and factual. If you have any questions or comments, please forward them to me in care of **WDR**.*

John

John Christ may be contacted via e-mail to michele@worldwidedrillingresource.com

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Mining Graduates on the Rise

Adapted from Information by the Society for Mining, Metallurgy, and Exploration

The rising number of graduates from U.S. mining and mineral engineering programs was reflected in the recently released 2016 SME Guide to Minerals and Materials Science Schools. According to the guide, there were more than 425 mining engineering degrees of all levels awarded to students graduating from U.S. mining schools in 2015. This incredible news reflects a 20% increase from the previous year's number of 356 graduates and is a far cry from the all-time low of 54 recorded in 2004.

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There are several schools and universities dedicated to help promote mining education, including:

- University of Alaska - Fairbanks - School of Mineral Engineering**
- The University of Arizona - Department of Mining and Geological Engineering**
- Colorado School of Mines - Western Mining Resource Center**
- University of Kentucky - College of Engineering - Department of Mining Engineering**
- Michigan Tech - Mining Engineering Department**
- Missouri University of Science and Technology - Mining Engineering Department (Formerly University of Missouri-Rolla)**
- Montana Tech - The University of Montana - Mining Engineering**
- University of Nevada, Reno - Mining Engineering**
- New Mexico Institute of Mining and Technology**
- The Pennsylvania State University - College of Earth and Mineral Sciences**
- South Dakota School of Mines and Technology - Department of Mining Engineering**
- Southern Illinois University at Carbondale - Department of Mining Engineering**
- The University of Utah - Department of Mining Engineering**
- Virginia Polytechnic Institute and State University - Department of Mining and Minerals Engineering**
- West Virginia University - Mining Extension Service and Department of Mining Engineering**

Mining is one of a handful of sectors projected to add jobs at a fairly constant rate over the next 20 years. Although there is a decline in the number of mining and mineral engineering programs at U.S. colleges and universities, there continues to be a noticeable increase in the number of graduates in those programs. With large numbers of mining professionals reaching retirement age, the industry demand for qualified graduates to enter the workforce has intensified.

Product Spotlight

Most raise boring applications begin with the drilling of a pilot hole, and significant time and cost is associated with pulling pipes out to change bits due to gauge wear. Sandvik's RR880 range of pilot bits have a new design focused on improved gauge protection to increase bit life and productivity. They provide both durability and hole straightness, and up to 35% longer bit life than the predecessor, to substantially reduce the time and cost for changing tools. "With the new Sandvik RR880 pilot bits, you can drill longer between bit changes. Fewer bit changes means shorter project times and increased profit at the end of the day," stated Göran Strand, product line manager, Sandvik Mining.







New Zealand Begins Drilling for Water Use Project

Adapted from Information by the Greater Wellington Regional Council

Exploratory drilling has started at two sites as part of the feasibility study into storing and distributing water in Wairarapa, New Zealand. Geotechnical drilling programs at Black Creek and Tividale will provide core samples as part of an investigation to see if either location would support a potential dam.

Black Creek is located in the Kaituna area west of Masterton, and Tividale is in the Taueru catchment northeast of Masterton. The drilling activity is the latest phase in the Wairarapa Water Use Project, which is investigating how

water could be collected, stored, and distributed to support the sustainable management of the area's land and water, ultimately contributing to regional prosperity.

Project Director Michael Bassett-Foss said the drilling program marked an important milestone in the project's work to secure a more reliable source of water for agricultural, municipal, environmental, recreational, and cultural use in Wairarapa. "After nearly five years of investigations and work with a wide range of community interest groups, it's exciting to be one step closer to meeting our region's ongoing needs and creating wider opportunities for water use," he said.

The two potential plans could irrigate nearly 75,000 acres between Masterton and Greytown, in addition to providing water for a range of other uses. Drilling is expected to take about two months to complete. Other fieldwork would assess the land-based and aquatic ecology of the storage sites and surrounding areas. Mr. Bassett-Foss said the feasibility stage also includes further assessing the potential demand for water and farmer interest in investing in irrigation.

"We will continue to talk with farmers about the opportunities a regional water use scheme will provide and about the various options for ownership and operating structures."

Upcoming activities will include sharing information about land use studies on three local farms to investigate the viability of using irrigation in different situations, and an independent survey of local farmers to understand their preferences for scheme ownership, buying water, and land use. Later this year, an assessment will be made about whether to proceed to the next stage which would see the project move into a new commercial entity to develop and construct the scheme.





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Can Coverage Gaps Trap You?

(From Kyle's seminar at the 2016 Shallow Exploration Drillers Clinic in Catoosa, Oklahoma)
by Kyle Rehme
VolkBell Property & Casualty Insurance, LLC

In a word, YES, but let's start with what exactly is a gap? It's a risk to you personally. Think of it like this: A gap in coverage is the distance between certain coverage in one circumstance and coverage in another. It's anywhere you're unprotected. The bigger the gap, the more things and bigger situations could fall into it - leaving you holding the bag,

footing the bill, or suffering the consequence, and that is the trap!

Kyle Rehme uses his personal knowledge of the water well, drilling, and environmental industries to provide customers with practical insurance solutions.

When it comes to insurance, we like to think about the ways in which we're covered, and we all generally feel better about being protected from the risks and expenses which we either don't want or can't afford. However, insurance isn't designed to protect anyone from every eventuality, in all cases and circumstances, meaning insurance policies have specific limitations and exclusions to be understood and respected. Some policy exclusions are obvious while other exclusions are interwoven into the very language which constitutes the policy itself. Those can be tricky to understand and even more difficult to accept - especially when unwittingly brought about by agents, underwriters, and claims adjusters unfamiliar with the drilling industry, equipment, or terminology as it relates to the insurance you buy. Ignorance might be bliss, but it is one of the most common gaps and most costly traps of all!

This is especially true of the traps lurking just outside of an insurance policy. Most devastating of all are those for which not only is there no insurance coverage, but for which you could be in for a legal battle and ultimately on the hook for punitive damages. While there are more than enough traps out there to fill a book, perhaps one of the most pervasive and dangerous ones has to do with autos. Here is a firsthand example of what happened to a client just BEFORE we met:

An employer purchased a new truck, had his agent add it to his policy, then sent an employee to drive it. Unfortunately, the new employee caused a catastrophic accident with a fatality. This was truly a bad day for everyone, but it was made worse because the employee had a three-year-old DUI (Driving Under the Influence) on his record. Making issues even worse, the vehicle was titled personally and not to the business, and was added to a personal policy with low liability limits, not the commercial policy. Things went downhill from there until the business owners finally had to personally settle without insurance for several hundred thousand dollars! A personal hit paid out of their pocket.

I encourage you to drill down into the details of your insurance program. Raise your awareness; think and act with clarity, as well as wisdom, to secure your future and success - come what may.

I encourage you to drill down into the details of your insurance program. Raise your awareness; think and act with clarity, as well as wisdom, to secure your future and success - come what may.

Kyle

Kyle Rehme may be contacted via e-mail to michele@worldwidedrillingresource.com

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New Borehole Inspection System on Display at JUBILEE

Adapted from a Press Release by Aries Industries, Inc.

Visitors to the Aries booth at the South Atlantic JUBILEE will be able to see the updated Explorer Borehole Inspection System. This completely integrated, mobile unit is easily set-up by one operator for quick evaluation of wells.



The compact Explorer, with its user-friendly interface, helps identify problems before they become more serious and operates at depths to 1200 feet in 2- to 12-inch diameter boreholes.

The dual view camera with 360° rotation provides downhole and side view video profiling. An automatic level wind ensures faster, uniform camera retrieval.

All components, including the control unit, are mounted on a compact cart. The unit features a wireless keyboard and integrated overlay for video titling. An integrated DVR records to a USB flash drive. Manual focus and iris adjustment provide clear images in difficult lighting conditions.

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Ronnie's Real World



Thinking and planning are part of my everyday life, as I'm sure it is yours, whether or not you realize it. Every step you take, and move you make, is because YOU thought about it and were thinking about doing something. Right?

And so, there I was thinking. I was wondering just how important is experience? What is its true value? Do you believe experienced people have a profound effect on your business success?

Here are my thoughts - as usual - probably unsolicited, but here they are anyway:

If you take a person who has worked in your industry for say 50 years. During those 50 years, that person has gained knowledge that cannot be put into a book form.

Knowledge cannot be obtained overnight. You cannot sit next to that person for a short period of time and expect that knowledge to somehow go directly into your brain cells and voilà, you become experienced.

Won't happen! Not a chance! Now consider the effect on your company if you decide to let that person of 50 years with all that experience and knowledge go, and replace him with a younger person. So maybe, just maybe, you feel the younger person will bring new insight and vision to your company and increase its bottom line -- overnight.

Won't happen! Not a chance! What you will have and what I have seen during this past year with so many companies doing just that, is their bottom line falters. Your prior long-time, good customers, who pay regularly, whose relationship with your now unemployed 50-year plus employee, decides they have no loyalty left for you since you obviously didn't have any loyalty for that lifelong friend of theirs. This was the man they trusted to provide the goods and services they really needed and not just some "salesman" or "no-knowledge serviceman" who just wants to make a sale - needed or not by your longtime customer.

This experience, knowledge, and lifelong working relationship between you and your customers doesn't just happen because the name on the door is the same. It is cultivated over years until it blossoms into something you can be proud of.

So, before you consider the "older person" is no longer needed, give it a second thought. They might just be your teacher for the younger, nonexperienced person. Of course this teaching process requires a student who is eager to learn and willing to listen. Good luck with that.

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Through the Front Door!

by Jim Kuebelbeck

Dynamite Fishing Part 2

When we arrived at the creek, we parked the car some distance away. (Not quite far enough, I thought, because I had watched Dad dynamite out ditches in the meadow before, and remembered how high and far some of the rocks flew!) At any rate, I helped John tape the sticks of dynamite together (so that's what the tape was for). We then weighted the whole thing down by taping some small rocks to the "bait".

Making a small hole the size of a pencil into one of the sticks, John carefully inserted a blasting cap (just like we had seen Dad do many times). Sliding a length of fuse cord about a foot long into the blasting cap and securing it tightly with tape, we were then ready "to go fishing". We went over to the creek edge and John lit the fuse. Wow! I didn't realize how brightly those magnesium fuse cords burned, because Dad had never allowed me to be anywhere near when he lit them.

With the fuse cord hissing and throwing sparks everywhere, John tossed it into the deepest part of the creek, and we ran back to take cover behind the car. Just as we crouched down behind the car, we heard a vehicle rumbling down the field road toward us. It didn't take us long to recognize Dad's other car. He had come home and my mother told him what we were up to. Coming to a screeching halt in a cloud of dust, he jumped out of the car and yelled, "What the h--I are you doing? How much dynamite did you use? How long a fuse did you use?"

"Three sticks," my brother answered.

"Three sticks!" he yelled. "Why did you use three sticks?"

"Because that's all we could find," John replied.

Dad started to say something else, but was interrupted in mid sentence by the most horrendous "BA-WOOM" soon followed by mud, water, sticks and other debris raining down from the sky. Crouching down behind the old car, we waited for the "rain" to stop. The uncomfortable silence that followed was finally broken when Dad said, "Well, we might as well go over and take a look at your stupidity." What we saw, however, was not what we had envisioned. The surface of the water was covered with thousands of the tiniest unidentifiable pieces of litter we had ever seen. There were probably some fish parts somewhere, but it would have taken today's DNA technology to confirm that possibility!

Without saying another word, Dad went back to his car and headed for home. John and I decided it might be best if we allowed Dad a short cooling off period before following him home (which was probably wise). I vividly remember the ride home, however, with John repeating over and over, "Jim, wasn't that the greatest fun ever?"

I thought it was, but somewhere in the back of my mind I was beginning to have some second thoughts about this particular fishing excursion. There was a growing feeling in my mind that I'd have to do some serious explaining to my dad in the near future.

Suffice it to say, I learned two lessons that day. The first lesson was I had better never again show anyone where Dad stored any dynamite. The second lesson was: "An angler should never use all of his bait on the first cast!"

The statements and comments in this article are based on information and references believed to be true and factual. If you have any questions or comments, please forward them to me in care of WWD.R.

Jim

Jim Kuebelbeck may be contacted via e-mail to michele@worldwidedrillingresource.com

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Drilling Into Money Not Boring

by Mark E. Battersby

New and Expensive Lease Accounting Rules

Today, few leases get recorded on a drilling operation's books. If an obligation is not recorded on a balance sheet, it makes the business appear less leveraged than it really is. However, this is all changing - and not for the good.

Thanks to negotiations between the International Accounting Standards Board which sets rules for many countries around the globe, and the U.S. Financial Accounting Standards Board which writes the rules in the United States, the lease accounting rules as we currently know them are changing. The new rules will soon require many businesses to add all but the shortest leases to their balance sheets as liabilities, much like debt, affecting the way potential lenders, investors, and suppliers view the drilling operation.

The new guidance is not expected to prevent any drilling contractor, supplier, or distributor from acquiring the equipment and business assets necessary to grow their operations. In fact, there are many reasons to lease equipment, and the primary factors will remain intact under the new rules - from maintaining cash flow to preserving capital, to obtaining flexible financial solutions to avoiding obsolescence.

Publicly traded companies will be required to adopt the new standard for fiscal years beginning after December 15, 2018. For calendar year-end public companies, this means an adoption date of January 1, 2019, and retroactive application to previously issued annual and interim financial statements for 2017 and 2018.

Nonpublic companies, such as most privately-owned drilling operations and businesses, will be required to apply the new leasing standard for fiscal years beginning after December 15, 2019. Thus, for most drilling businesses this means an adoption date of January 1, 2020, and retroactive application to previously issued annual financial statements for 2018 and 2019.

Although these effective dates might seem like they are quite far away, every business should begin preparing for the new lease accounting requirements now. After all, with many drilling operations involved with a number of leases - and lessors - the long adoption period can mean fewer surprises with existing leases.

Although taxes play a role in whether to lease or purchase, they should not be the deciding factor. Will the new accounting guidelines and the accompanying impact on the operation's financial status come as a surprise? Most importantly, when should your drilling operation or business begin playing under the new rules?

Mark

Mark E. Battersby may be contacted via e-mail to michele@worldwidedrillingresource.com

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MINING IN THE USA PART 32:

WISCONSIN

Compiled by Amy White, Associate Editor

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Wisconsin's New London Quarry has been in continuous operation for over 75 years, mining limestone, dolomite, and industrial sand.

Mining has always been an important part of Wisconsin's way of life. Even the state's nickname, The Badger State, pays homage to its mining past.

Metallic mining has taken place in Wisconsin since the time of the Old Copper Culture about 2000-5000 years ago. The Old Copper Culture refers to the dense concentrations of recovered copper items made by early inhabitants of the Great Lakes region, such as ancient axes, knives, and fishhooks found in eastern parts of the state.

The earliest recording of copper exploration by European settlers in northwestern Wisconsin occurred from 1845-47 below Big Manitowish Falls and in the Copper Creek section of what is now Pattison State Park.

Prospectors opened crude holes in the rock, but their lack of mining skills, along with transportation problems and limited success, led them to eventually abandon the endeavor. Interest returned in the Civil War, with the growing demand for copper. "Copper fever" hit Wisconsin, and experienced miners from Michigan came to the state in great numbers. After the war, copper prices fell, and mining came to a halt. High copper prices renewed interest in the state's copper at the turn of the century, though deposits have not yet proved to be of sufficient value to make mining successful.

Places in southwest Wisconsin with names like Mineral Point and New Diggings recall an earlier time when local mines produced a large portion of lead for the U.S. In the early nineteenth century, lead mining was more promising and attractive than the fur trade and farming. The potential for quick rewards brought over 4000 miners to southwest Wisconsin by 1829, where they produced more than 13 million pounds of lead annually. Miners had little time to construct shelters, and some simply burrowed holes into hillsides, earning them the nickname "Badgers".

Lead mining in Wisconsin peaked in the 1840s. The state's mines yielded over half the national output, but demand for lead began to decline once the easily accessible ore was exhausted. Many miners moved on in hopes of finding fortunes in gold out west. Those who remained often supplemented farming with mining on the side.

Iron mining took place for more than 150 years in Wisconsin. Iron mines were operating in Dodge and Sauk counties by the mid-1800s. By the turn of the century, iron was also being mined in Jackson, Florence, Marinette, Iron, and Ashland counties. Much of this early iron mining occurred in small, underground mines and the legacy is still a major contributor to the cultural identity of these areas to this day. The last operating iron mine in Wisconsin was the Jackson County Iron Company Mine, which ceased operations in 1982, and has since been reclaimed as the Wazee Lake County Park. From time to time, Wisconsin's iron reserves still attract interest from industries, though no iron mines are currently active.

Today, most mining in Wisconsin occurs as nonmetallic mining, producing rock, stone, sand, gravel, limestone, and other materials used for industry, construction, road building, agriculture, as well as many other purposes.

Prized for their uniform grain size and high silica content, the state's abundant sandstone resources have been mined for over a century. Wisconsin sand is used for glass manufacturing, foundry molds, and golf course traps. It has been mined for use

in the petroleum industry for many years as well, especially with advances in extracting oil and gas through hydraulic fracturing. Sand for the oil and gas industry is currently being mined from sandstone formations in western and central portions of the state. The current slump in oil and gas production has definitely taken a toll on Wisconsin's sand mining operations, but industry experts like Rich Budinger, a spokesperson for the Wisconsin Industrial Sand Association, are optimistic demand will rise again when oil prices inevitably go back up.

Extraction of marketable minerals has always been a valued industry in Wisconsin, and mining in the Badger State is likely to remain a significant contributor to the economy for years to come.

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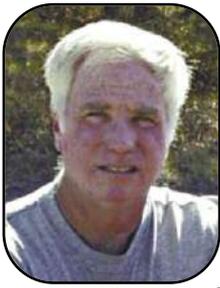
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Mirror, Mirror on the Wall ~ Who's the Cheapest of Them All?

by Britt Storkson
Owner, P2FlowLLC

My vote for the cheapest products goes to the semiconductor industry. We complain of cheap cars, cheap (low-quality) food, cheap houses, and the like while paying relatively high prices for these items. I believe the semiconductor industry has them all beat. Using modern technology and manufacturing methods, semiconductor (computer) products are incredibly cheap to make in quantity (1000+). It's the main reason they're used almost everywhere.

Suppose you want to make a "one-shot" timer. What it means is, when you press a switch the device will turn on for a given amount of time, and then turn off until you press the button again. These are useful for things like lights where you don't want to walk off and forget you left it on. You want it to stop at some point.

A microprocessor capable of doing this can be purchased for less than \$1. A power supply that takes the 110-volt AC (alternating current) and turns into a low-voltage DC (direct current) can be bought for about \$1. If you're using 12-volt automotive battery voltages, you don't even need it. For the printed circuit board to put it all on, a few needed resistors and capacitors, plus parts assembly, you can add another \$1.00 to \$1.50.

Adding switch buttons on the inputs and relays on the output to switch the higher power and voltage will set you back another \$2.00 to \$5.00 depending on the quality and power rating. With semiconductors, like almost everything else, you get what you pay for and there are many choices available. Also, making four or eight of these "one-shot" timers would cost only slightly more. And the microprocessor can handle other tasks, as well.

So why are electronic devices so much more expensive?

1. Enclosures. Often, the box to put the electronics in costs more than the electronics. Well-designed and attractive enclosures often generate more sales. Rugged enclosures, such as cast aluminum, are needed for tough environments, such as automotive and outdoor applications.

2. Certifications/Listings/Legal/Liability. Unfortunately, this is getting to be a larger percentage of the purchase price, which the manufacturer must pass on to the consumer. If you add up what you pay just for insurance every year, you will know what I mean.

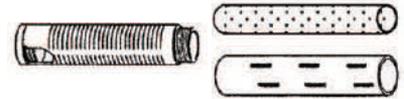
"Cheap" doesn't necessarily mean inferior or low quality. "Value" is what we get for what we pay and, again, I believe the semiconductor industry takes the lead here. Often adding well-designed computer controls results in a much better product at ultimately, a much lower price. One example of this is the variable frequency drive (VFD). The VFD eliminates pump panels, motor starters, phase converters and soft starts, and pressure-regulating valves. With deep well pumping applications using single-phase power, often the addition of a VFD will more than pay for the smaller wire sizes required for a given horsepower motor. In other words, the silicon and "smarts" are cheaper than the additional copper needed to service this motor. Add to it the fact it's nearly impossible to "kill" a motor operated from VFD because of the high degree of monitoring, it does make the VFD a great value for just about every motor installation.

So while I may be "cheap", I look for value - and computer technology certainly has delivered in that department.



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The "Idiots" Corner

by "Billy Bob Smith"

"We are all born ignorant, but one must work hard to remain stupid."

~Benjamin Franklin

Warning Labels

Have you ever read some of the warning labels on products recently? Beware - some of this stuff is really, really stupid (and these are all real - trust me)!

Caution: The contents of this bottle should not be fed to fish. On a bottle of shampoo for dogs.
Do not use in shower. On a hair dryer.

Do not use while sleeping or unconscious. On a handheld massaging device.

Recycled flush water unsafe for drinking. On a toilet at a public sports facility in Ann Arbor, Michigan.

This product not intended for use as a dental drill. On an electric rotary tool.

Caution: Do not spray in eyes. On a container of underarm deodorant.

Caution: This is not a safety protective device. On a plastic toy helmet used as a container for popcorn.

Do not eat toner. On a toner cartridge for a laser printer.

Not intended for highway use. On a 13-inch wheel on a wheelbarrow.

Eating rocks may lead to broken teeth. On a novelty rock garden set.

Caution: Shoots rubber bands. On a product called "Rubber Band Shooter."

Do not use orally. On a toilet bowl cleaning brush.

Please keep out of reach of children. On a butcher knife.

Warning: Do not use on eyes. In the manual for a heated seat cushion.

Do not use for drying pets. In the manual for a microwave oven.

For use by trained personnel only. On a can of air freshener.

Remember, objects in the mirror are actually behind you. On a motorcycle helmet-mounted rearview mirror.

Warning: Do not climb inside this bag and zip it up. Doing so will cause injury and death. A label inside a protective bag (for fragile objects), which measures 15 x 15 x 12 centimeters.

Do not use as ear plugs. On a package of silly putty.

Warning: Knives are sharp! On the packaging of a sharpening stone.

Theft of this container is a crime. On a milk crate.

Do not use intimately. On a tube of deodorant.

Warning: Has been found to cause cancer in laboratory mice. On a box of rat poison.

Cannot be made nonpoisonous. On the back of a can of deicing windshield fluid.

Caution: Remove infant before folding for storage. On a portable stroller.

Do not drive car or operate machinery. On children's cough medicine.

For indoor or outdoor use only. On a string of Christmas lights.

Wearing of this garment does not enable you to fly. On a child-size Superman costume.

Beware! To touch these wires is in-stant death. Anyone found doing so will be prosecuted. On a sign at a railroad station.

Do not light in face. Do not expose to flame. On a lighter.

Not for human consumption. On a package of dice.

May be harmful if swallowed. On a shipment of hammers.

Need I say more?!

Billy Bob

Do you want to submit something for The "Idiots" Corner?

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Sandvik Remains at the Forefront of Safety

Adapted from a News Release by Sandvik Construction



EN 16228 has led to major safety related changes to the modern drill rig.

New EN (European Standards) safety standards have led manufacturers to take a closer look at their drilling rigs, to ensure operational safety is improved. One of the major improvements in the standard is the revised requirement to better protect operators and other personnel from the entanglement hazard caused by the rotating drill steel.

Sandvik's solution was to develop and install a safety cage around the feed beam. New requirements are also in place to reduce the risk of fire associated with hose leakages. Protective sleeves have been fitted over hydraulic hoses in coolers and the power pack. These are just two examples of how Sandvik has, through its proactive collaboration and membership of the safety standards committee, been at the forefront of improving product safety, and vitally, ensured all Sandvik drilling products meet the new standards on the day they became operational.

Sandvik Construction drill rigs are internationally known for being leaders in technical safety. Fulfilling the requirements of any new safety standard is a challenging experience; however, for Sandvik Construction there are also many benefits. "Product standards are very important to us. From Sandvik's point of view, it is a definitive benefit to be able to bring high-quality products that comply with the requirements to all market areas. With the help of safety standards, we are able to show the safety level of our drill rigs," said Päivi Kautiainen who is responsible for the general development of drill rig safety at Sandvik.

"Naturally, we pursue development for competitive advantage in the market, of which safety is one of the most important ones. We focus on improving safety all the time," said Jarno Viitaniemi, product manager for surface drill rigs. "In addition, our 3-D hole navigation system, together with the drilling pattern design program, significantly improves safety and productivity of the drilling-blasting process. In developing drill rigs, we constantly pay attention to machinery and functional safety, which in turn helps our customers to improve their own safety at work. Nowadays, the customer is able to choose such items, such as remote-controlled drill rigs, dust sealing compound systems, and noise protective systems, as our customers are increasingly seeing the benefits of professional safety design and safety solutions."

According to Jarno, these new safety features are important, no matter where the equipment operates. "Though this is an EN standard, we have a lot of customers in various markets who want drill rigs that are built according to EN standards, and therefore possess high-quality safety solutions, even if their local legislation does not require them."

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World's First 3-D Printed Excavator on Display at CONEXPO-CON/AGG

Adapted from a News Release from the Association of Equipment Manufacturers

CONEXPO-CON/AGG 2017 will feature the unveiling of the world's first fully-functional 3-D printed construction excavator, and the first large-scale use of steel in 3-D printing, known as additive manufacturing.

The excavator, which will be on display March 7-11, 2017 in Las Vegas, Nevada, will bring to life how technology is transforming the construction industry in line with the 2017 theme, *Imagine What's Next*. In addition to the preprinted excavator, attendees will see a second excavator printing live on the show floor.

"We know our members look forward to seeing the industry's most innovative technologies at CONEXPO-CON/AGG...each show year, and 2017 will not disappoint. We're thrilled to bring such a significant technological and first-of-its-kind achievement like the 3-D printed excavator to the show; it will be a platform to demonstrate how the latest innovations and applied technologies are changing the future of construction industry," said John Rozum, show director.

The excavator is a joint collaboration between the Association of Equipment Manufacturers (AEM), National Fluid Power Association (NFPA), Center for Compact and Efficient Fluid Power (CCEFP), Oak Ridge National Laboratory (ORNL), and the National Science Foundation (NSF).

The group is working with research teams from Georgia Tech and The University of Minnesota to convert the current excavator design to one that takes full advantage of 3-D manufacturing. Graduate engineering students at Georgia Tech will be creating a boom and bucket, featuring integrated hydraulics with the goal of decreasing the weight, materials cost, and maintenance; students at the University of Minnesota are designing a hydraulic oil reservoir/heat exchanger and cooling system which will reduce the size and weight, in addition to increasing the efficiency of the machine.

"Technology and innovation will drive change for the future of the construction industry, and we're excited that students are playing a vital role in bringing the newly designed machine to life," said Eric Lanke, chief executive officer of NFPA.

In addition to the partnerships with the Georgia Tech and the University of Minnesota, AEM, NFPA, CCEFP, ORNL, and NSF are inviting undergraduate engineering students from across the country to participate in a nationwide contest to design and print a futuristic cab and a human-machine interface for the excavator which is both aesthetically pleasing and functional.

Students can submit designs for the cab of the excavator on the Center for Compact and Efficient Fluid Power website (www.ccefp.org). All entries will be judged by a panel of industry experts with the winning team receiving a \$2000 cash prize and the opportunity to visit the Oak Ridge National Laboratory in Tennessee to observe the printing of the selected design.

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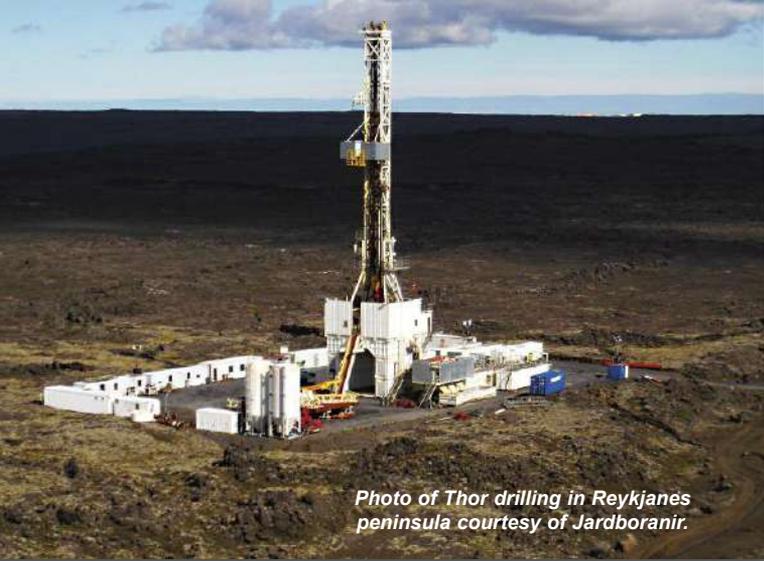


Photo of Thor drilling in Reykjanes peninsula courtesy of Jarðboranir.

Iceland Prepares to Drill its Deepest Geothermal Well

Adapted from Information by HS Orka

Iceland-based HS Orka and Jarðboranir have signed a contract for the drilling of a 16,400-foot, high-temperature well at the Reykjanes geothermal field. Jarðboranir's largest drilling rig, Thor will be used for the project. The well is intended to be the country's deepest and hottest geothermal well, with temperatures up to 930°F (500°C).

HS Orka's existing 8200-foot well at Reykjanes (well 15) will be deepened to around 16,400 feet later this year. The contract is part of the next step of the Icelandic Deep Drilling

Project (IDDP) to demonstrate the possibility of harnessing deep hydrothermal high-enthalpy reservoirs to augment the current conventional geothermal fields. If the chemistry of the superheated steam can be dealt with, the well will be used directly for power production, potentially increasing the output of the Reykjanes plant. If not, the well may be used as an injection well, increasing the output of the existing shallower production wells. New technology will be introduced for the drilling, testing, and harnessing the deep well, in collaboration with domestic and international partners.

The Reykjanes peninsula has been called a geothermal wonder with numerous high-temperature geothermal areas capable of producing power. Currently, the Reykjanes plant, which began production more than a decade ago, produces 100 megawatts of geothermal energy.

HS Orka manages the project in cooperation with Statoil in Norway and the partners inside the IDDP consortium. The IDDP project was recently awarded a research grant from the European Union research program "Horizon 2020", and is led by HS Orka in cooperation with Isor, Landsvirkjun, Georg, Statoil, among other European companies.

THE IDDP project has been ongoing the last 15 years. The consortium consists of the Icelandic power companies HS Orka, Landsvirkjun, Orkuveita Reykjavíkur together with the National Energy Authority and Statoil.

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The Last of Flares?

Adapted from Information by NewsWire Today



North Dakota state regulations will require oil and gas companies to significantly reduce flares over the next several years or face steep penalties and potential curtailment of oil production for wells not meeting reduction requirements.

Environmentally Friendly Drilling Systems (EFD), Gulf Coast Green Energy, and ElectraTherm, partnered with the HESS Corporation to test the ElectraTherm Power+ Generator™, a waste-

heat-to-power technology, at a North Dakota oil well in an attempt to reduce oil and gas flaring. The project captures the natural gas which would otherwise be flared, and uses it to generate electricity, reducing or eliminating onsite flaring.

Funding for the project came from the Research Partnership to Secure Energy for America program and the Houston Advanced Research Center's Environmentally Friendly Drilling Program. The project's goal is to demonstrate the Power+ Generator as an effective means of reducing flared gas.

Texas A&M University's Agrilife Research Institute of Renewable Natural Resources is conducting emission monitoring, and comparing emissions from direct flaring versus the Power+ solution.

The Power+ Generator applies Organic Rankine Cycle (ORC) and proprietary technologies to generate power from low-temperature heat ranging from 170-252°F (77-122 °C). At the oil well, natural gas, which would otherwise be flared, is used instead to fuel a low-emission industrial boiler. The boiler heats water to run the Power+ Generator, and produces energy which can be used for on-site processes, offsetting the cost of electricity from the grid or diesel generators.

EFD is encouraged about the preliminary results of the demonstration. According to Dr. Rich Haut, Director of EFD, "Projects like this allow us to evaluate new technologies for the [oil and gas] industry, and to find science-based solutions to industry challenges, which is our primary mission."



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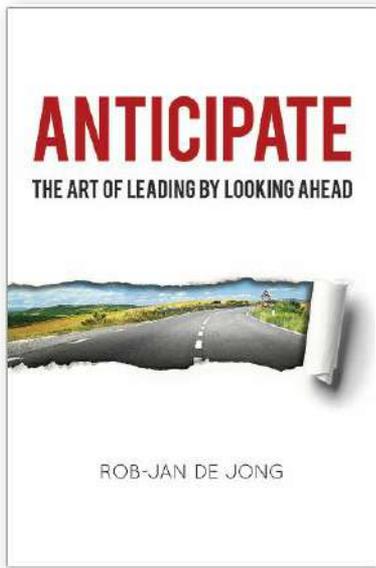
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The Four Faces of Leadership

Adapted from Information by News and Experts

Whether it's a presidential candidate, drill rig manager, or company CEO, people admire a leader with vision; someone with a clear idea of where they are headed and knows how to motivate others to accomplish the goal.

As much as people might like to say someone is a born visionary, the truth is vision is something we develop, not something we are born with, according to Rob-Jan de Jong, a behavioral strategist and author of *Anticipate: The Art of Leading By Looking Ahead*. "One thing that visionaries have in common is that they have an ability to notice things early. They recognize some sort of significant change is

happening and they make use of the opportunities it presents," he said.

Just identifying a major change is afoot isn't enough; the visionary needs to connect the dots into a coherent picture which takes into account future developments.

Growing a leader's visionary side boils down to sharpening both the ability to notice things early and the ability to create coherence. In combination, the abilities suggest four archetypes of leaders.

The Follower - This is someone who is neither good at noticing things early, nor skilled at creating and communicating a coherent story from insights about what the future might bring. The follower may be an excellent manager, but don't expect this person to inspire others or drive innovation. "Being a follower isn't necessarily a bad thing," de Jong remarked. "These people are often careful about their decisions and good at critical thinking, and in the short term that can work well. But their preoccupation with today keeps them from anticipating what comes next."

The Trend Hopper - On the upside, a trend hopper has a well-developed ability to see things early and is willing to embrace changing realities. These are people who are quick to adopt new technology and among the first to fantasize about how things can be different - even radically different - real soon. On the downside, trend hoppers aren't adept at turning their early insights into a coherent story justifying an active strategic pursuit. After seeing them chase several flavor-of-the-month ideas, other people start to tune them out.

The Historian - These leaders are adept at connecting the dots and spinning a story that makes sense. They cite patterns, facts, and figures and make everything that's happened so far look coherent and intentional. "When you listen to them, it all makes sense," de Jong explained. "But they have their eyes trained on the factually true past, not the imaginative uncertain future." Certainly, it's valuable to have some historical perspective, but you can't let history cripple your ability to engage the future. Historians are also often cynics, ready to explain why things are they way they are and why an unconventional idea won't work.

The Visionary - This is the one to strive to be. A visionary isn't quick to hop on every fad, but also isn't a naysayer about how things might be done differently. Instead, the visionary takes a mindful, future-oriented perspective, balancing the need for a compelling future with the awareness of the dangers of becoming dogmatic and overly optimistic. Visionaries are able to explain an imagined future in a way that fills people with energy and engages their imagination. "A powerful vision isn't just nice to have," de Jong said. "It's the most important tool in the transformational leader's toolbox. A leader's personal imagination, inspiration, and dedication are what will ignite the excitement in the people they lead."

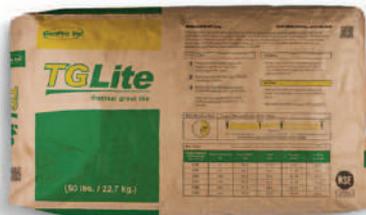
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AIRSHIPS AND THE FUTURE OF EXPLORATION

Compiled by Amy White
Associate Editor
WorldWide Drilling Resource®

As rich, easily-reachable deposits decrease, mining and exploration is expected to push even farther into isolated areas. The vision of giant airships as long as football fields delivering workers and equipment to remote sites is closer to reality than ever before.

Cost-conscious oil and gas companies are currently eyeing innovative new aircraft designs which could potentially carry workers and cargo to the world's most remote locations. Companies are hopeful the aircraft could eliminate the need for hefty infrastructure investments to build roads and runways for access to otherwise inaccessible places.

Straightline Aviation, the world's largest airship company, signed a letter of intent to purchase up to 12 Lockheed Martin Hybrid Airships with a potential value of approximately \$480 million. Straightline Aviation is working with Hybrid Enterprises, Lockheed Martin's Hybrid Airship reseller, to finalize the purchase agreement.

"We are delighted to be first in line with this magnificent aircraft that is going to dramatically change the way cargo is moved around the world," said Mike Kendrick, Straightline Aviation cofounder and chief executive officer. "The clear-cut economic and environmental advantages of these Hybrids are attracting vast amounts of attention from a wide-range of potential end users."



Photo courtesy of Lockheed Martin.

With its unique, tri-lobe shape and air cushion landing system, the Hybrid Airship, called the LMH-1, promises to affordably transport cargo and passengers while requiring little or no fixed ground infrastructure and burning significantly less fuel compared to conventional aircraft. The LMH-1 will be able to carry 47,000 pounds of cargo, along with 19 passengers. Buoyed by nonflammable helium, it will measure 300 feet long, and nearly 80 feet high. Four external, 300-horsepower diesel engines rotate to move the craft forward, back, up, and down.

Straightline should start receiving the airships in 2018, with the final ones to arrive by 2021. The company expects its first airship customers to come from the exploration industry. Kendrick said potential customers are already showing interest as major oil and gas and mining companies look for ways to reinvent their businesses in a changing economy.

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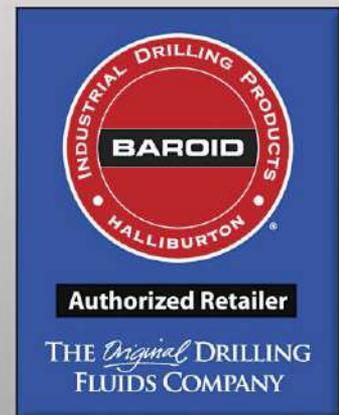
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Iran's Crude Exports are Breaking Records

Adapted from Information by Genscape, Inc.

Iran's crude exports have increased in line with the country's expectations, when economic sanctions related to its nuclear program ended in January. Destinations for Iranian crude exports have also diversified as the country tries to regain market share.

Total Iranian waterborne exports have gradually increased, reaching a record 45.8 million bpd (barrels per day) in February 2016, according to Genscape's monitoring of crude shipments from the Middle East Gulf.

Total Iranian waterborne exports in January 2016 increased month-on-month by 0.26 million bpd and February saw another increase of 0.22 million bpd, reaching an average of about 1.58 million bpd.

This corresponds with Iranian officials' announcement when sanctions ended to ramp up crude exports by around 0.5 million bpd. According to Roknoddin Javadi, the managing director of NIOC (National Iranian Oil Company), Iran has reached 1.8 million bpd of production.



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Iran is also seeking to diversify its crude buyers by gaining back market share lost in Europe after sanctions began. Since mid-January, European oil companies Cepsa, Total, and Lukoil have completed deals to buy Iranian crude, while four tankers with Iranian crude have headed to refineries in Algeiras, Spain; Le Havre, France; and Constanta, Romania.

Genscape monitors Middle East Crude exports daily using its Genscape Vesseltracker data with market intelligence sources to identify

Using Genscape Vesseltracker data, the *Middle East Waterborne Crude Report* illuminates the flows coming out of the Middle East producing countries so traders and analysts can better gauge markets in Asia, Europe, and the Americas.

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(To Marcel, referring to *WorldWide's* verification process...)

[Re: Your ad for June]

Wow. Good catch. Everyone missed that here. (Little-known fact, those numbers spell "WIRE".)

Revised ad attached. Thanks so much!

Dyann Simile
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German University Studies GSHP Cost Reduction

Adapted from a Press Release by Friedrich-Alexander-Universität

Geologists at one of the largest universities in Germany, FAU (Friedrich-Alexander-Universität) are studying how to reduce construction and operation costs of geothermal systems. As part of a four-year international project, they are working with 15 European partners to test new drilling technologies to improve geothermal systems. The EU (European Union) has provided funding for the research aimed at making sure geothermal energy remains a marketable alternative source of heat energy for private households.

Making use of geothermal energy is not a new concept - the Romans used hot springs in their baths back in Antiquity (the period before the Middle Ages). Since then, the technology for using geothermal energy has advanced significantly. Using ground source heat pumps (GSHP) and drilled wells, modern homes can be heated and cooled using clean, renewable geothermal energy.

Dr. David Bertermann and Johannes Müller from Geozentrum Nordbayern at FAU are now investigating how the construction and operating costs of these shallow geothermal systems can be reduced. "One of the ways in which we would like to reduce costs is by developing new drilling technologies. Our task is to stay above a depth of [160 feet], which would reduce the costs considerably," said Dr. Bertermann, who is responsible for the part of the project focused on developing probe and drilling technologies.

Soil conditions are another crucial factor influencing the cost of installation and how efficiently a system operates. In light of this, researchers are collecting data on soil conditions for the EU-funded Cheap-GSHP project. This includes information on the drillability and conductivity of the soil, both of which vary greatly depending on the type of rock. Higher drillability means it is easier and less expensive to drill the required boreholes. The depth of the holes depends on the conductivity of the soil - higher conductivity means a shallower depth is required. This data, collected from all over Europe, will be compiled in a map and made publicly available.



Dr. David Bertermann

FAU researchers will test new drilling technologies, as well as modified heat exchange systems in Eltersdorf near Erlangen to determine whether they are able to reduce the costs and increase the productivity of geothermal systems as planned.

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Frequently-Used Geological Terms Part 51

Glossary Adapted from the Dictionary of Geological Terms

M

Microlitic - The texture of a porphyritic igneous rock in which the groundmass is composed of an aggregate of differently oriented or parallel microlites in glassy or cryptocrystalline interstitial material (material within a fissure).

Microlog - A well log designed to measure the resistivity of a small volume of rock next to the borehole. Response is dominated by the presence of drilling mud caked on the walls of the hole, which causes separation between curves indicating porous zones.

Micrometeorite - A meteorite particle so small it can pass through the earth's atmosphere without vaporizing or becoming intensely heated.

Microperthite - A fine grained intergrowth of potassic and sodic feldspar in which the lamellar structure is only visible with the aid of a microscope.

Microphyric - Said of the texture of a porphyritic igneous rock in which the phenocrysts are microscopic. Also used to refer to a rock with such texture.

Migma - Mobile, or potentially mobile, mixture of solid rock material and magma, the magma having been injected into or melted out of the rock material.

Migmatite - A rock composed of igneous, or igneous appearing, and/or metamorphic materials, which can be seen with the naked eye.

Migration - The movement of oil and gas from their source beds through permeable formations into reservoir rocks.

Miller Indices - A set of three or four symbols used to define the orientation of a crystal face or internal crystal plane. The indices are determined by expressing, in terms of lattice constants, the reciprocals of the intercepts of the face, or place on the three crystallographic axes, and reducing if necessary, to the lowest integers retaining the same ratio.

Milling Ore - An ore which needs preliminary treatment before it is acceptable for shipment or market.

Mine - An underground excavation for the extraction of mineral deposits. The term is also used to describe aboveground open-pit workings. The area/property of a mineral deposit being excavated. To excavate and extract mineral deposits.



WWR photo of the Kennecott open-pit mine in Utah.

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The Spafford & Sons of Williston, Vermont duo celebrated with the GEFCO, Inc. Team on their recent purchase from the GEFCO / Astec Industries facility in Enid, Oklahoma.

DRILLMAX, Inc.



Bryan from Gregor Well Drilling of Hampton Bays, New York, was very pleased to show his fourth new rig from Donnie of DRILLMAX, Inc. of Ocala, Florida.

Schramm, Inc.



Schramm's Ryan, Tyler, and Jeff with Jeff from Smith Well Drilling of Niverville, New York, were proud of their rig from Schramm of West Chester, Pennsylvania.

Pulstar Mfg.



Barry of Pulstar Mfg. / Preferred Pump and Equipment of Dodge, Nebraska, with Darell and Geoff of Quackenbush Water Systems of Warwick, New York, who were happy to display their new pump hoist.

Northeast Drill Supply



The team from Comac Pump & Well of Kingston, New Hampshire, was delighted to show their new REICHdrill from Northeast Drill Supply of Greenville, New Hampshire.

Amthor Welding

Joey of Amthor Welding of Gardiner, New York, helped the Turnbull's (Callie & JB pictured) celebrate the latest addition to the Turnbull Well Drilling fleet from Warwick, New York. To celebrate over 30 years as a family-owned and -operated business, their names were painted on the door: Sandy (daughter), Rusty (son), JB (son), Kailee (granddaughter), Kathy (wife), John (owner), Callie (granddaughter), and Ethan (grandson).



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Don with Colaluze Well & Pump of New Village, New Jersey, was eager to use his new Hunke pump hoist mounted on a Ford F-550 from Morris Industries, Inc. of Pompton Plains, New Jersey.

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Marty of Pulstar Mfg. / Preferred Pump and Equipment of Dodge, Nebraska, was pleased to stand with Randy of Fisher Supply of Canby, Oregon, and show off the new pump hoist.

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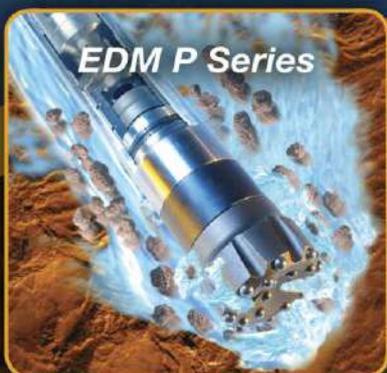
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Environmental Monitoring

by Thomas Kwader, Ph.D., P.G.



Let's be Open to New Ideas in the Drilling Industry

Last year while attending a large groundwater convention and trade show, I had the opportunity to talk to some younger "sons" of family-owned drilling businesses. I was surprised to learn there was some frustration that the fathers were still in control of their businesses and were not open to "new ideas or methods" of drilling wells. Basically, the wells were drilled pretty much the same way for the last 20 or more years. In some cases, the young drilling contractors were not sure they wanted to follow in their father's footsteps.

I personally have seen many significant, positive changes in the way wells are now drilled. When I started as a field inspector with the State (Florida) in the mid-1970s, we basically had two types of drilling rigs for four-inch domestic wells in North Florida - rotary and cable tool. Rotary rigs were of the Failing 1500 variety driven by chains and rotating sprockets. Drill rods were tightened and broken apart with 36- or 48-inch iron pipe wrenches with "cheater bars" (pipe slid on the wrenches to make them longer). Cable tool rigs were of the same type employed over the last 100 years, with the casing "pounded" into the ground. Drilling was a very physical occupation and strength was very important - lifting pipe, drill rods, tightening couplings, and mixing 94-pound bags of cement.

In the 1980s, hydraulics revolutionized the drilling (and many other) business(es). Physical size and strength were not as important, drill rods were lifted with high-speed wirelines to carousels, which were "automatically" fed to the tophead drive motor. Air and percussion hammers sped up the drill penetration rate. The need to lift more than 50 pounds of weight is now almost a thing of the past.

The "good ol' days" may not have been so "good". New and innovative ideas have made drilling easier, faster, safer, and more profitable. I urge you to explore new ideas and see the many new ways in which the drilling industry is evolving. Go to state, regional, and national groundwater shows every chance you get. Take classes, read trade magazines, and stay current with many products and methods to keep the drilling profession one we can be proud of.

Be open-minded to the young drill operators' ideas - they are the future of our profession.

Tom

Tom Kwader may be contacted via e-mail to michele@worldwidedrillingresource.com

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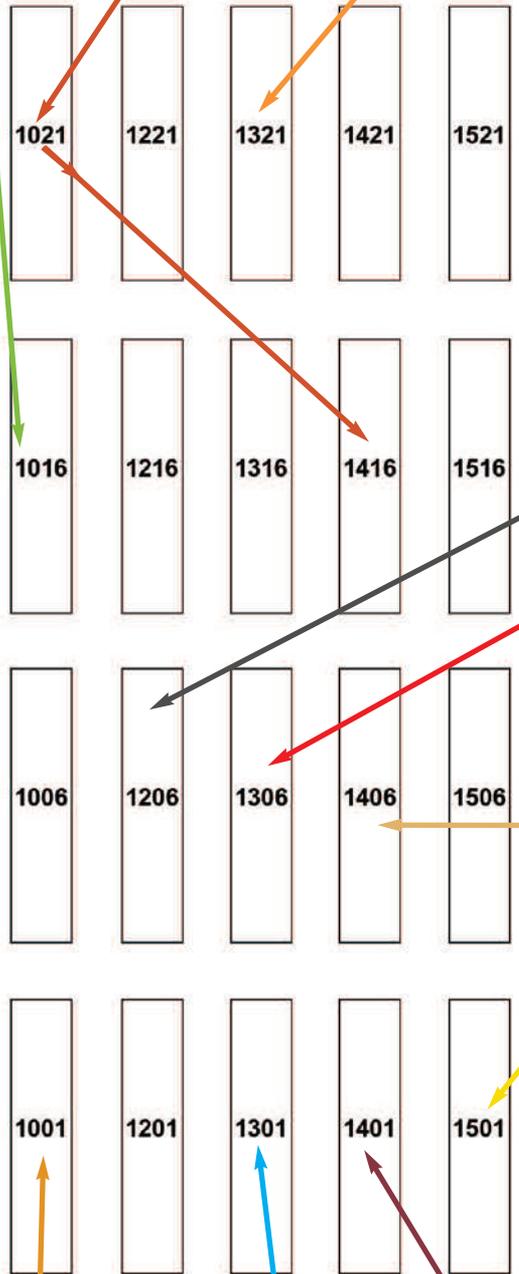
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Billion-Dollar Project to Mine Arizona Copper

Adapted from Information Provided by Resolution Copper Mining

Located in the historic Magma Copper Mine in the Pioneer Mining District of Arizona, Resolution Copper is one of the largest undeveloped copper deposits in the world. It lies almost 7000 feet below the earth's surface and is believed to contain more than 1.9 billion tons of copper ore.

In 2014, the Resolution Copper Project accomplished an important milestone by constructing the 28-foot-diameter #10 shaft to a final depth of 6943 feet, making it the deepest shaft in the U.S.

The company has used this project to collect geotechnical information needed to design a mine expected to produce 25% of the nation's copper demand.

Project Director Andrew Taplin said the project "will bring jobs and meaningful economic and community benefits to the entire region."

With over \$1 billion invested to sink the exploratory shaft to full depth, Resolution Copper is now focusing on working with regulators and the community to finalize operating plans and earn the permits necessary to responsibly and safely develop an operational, world-class copper mine. In March 2016, the mining company marked another significant milestone when the United States Forest Service opened a 60-day public scoping period under the National Environmental Policy Act (NEPA) for the proposed copper project near Superior, Arizona.

"We welcome the opening of the public comment period and the process to evaluate our Mine Plan of Operation and Land Exchange," said Taplin. "NEPA is entirely consistent with the way in which we develop state-of-the-art projects worldwide, and it is an important process that allows stakeholders to identify potential environmental and cultural concerns so that they can be analyzed and mitigated... Our values mandate that our project be open to public scrutiny and respectful to all views being expressed."

As the mine moves forward from project permitting to full operation, Resolution Copper seeks to create mutually beneficial partnerships in areas such as land stewardship, direct employment, and job training, along with contracting and commercial opportunities for local and Native American-owned businesses.

Editor's Note: In between our print issues, the *WDR* Team prepares an electronic newsletter called *E-News Flash*. Based on readership, this was the most popular *E-News Flash* article of the month. Get in on the action and subscribe today at: www.worldwidedrillingresource.com



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The Un-Comfort Zone II

by Robert Evans Wilson, Jr.

I Stole the Hope Diamond and Caught Leprosy How far has your imagination taken you?

During college, my girlfriend asked me if I had ever stolen anything. She had just told me, as a little girl, she took some-

thing from a gift shop without paying for it, and her parents severely scolded her. I shook my head, denying I had, and she persisted. Susan was so disappointed, it was apparent she wanted a story; and immediately my imagination kicked in. So I replied, "Well, never intentionally."

I told her when I was 12 years old, I accidentally stole something, and I probably shouldn't have been talking about it because I could still get in trouble for it. I explained it was something really big, and the owners still wanted it back. "Enough," she said, "Just tell me what you stole!" So I told her, "I stole the Hope Diamond."

I explained how I had gone to the Smithsonian Institute in Washington, D.C., on a school trip. We stopped at the gift store to buy something for our parents. I looked around and selected an imitation Hope Diamond for my mother. After paying for it, I put it into the side pocket of my suit jacket. I knew Susan had never been to the Smithsonian, which is the only way the story had a chance of working. (It was also 1978, you couldn't just look anything up on a smartphone.) I told her when we got to the gem and mineral section, one of the curators was conducting a laser light show with several crystals including many of the world's most famous gemstones. In addition to the Hope Diamond, there was the Star of India, the Red Ruby of Russia, the Irish Emerald, and others whose names I didn't recall. On the other side of the table, the man would place one of the gems in a metal holder on a stand, shoot the laser beam through it, and explain how it refracted the light. I pushed through the crowd to see better and when I got up to the velvet rope, I saw the Hope Diamond right in front of me. I was curious how close my imitation looked to the real thing, so I pulled it out of my pocket and held it out in front of me, but I needed to see them side by side to know for sure. So, I picked up the Hope and held them in front of me, one in each hand. I couldn't tell any difference. The imitation was really good. I told Susan how each was big enough to fill my fist and they seemed to weigh about the same. As I reached out to drop the Hope back on the table, I opened my other hand and gently tossed the imitation one in the air. The movement caught the eye of the security guard who was standing nearby. He snatched the imitation out of my hand, and yelled, "Hey, no touching the gems!" He grabbed me by the shoulder and started shoving me toward the door. I tried to tell him he had gotten the wrong stone, but he cut me off. He was so rough and mean to me, I shoved the real Hope Diamond in my jacket pocket and walked out. So I didn't mean to steal it. It was an accident. "Where is it now?" Susan asked. I told her it was in a desk drawer with a bunch of broken crayons, marbles, plastic soldiers, and Matchbox cars back in my room at my parents' house. "You put the Hope Diamond in a junk drawer with old toys?"

I told her I didn't know where else to put, and besides, Billy and I would sometimes spin it like a top. (He was my childhood best friend, and also my roommate, so Susan knew him.) "Billy knows you stole the Hope Diamond?" She didn't believe a word of my story, so I needed something else; a final proof. Then inspiration struck, and I asked if she remembered why I didn't take a job offer at UPS. She said it was because they wanted to take fingerprints and file them with the FBI. I nodded, then just looked at her. It only took a minute, but she cried out, "You didn't want the FBI to have your fingerprints because your fingerprints are on the imitation Hope Diamond. You did steal it!"

Just then, the front door opened and Billy walked in. Susan turned around and asked him point blank, "Did Bobby really steal the Hope diamond?" Now Billy and I had been telling each other tall tales for years, so I hoped he'd help me out. Behind Susan's back, I made a motion with my hand like I was spinning a top. He understood and confirmed we used to spin it like a top on his bedroom floor. That cinched it. Susan completely bought the story.

The next morning, I confessed it was all a tall tale. She was furious! She couldn't believe I had convinced her I stole the Hope Diamond. She said she was going to get even with me.

I didn't give it another thought. Two weeks passed, and I was talking with Susan on the phone when she told me a girl on her hall in the dorm had been sent home with some rare illness (a girl Billy had tutored). The next day, she told me the girl had been diagnosed with leprosy. She explained the girl had once lived on an island in the Caribbean near a leper colony; and the disease had been dormant in her body for years. Meanwhile, I was keeping Billy up to date on the story.

The following day, she told me anyone exposed to the girl, was going to have to get tested, and, they should be on the lookout for any unusual rashes on their extremities. Susan knew Billy had a rash on his ankles his doctor couldn't diagnose; he had been given two different creams, and neither worked.

The day after, when she knew I was at work, she called the apartment knowing Billy would answer the phone. She was crying as she asked to speak to me, but Billy told her I wasn't home, then asked why she was crying. At first she wouldn't say, but he insisted. She said she tested positive and would be sent away to a special hospital. Billy hung up and called me at work. "Bobby, Susan called; she tested positive. If she's got it, then I've got it." I thought I must have it too. Susan said there was a Leprosy Task Force set up at the school clinic, and it was where we needed to go. I left work immediately to pick him up so we could go to the clinic together.

I was a nervous wreck as I entered the clinic. Billy was worse. We ran to the receptionist and asked, "Where do we go for the Leprosy Task Force?" She looked at us like we were crazy, and said she didn't know what we were talking about.

Suddenly, behind us, we heard peals of feminine laughter. We turned around to see Susan and several of her dormitory mates. She cried out, "You guys are so gullible!"

We had both used our imaginations to concoct fun tall tales. Imagination is the heart of creative thinking. It's not just for stories. It's where we combine and connect diverse pieces of knowledge from our own minds into something bright, new, and useful. Invention starts with imagination. How far have you allowed your imagination to go?

Robert

Robert is an author, humorist, and innovation consultant. He works with companies that want to be more competitive and with people who want to think like innovators. For more information on Robert, visit www.jumpstartyourmeeting.com or contact him via e-mail to michele@worldwidedrillingresource.com



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Adapted from Information by International Construction Equipment, Inc.

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Many people have worked their way through the ranks in the deep foundation business. You start by driving a pile and working your way into a bigger and more complicated and successful (stressful) role. This is exactly how it was for Christian Cunningham who has been associated with ICE since he was a small child watching his dad and business partners grow the idea of a company into an international success.

In October 1995, Christian took the plunge and became an official ICE team member. He took his college education and put it to use by working on the assembly floor and traveling with the sales team to jobsites. He gathered information on the integral workings of all ICE equipment, troubleshooting, and customer suggestions and directly applied them to process, procedure, and equipment improvements - making wasted time and energy a thing of the past. He quickly learned firsthand experience coupled with his education was worth its weight in gold to improving the company product, communications, and structure.

Christian left North Carolina and began moving around the USA, stopping in branches for years at a time to help restructure and improve service. Along his path, he worked wrench-to-wrench with the company's seasoned service management team. These great men taught him the ins and outs of field service. Taking this tribal knowledge and coupling it with his strong organizational skills, Christian was able to turn ICE branch locations into their own profit centers.

He continued to push quality and standards by building a strong seasoned team which could improve production, efficiencies, and keep up with demand. This team under Christian's direction was able to expand and keep communication open with branch locations and customers. After a few years of hard, backbreaking work, 6-7 days a week, ICE made huge improvements. The company began to grow and has soared to the top, based on one man's determination and drive to service customers.

Christian Cunningham's story has taken just over 20 years to manifest itself. It is a story overly deserving of a spotlight for his determination to start at the core and learn every aspect of what is important to ICE customers and team members.



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The Perils of Comparison

by Tim Connor

I can't tell you how many people I have met during my world travels when, after only a few minutes of conversation, they started comparing themselves to someone or something else - a competitor, fellow employee, or someone they didn't even know.

Why do we need validation by comparison? Why do we need to feel better than others? Why can't we accept who we are and what we have accomplished without the ego's need to look better than others?

As a global speaker for many years, this is especially true in my profession - but we are not alone.

Trust me, you don't have to be the smartest, best looking, wealthiest, or most famous person in the room to feel good about yourself. So why are so many people stuck in the comparison mode, whether subtly or in your face?

Not to brag here (it is not my intent), but I want to make a simple statement - during my career as an international best-selling author (over 80 books) and a global speaker (25 countries), my intent and goal was never fame - and let me state that I have been successful in achieving this. Go ahead, laugh.

Life is not about what others think of you or you think of others - and if it is, trust me, you will never find contentment, inner peace, or happiness because there will always be someone out there smarter, better, and wealthier, etc. than you.

Have you ever noticed when people generally compare themselves to others they either use someone less successful or someone who they can criticize whether this person deserves it or not?

I can also tell you many of my heroes - Og Mandino, Mark Twain, Will Rogers, Jesus, Winston Churchill, Mother Teresa, and Charlie Tremendous Jones to name a few - comparison was not in their DNA.

What they all had in common was the humility and desire to contribute in their own special way to the value of humanity and life in general.

Let me ask you - have you ever compared yourself to others to try and convince yourself or make yourself feel better by others than you really were? Come on - be honest here.



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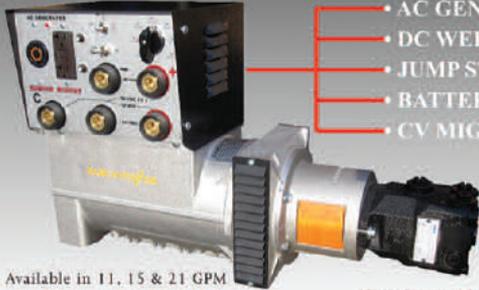
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Why do we need to compare? Is it insecurity, the need for approval, desire to please, or simply the fact we can't admit we all have flaws and weaknesses in our thoughts, actions, decisions, and attitudes?

I challenge you for the next couple of weeks, as you talk with others, to observe their comparisons or your own during conversations, and then ask yourself - why? Why do I need to do this? Why do they need to do this?

Try it and you will be amazed at how frequently we are all guilty.

In His service,

Tim

Tim may be contacted via e-mail to michele@worldwidedrillingresource.com



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Benjamin Coray, PE, Exploration Manager, Applied GeoTech, Sandy UT*

3230_{DT} Fits Geotech Needs



(top photo) On the second day of owning the rig, Applied GeoTech advanced the Geoprobe® Nova Cone CPT to 100 feet for a new performing arts center in the suburbs of Salt Lake City. (above) Mud rotary being used to evaluate liquefaction potential in a lowland area of the Salt Lake Valley being considered for development. (below) Rock coring in uneven terrain at a local Utah ski resort using the 3230DT and wireline tooling.

Within weeks of joining the Applied Geotechnical Engineering Consultants (AGEC) drill rig lineup, they tested the limits of the Geoprobe® 3230DT on several deep exploratory borings utilizing the 4-in. direct push casing. "We were impressed that we could advance the exploratory holes through dense sedimentary soil deposits to depths of up to 120 feet with the GH70 hammer while obtaining SPT samples every 5 feet," said Benjamin Coray, P.E. with AGECE in Sandy, UT. "For us, one of the significant advantages of the direct push system is the pull-out and clean-up time. Not having to clean augers and dispose of cuttings saves us significant time and effort."

Using the 3230DT for cone penetrometer, testing has also been a major success for the company. Using the Geoprobe® Nova Cone CPT with the addition of the seismic geophone, "We've easily pushed to depths in excess of 100 feet (most likely deeper if we hadn't run out of rod)," Ben added. "The efficiency with which we are now able to obtain seismic shear wave profiles on our projects has given us a unique advantage over our competition. What used to take several days at a significant cost can now be done in an afternoon," he said.

AGEC has also found that the 3230DT is excellent for mud rotary and coring work and is "a joy" to operate. Being able to separately adjust weight on bit, rotation speed, and pump flow allows for excellent operator control while drilling in Utah's varied soil and rock formations. They have explored to depths of up to 170 feet in Salt Lake City lakebed sediments and gravels using rotary wash methods.

They also tested the rig's abilities on the slopes of a local ski resort east of the city. The project required rock coring to a depth of 50 feet in hard quartzite sandstone halfway up a ski run with grades of 35 to 40 percent. According to Ben, "The rig, fully loaded with heavy tooling, climbed the slope with ease. The low center of gravity of the 3230DT gave us confidence while traversing slopes that we would not have tried with our other rigs. The mast oscillation allowed us to stay plumb despite the uneven terrain."



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Geothermal Residential Radiant Floor Heat

by Peter Tavino
Litchfield Geothermal



Publisher's Note: Although this article is not about geothermal drilling, we found it interesting and thought you may feel the same.

When I trained IGSHA (International Ground Source Heat Pump Association) installers in Indianapolis, Indiana, a few years ago, I was impressed by the Indiana Warm Floors company which provided customers with radiant floor heat as their main business. Generally, cold floors are not a solution for residential cooling air conditioning, so the vast majority of geothermal heating and cooling systems use ducted forced hot or cold air. Radiant floors here in the northeast are redundant systems which are in addition to the water-to-air ducted heat pump operations. Comfort comes at a cost to install both ducts which alone do the job, and radiant tubing for warm floors, as well.

While 1% have no problem with this, we geothermers strive to improve the indoor environment for all at a reasonable cost. One new house with geothermal I installed, had staple up radiant at the prefab factory. It did not use tubing within the plywood, which is of course more efficient. Once up and running, the owner tried turning the air handlers off and heating in frigid weather with the radiant floors alone, and was disappointed it could not keep up. The prefab designers had not spaced the tubing for 100% heat, so the owner now keeps the blower fan on for heating and has warm but not hot floors for his comfort. This is better for oak floor shrinkage issues too.

With a recent job on Long Island, New York, the owner similarly wanted to add new radiant plywood floors and retrofit his ductwork to geothermal on a budget. He wished to remove his heating oil tank and did not want propane radiant heat. Another

water-to-water heat pump would have been required, in addition to two new water-to-air split systems, for his two existing air handlers. One large water-to-water with less efficiency did not appeal to him compared to refrigerant-based heating and cooling by line set. The need to switch from heat to air conditioning quickly without waiting for tank reset by a day or so, was important to him. Combination water-to-air and water-to-water heat pumps are very costly too. He had a separate new hot water heater, and did not require a desuperheater and new domestic hot water buffer tank. So we considered using the inexpensive desuperheaters for two new water-to-air heat pumps, to power his new first floor radiant.

From the Performance Chart as shown, the Hot Water Capacity (HWC) in the last column shows hot water capacity at about (2.5M) 2000 Btu/hr average part and full load, for the 3-ton first and basement unit, and 1500 Btu/hr for the 2-ton upstairs unit. This totals 3500 Btu/hr at the lowest 30°F (-1°C) Entering Ground Loop Water Temperature (below my 34°F (1°C) design with hot water extra), so figure about 4000 Btu/hr cold weather operating output.

1000 CFM Nominal Airflow Heating, 1000 CFM Nominal Airflow Cooling													Performance capacities shown in thousands of Btu/h												
EWT °F	Cooling - EAT 80/67°F												Heating - EAT 70°F												
	GPM	WPD		CFM	TC	SC	kW	HR	EER	LWT	TTS HWC	TTP HWC	GPM	WPD		CFM	HC	kW	HE	COP	LAT	LWT	TTS HWC	TTP HWC	
		PSI	FT											PSI	FT										
20	2.0	1.4	3.3	1010	41.9	25.8	1.68	47.6	24.9	70.0	1.8	1.7	9.0	8.3	19.2	1010	23.9	2.12	16.7	3.3	91.9	16.3	2.0	1.9	
	2.0	1.4	3.3	1250	43.1	28.8	1.77	49.1	24.3	70.0	1.9	1.8	9.0	8.3	19.2	1250	24.5	2.01	17.6	3.6	88.1	16.1	2.1	2.0	
30	2.5	1.2	2.7	1010	41.9	25.8	1.68	47.6	24.9	70.0	1.8	1.7	4.5	2.6	6.0	1010	26.0	2.15	18.7	3.6	93.9	21.7	2.3	2.2	
	2.5	1.2	2.7	1250	43.1	28.8	1.77	49.1	24.3	70.0	1.9	1.8	4.5	2.6	6.0	1250	26.6	2.04	19.7	3.8	89.7	21.3	2.4	2.3	
	2.5	1.2	2.7	1010	41.9	25.8	1.68	47.6	24.9	70.0	1.8	1.7	6.8	4.6	10.6	1010	27.1	2.17	19.7	3.7	94.9	24.2	2.5	2.4	
	2.5	1.2	2.7	1250	43.1	28.8	1.77	49.1	24.3	70.0	1.9	1.8	6.8	4.6	10.6	1250	27.7	2.06	20.7	3.9	90.6	23.9	2.6	2.5	
	2.5	1.2	2.7	1010	41.9	25.8	1.68	47.6	24.9	70.0	1.8	1.7	9.0	6.9	16.0	1010	27.7	2.18	20.2	3.7	95.4	25.5	2.5	2.4	
	2.5	1.2	2.7	1250	43.1	28.8	1.77	49.1	24.3	70.0	1.9	1.8	9.0	6.9	16.0	1250	28.3	2.07	21.3	4.0	91.0	25.3	2.6	2.5	
33	3.3	1.3	2.9	1010	41.9	25.8	1.68	47.6	24.9	70.0	1.8	1.7	4.5	2.0	4.7	1010	29.5	2.21	21.9	3.9	97.0	30.2	2.8	2.7	
	3.3	1.3	2.9	1250	43.1	28.8	1.77	49.1	24.3	70.0	1.9	1.8	4.5	2.0	4.7	1250	30.2	2.10	23.0	4.2	92.4	29.8	2.9	2.8	

4000 ÷ 23,575 Btu/hr design load = 17% of heat to rooms through the floor during the coldest days, and more on average winter days. This will keep the floors in the high 80s that will not heat 100% by itself, but will give warm floor comfort, which is all he really asked for.

*The statements and comments in this article are based on information and references believed to be true and factual. If you have any questions or comments, please forward them to me in care of **WWD.R.***

Pete

Peter Tavino may be contacted via e-mail to michele@worldwidedrillingresource.com

In Memoriam

Robert K. Crews (1958~2016)

The Arizona Water Well Association reported the passing of Robert K. Crews of Glendale, Arizona, on March 10, 2016, doing what he loved. During his career, Robert worked for various companies including Christensen Boyles, Layne Christensen, Drilling Services, Far West, and most recently Cascade.

He had an eclectic range of interest and hobbies like playing the ukulele, riding dirt bikes, collecting pocket knives, outfitting his Jeep, and crocheting. He was a great guy who will be missed by many. His family wishes to express their heartfelt thanks to his drilling brothers for all they did for him.

Robert is survived by his wife Jeanne; children Nikki, Chantell (David), and Brandon; grandchildren Lance, Promise, Laila, Logan, and Ellie; his mother Connie, and brothers Roger and Mike.

The management and staff of **WWD** extend their condolences to Robert's family, friends, and colleagues.



Jesse Merwin Odom (1926~2016)

The Arizona Water Well Association also reported the loss of Jesse Merwin Odom on March 14, 2016, at his home in Buckeye, Arizona. He was 89.

Born in Shreveport, Louisiana, Jesse had an identical twin, William. They did everything together, including joining the U.S. Navy in 1944. He married Harriett in 1949. He was in the drilling and pump service business for most of his life, owning Odom Drilling for about 30 years. He was past president of the Arizona Water Well Association and an active member for many years.

Jesse's interests were roping, working in his wood shop, and telling stories about the past to all who would listen. He was a giving man and a great friend.

Gary is survived by his wife Harriett. He was preceded in death by his parents, brother William, sister Dean, and his son Gary.

The management and staff of **WWD** express their sympathies to Jesse's family and friends.



Richard "Dick" Washburn

The New England Chapter of the International Society of Explosives Engineers gave the sad news Richard "Dick" Washburn passed away suddenly on March 21, 2016, in Port Charlotte, Florida.

He retired in 2007 from a career in the commercial explosives industry, and was the president of Patriot Explosives, Inc. of Kingston, New Hampshire. After retiring, he moved to Florida, where he enjoyed many warm winters and new friendships. Summers were spent in a cottage on the shore in New Brunswick, Canada. His big loves were history, politics, golf, and being outdoors. He was outgoing, friendly, and honest.

Dick is survived by his wife of 44 years, Frances; sisters-in-law Sue and Judy (Richard); nephews Michael and Johnathan; and extended family throughout Canada and the U.S.

The management and staff of **WWD** express their sympathies to Dick's family and friends on his loss.



Eugene W. "Gene" Mattila

(1951~2016)

WWD was saddened to hear Eugene W. "Gene" Mattila passed away April 5, 2016, after a short illness. He lived in Wheatridge,

Colorado, and was the business line manager for Atlas Copco Rock Drilling Tools, Mining, Rock Excavation, and Construction LLC. After graduation from Wakefield Michigan High School, he achieved a degree in engineering from Houghton University.

Gene is survived by his wife GERALYN, sons Derek and Martin, and daughter Amy.

Lest we forget...

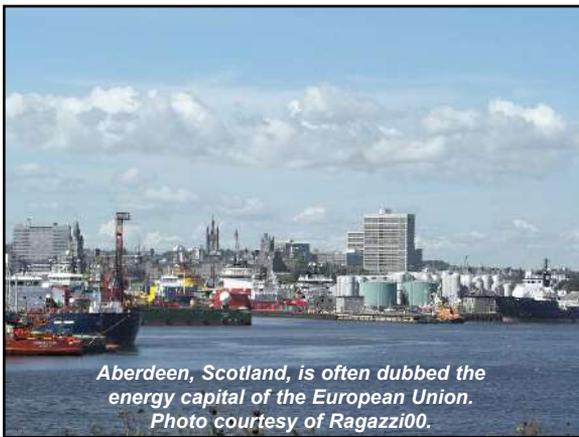
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Aberdeen, Scotland, is often dubbed the energy capital of the European Union. Photo courtesy of Ragazzi00.

Europe's Oilfield Equipment Market is Set to Grow

Adapted from Information Provided by Grand View Research

Flexible drilling techniques have already emerged as a separate growth industry in North America and are now expected to gain importance in other regions, including Europe. As a result, the European oilfield equipment market is expected to reach \$18.71 billion by 2022, according to a new report by Grand View Research, Inc. Horizontal and directional drilling activities are set to drive revenue growth over the forecast period.

Falling crude oil prices have been a crucial factor holding back growth in the regional oilfield equipment market. Stable crude oil prices

in the near future could aid the oilfield equipment industry's recovery.

The drilling sector was the leading product segment with revenue share exceeding 65% in 2014. Key factors expected to drive the drilling machinery industry include technological advancements in techniques, increasing demand for horizontal and directional drilling, and use of digital services. Drilling is also expected to witness the highest growth of 1.9% from 2015 to 2022.

Further key findings from the report suggest:

- Russia emerged as the leading regional consumer and accounted for over 55% of total revenue in 2014. The country is expected to continue dominating due to its huge production levels from oilfields.
- Norway is expected to witness the highest growth of 2.2% from 2015 to 2022.
- Europe's oilfield industry is fragmented with the presence of a large number of multinational corporations, along with regional companies. Some major companies operating in the regional market include Zenith Oilfield Technology, SBS Oilfield Equipment GmbH, Atlas Copco, Schoeller-Bleckmann Oilfield Technology GmbH, Foster Wheeler AG, KSB AG, Sandvik AB, Vallourec, Sulzer Limited, Technip SA, and Tenaris SA.



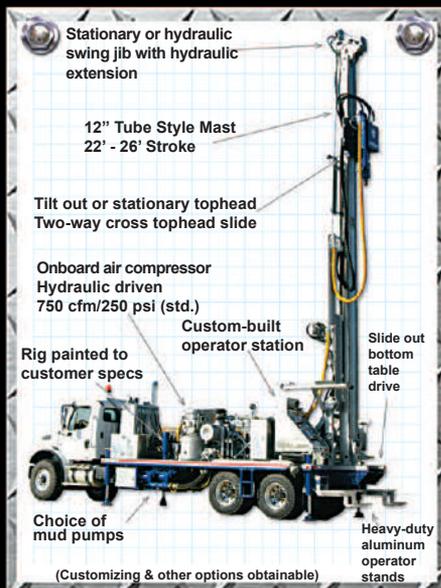
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Where Did All that Electricity Go?

by Ray Roerick
Sales Manager, Well-Vu, Inc.

Many a pump repair person has experienced at least part of this. You get the service call a customer's pump is not working after a storm came through. You already know the lightning took out the pump, or at least the control box. So you check it out, determine the pump is bad, and pull it.

Sure enough, on the side of the motor, about halfway down, is the telltale little black hole with a blue ring around it. You replace the pump, and a few days later the call comes, "You screwed up my well. Now we are getting sand." Then comes the usual threats of you needing to put in a new well for FREE, their brother is the largest attorney in the state, and on it goes. You can explain all you want, but the bottom line is, more than likely the electricity that went out the motor also went directly out the side of the casing.

Now here is how you prove it. Pull the pump back out, measure the depth of the pitless, add the total length of drop pipe, and add the length of the pump to the middle of the motor. Now go down with your video camera to that depth, and there in plain view, is the same black hole with blue ring around it. The first time I saw this was like a smack in the head, thinking this is really logical, but without a camera it would be speculation or professional guess at best.

Next, to show the customer it was the problem, I left the camera in the well, put the pump back into the static about ten feet, and pumped the well over the side of the casing while watching the video monitor. Within seconds of turning on the pump, the video camera showed small particles of silt and sand flowing out of the hole and going up into the pump intake. Not my fault, but definitely found the problem.

This simple camera once again came in handy to help communicate what I knew and needed to prove beyond a shadow of a doubt to the customer to maintain good relations and help resolve a problem.

Ray

Ray Roerick may be contacted via e-mail to michele@worldwidedrillingresource.com

[after the 2016 Best in the West Drill and Blast Conference]

We had several individuals who came by the booth and said what a good publication the *WWD* Team puts out. Also, when they go to the mines and look around, they see the magazines and can tell the ones that get read and the ones that just get thrown to the side.

Froy Cunningham
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DRILLING AND BLASTING TO DEEPEN THE DELAWARE RIVER

Compiled by Amy White, Associate Editor, *WorldWide Drilling Resource*®

After more than five years of work, the Delaware River Main Channel Deepening Project is nearing its final phase. Since 2010, the Army Corps of Engineers has been dredging the channel from 40 to 45 feet - the updated standard for ports to accommodate huge ships set to transit the newly-expanded Panama Canal once it's finished.

Army Corps spokesman Ed Voigt said the Delaware River is the last remaining 40-foot-deep port complex on the East Coast. It's also one of the busiest in the nation, moving over 70 million tons of cargo annually, and almost 100% of the East Coast's oil supply. The Delaware River project will not only enable larger ships to transit the river, but current ships will be able to carry heavier loads through the deepened channel.

The \$360 million dredging project was divided into eight contracts. The final two contracts are the only ones left to complete. The latest work included drilling and blasting from a barge to pretreat seabed rock formations in the river. The presence of these rock formations made this the only section which could not be deepened entirely by hydraulic or mechanical methods.

The Drillboat Apache, operated by Great Lakes Dredge & Dock Company ran 24/7 until March 2016 to remove the first portion of 320,000 cubic yards of rock along the river-bottom between Claymont, Delaware; and just south of Philadelphia International Airport. Workers drilled into the rock outcrops, planted explosive charges, and set them off twice a day. The debris was then scooped up by mechanical dredging and hauled away.

Due to seasonal environmental concerns over endangered Atlantic and shortnose sturgeon populations, drilling and blasting can only be performed from December until March. Workers will resume operations in December 2016, with completion set for March 2017.

The Panama Canal Expansion is expected to be complete in 2016. By allowing the same large vessels transiting the expanded Panama Canal to reach ports on the Delaware River, the river channel deepening project will make way for regional ports to evolve with the changing shipping industry and stay competitive.



The Great Lakes Dredge & Dock Company Team retrieved blasting wire after conducting rock blasting operations in the Delaware River. Photo courtesy of the Philadelphia District Army Corps of Engineers.

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Ronnie,

I just wanted to say that even though I have nothing to do with the mining industry per se, I can't wait to get our copy of *WWD* to read your column. I just love how down-to-earth, sincere, and sometimes very funny you are. I feel like I kind of know you even though we've never met. Have a great rest of your week.

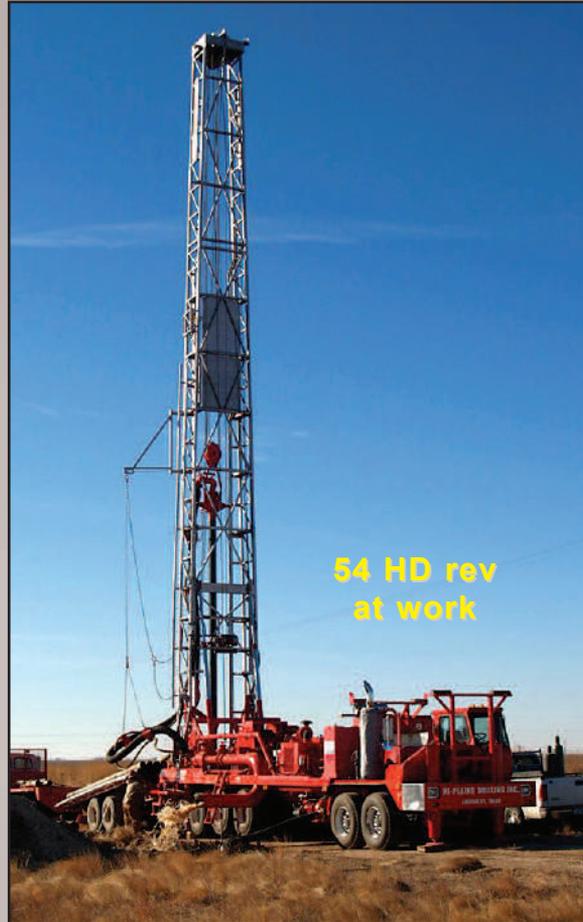
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Photo by George Jumara, flickr.com

Savannah's Sonic Rig is a Big Hit

Adapted from Information by the Army Corps of Engineers, Savannah District

A powerful tool enables the Savannah District Explorations Unit to provide unique capabilities in challenging terrains across the nation. The sonic drill rig - a piece of high-tech machinery which is the only one of its kind within the federal government - has been assisting numerous customers in subsurface and geotechnical investigation projects throughout the nation.

Arriving in 2014, the sonic drill gave Savannah's drilling team increased capability to penetrate through all soil types and most rock. It causes minimal disturbance to drilling areas, reduces investigation-derived waste, and saves time in the overall sampling process due to safety and efficiency improvements. The rig also provides increased speed and maneuverability in challenging terrain and difficult subsurface conditions where traditional rotary drilling proves less effective. Because of these advantages, sonic technology is a preferred method of drilling on all earthen embankments associated with dams and levees, said Steven Widincamp, Chief of the Explorations Unit in the Savannah District.

Widincamp and his Team had the foresight to procure an in-house sonic drill rig - already a standard in the private sector - to offer a more responsive alternative to U.S. Army Corps of Engineers (USACE) districts and other federal agencies. Now the district's in-demand sonic rig is regularly hired by customers who don't have in-house drilling capabilities or programs large enough to support the cost of a drill.

"We saw this several years back," said Widincamp. "Having this drill allows us to develop expertise in sonic drilling which leads to better scope and estimate preparation when contracting for these services throughout the nation. It also ensures that the American taxpayer is getting the best value for its tax dollar."

The drill dominates in severe conditions and minimizes risks when investigating dams and levees because operators have the option to not use water which poses risks to hydraulically fracturing structures. It easily drills through material most drill rigs have difficulty penetrating, such as sites with extensive layers of cobbles and boulders. It also bores at a rate significantly faster than traditional methods, said Widincamp.

Recently, the rig was able to drill through 100 feet of cobble and soil strata per day on an assignment at Oregon's Umatilla Army Depot. Later, the sonic rig drilled one of its most consequential sites - Chicago's Electrified Fish Barrier - to mitigate impacts from Asian carp on the Great Lakes ecosystem.

Its operators must undergo extensive, specialized on-the-job training to become proficient in the rig's technology. The in-house capability also allows District geologists and engineers to develop new skills, hone old skills, and remain proficient in emerging technology. Though ripe with professional advantages, significant personal sacrifices are required: operators spend an estimated 90% of the year away from home and family due to travel demands.

"We execute more in-house drilling work than any other district with drilling capabilities," said Widincamp. "It's a tough niche to fill. We have to find the perfect blend of guys with the right skill set and attitude towards this type of work. They are some of the hardest positions to fill in the Corps."

Its operators are part of a small, yet vital subcommunity executing some of the most difficult USACE projects. Counterparts across USACE value their expertise, personnel, and resources to support missions nationwide.

"The sonic technology is gaining popularity within USACE," said Widincamp. "The kind of work we do helps a wide range of agencies and customers. We're able to take on some of the more difficult projects, offer flexibility, and make sure we're using standardized processes to provide good quality assurance and control. It's a collaborative process and customers are very pleased with this working relationship."

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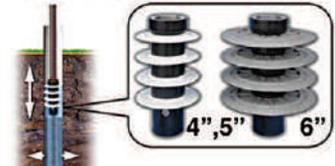


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Innovative Solution for Seawater Intake

Adapted from Information Provided by Ramboll

Ramboll, an engineering, design, and consultancy company completed the complex and demanding task of implementing a seawater intake at Norway's new National Museum located in central Oslo. A state-of-the-art drilling solution helped avoid what could have been a messy and chaotic situation.

The seawater intake was designed to pump water from the Oslo Bay for heating and cooling of the new museum building. Additionally, two stormwater pipelines were installed for flood-risk mitigation to lead rainwater away from the roof and surrounding site.

To avoid disruption with expansive digging, directional drilling was implemented for the seawater intake. It had to be performed underground and below sea level in mixed soil conditions ranging from rocks to clay.

So contractors could work in dry areas below sea level, special "habitats" were fabricated from steel boxes which were lowered into the sea. This solution benefitted the city as four large pipelines were installed without disturbance to citizens.

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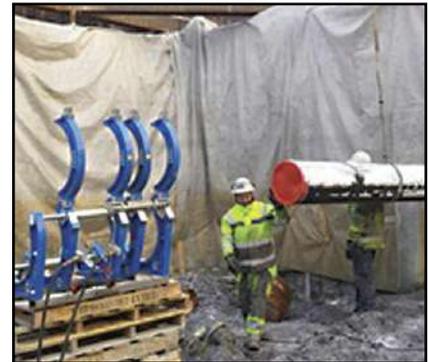
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The museum site brought even further challenges since it is located on a former landfill. According to Ramboll Civil Engineer, Vegard Svendsby, "The landfill site made it hard for us to predict what we would encounter when drilling. We were in risk of encountering something the drill could not pass." The solution was to drill a pilot hole to test conditions.

Many varying techniques were customized to drill holes for this complicated project. Fortunately, these techniques can be transferred to future projects in Norway, as well as other countries.



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June Birthstone is Pearl

by Harry W. Short, Engineering Geologist

Pearl, the June birthstone, is a hard, white, round object valued as a gemstone for use in jewelry. Its value in jewelry is determined by a combination of luster, color, size, lack of surface flaws, and symmetry, which is appropriate considering the type of pearl.

Not mined, pearls form inside the shells of oysters in response to irritation from objects such as sand grains inside their shells. Layers in the pearl are the minerals aragonite or calcite. The calcium carbonate (CaCO₃) in the two minerals is held together by an organic compound named *conchiolin*, often called *narce*, meaning *mother of pearl*.

The unique luster of pearls depends upon the reflection and refraction of light from their translucent layers. The iridescence some pearls display is caused by the overlapping of successive layers which break up light falling on the surface. Pearls are usually white, sometimes with a creamy or pinkish tinge, but may be tinted yellow, green, blue, brown, purple, or black. Black Tahitian Pearls are highly valued because of their rarity. The culturing process for black pearls produces a smaller number since they are often rejected by the host oyster.

Before the 20th century, divers pulled oysters from ocean floors and river bottoms and checked each individually for pearls. Only three or four oysters in three tons produce perfect pearls. Now, almost all pearls used for jewelry are cultured by planting a core or nucleus into pearl-producing oysters. Pearls are usually harvested three years after planting, but it can take six years or longer before a pearl is produced.

Pearls come in eight basic shapes: round, semi-round, button, drop, pear, oval, baroque, and ringed. Perfectly round pearls are the rarest, highly valued, expensive, and are generally used in necklaces or in strings of pearls. Irregular and button pearls find use in necklaces.

Pear-shaped pearls are sometimes referred to as teardrop pearls and are most often seen in earrings, pendants, or as a center pearl in necklaces. Baroque pearls have a different appeal than the more standard shapes; they are often highly irregular and make unique and interesting shapes. Ringed pearls are characterized by concentric ridges, or rings, around the body of the pearl.

Minnie Pearl is not included herein since she was a Grand Ole Opry star.

Harry

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The Well that Changed Everything

by Amy White, Associate Editor, *WorldWide Drilling Resource*[®]
with Information from Ryan Herljac and Ryan's Well Foundation



Ryan Herljac was keynote speaker at the Groundwater Expo in Las Vegas, Nevada, in 2015. *WWDR* photo.

Ryan Hreljac said his story is really very simple. One day in 1998, he was sitting in a Grade One classroom in Canada. He was six years old. His teacher, Mrs. Prest explained people were sick and dying because they didn't have clean water. She told the class some children in Africa walked hours just to collect dirty water. Ryan said the kids became angry at the teacher because she revealed the world was not fair.

"All I had to do was take ten steps from my classroom to get to the drinking fountain and I had clean water. Before that day in school, I figured everyone lived like me. When I found out this wasn't the case, I decided I had to do something about it." When the teacher asked who wanted to help raise \$70 for a project to drill a well in Africa, Ryan raised his hand.

Ryan said he was not a "high-achiever" in school. He thought he would just ask his parents for the money, they would give it to him, and the world would have access to clean water, easy enough; but Ryan had a lot to learn. He went straight home and begged his mom and dad for help. His parents told him if he really wanted the money, he could do extra chores to earn it. Ryan worked four months for \$70, only to learn it would cost around \$2000 to complete a well in a place like Uganda. "That's how my little Grade One project became the Ryan's Well Foundation."

Ryan said he simply could not get the project out of his head. He wanted to keep going, and thought maybe he could just do a few more chores. Ryan's parents suggested he get out of his comfort zone and talk to people in the community to rally support. He took their advice, and at age seven, Ryan gave his first speech to the Rotary Club. From there, he continued speaking to service clubs, school classes, and anyone who would listen about raising money for a well at Angolo Primary School in Uganda. The community got involved and went on to raise the money needed to drill the well in Uganda; and it became the well that changed everything.

In 1999, Ryan started writing to Jimmy, a pen pal at Angolo Primary School. Before the well was drilled at his school, Jimmy had to get out of bed at midnight and walk five miles to the nearest water source multiple times. "I had to go back and back again to fill the pot we used at home for cooking and washing," said Jimmy. The water was not clean. It looked like chocolate - but it was the only source available before Ryan's well was built.

After the well was constructed at Jimmy's school, he could simply bring water home. Jimmy said the well made a big difference in all the students' lives, including his. "After the well was built, I didn't have to walk too far, just wake up like a normal kid..." He said having water gave him time to just play and have fun.

In 2003, Jimmy's village was facing many problems due to a rebel group looking to overthrow the government. He was abducted by the rebel army, but thankfully managed to escape and find his friend Tom Omach, a project coordinator for Ryan's Well. It took some time - and a lot of paperwork - but eventually, Jimmy went to Canada to live with Ryan and became part of his family.

In 2007, Jimmy graduated high school and became a Canadian citizen. He received a degree from St. Francis Xavier University in Nova Scotia in 2012. Jimmy said he lives in a different world now, and has to do things differently. "For me, now I just wake up, wipe my face, and... Hallelujah! Life is good."

As for Ryan, he went on to graduate from University of King's College in Nova Scotia. After completing studies in international development and political science, he remains involved with Ryan's Well Foundation as a project manager. He is a sought-after keynote speaker at events across the globe, and has been featured on international media such as the *Oprah Winfrey Show* and CNN. His Foundation has received support from prominent individuals, including the Prince of Wales, Craig Kielburger, Matt Damon, and Dr. Jane Goodall.

Ryan still views himself as an ordinary kid who loved video games, and just wanted to help make the world a little more fair. He said the hardest thing he ever did was raising his hand in class that day when the teacher asked for help. Ryan's key message is anyone, no matter what age or circumstance, can make a positive change the world. "You don't have to be someone remarkable to make a difference." He said Ryan's Well Foundation is not a success because of superheroes; it became possible because of friends and neighbors.

Fifteen years after that first well was drilled in Uganda, Ryan made a trip back to the site at Angolo School. Over 4000 people came out to greet the young man who changed their lives all those years ago. It was an emotional and fascinating visit for Ryan and his family as he talked to hundreds of people whose lives had drastically improved forever because of his childhood dream. Forming the same long line as they had years earlier, the crowd burst into applause when Ryan's vehicle came into view. Bearing gifts of chickens and eggs, people of all ages waited to have a few words with the boy who had given them so much hope.

Since the founding of Ryan's Well Foundation in 2001, more than 990 community-led clean water projects, and 1153 latrines have been constructed, giving over one million people worldwide the power to take over their own lives. Ryan said the world can be an overwhelming place, but the key to making a difference is to ask yourself, "What am I passionate about?" And when you find it, raise your hand.



Jimmy and Ryan, then and now.

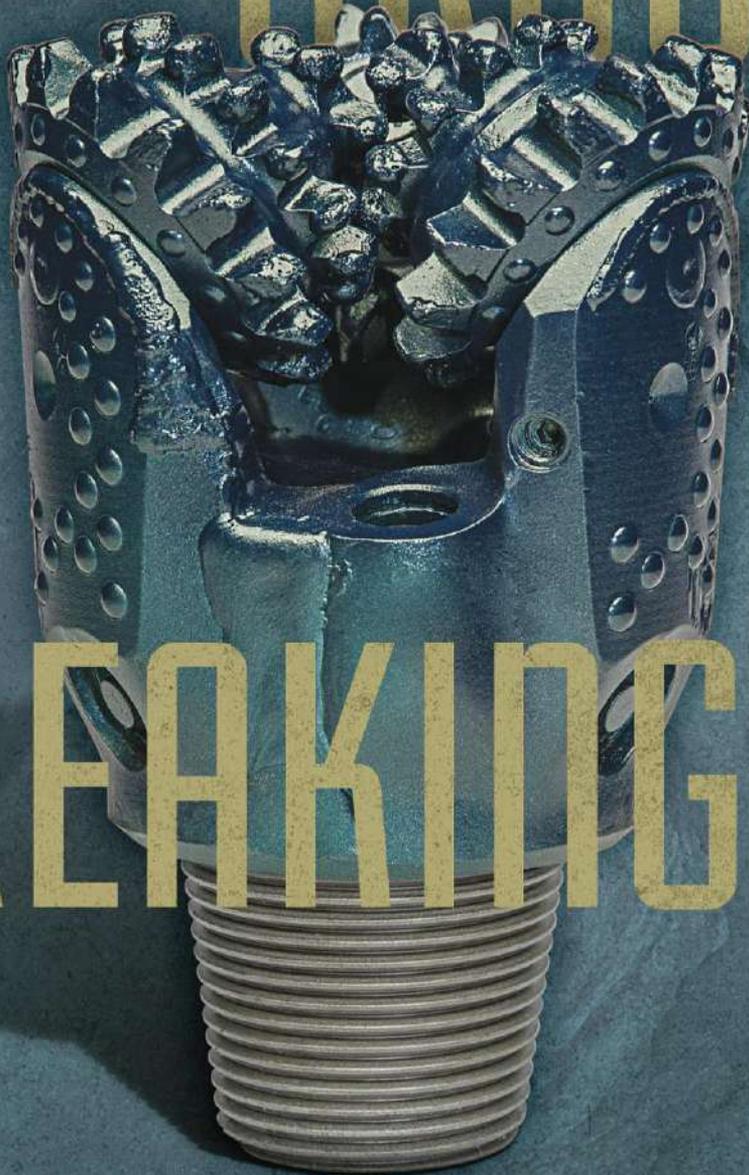


Ryan in Uganda, May 2014.



Ryan in Uganda, age 9.

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COULD GEOTHERMAL BE THE SOLUTION FOR SCOTLAND?

*Adapted from Information
Provided by edie.net*

Plans to drill a deep geothermal well beneath the city of Aberdeen could deliver heating to thousands of nearby homes and a large exhibition centre as Scotland looks to accelerate progress toward its renewable energy goals.

A Government-funded report suggested the new demonstration scheme, which would exploit geothermal energy through a pipe stretching almost 1.2 miles into the ground, could help position the region as a global energy hub and heighten the potential for geothermal development in the rest of the United Kingdom.

Aberdeen City Council said it is "willing to support" a bid to fund the scheme which would provide a reliable heat supply to local dwellings, as well as the proposed Aberdeen Exhibition and Conference Centre.

According to the latest figures from the Scottish Government, Scotland produced enough heat from renewable sources to meet an estimated 3.8% of non-electrical heat demand in 2014 - up from 1% in 2009, but still a long way from the 11% target set for 2020.

Last summer, the Scottish Government released a new policy road map detailing its approach to decarbonizing the heat system. The Heat Policy Statement outlined a number of new approaches to renewable heat, such as the designation of energy efficiency as a national infrastructure priority, and the funding of feasibility studies to investigate Scotland's geothermal energy potential.

The new Aberdeen Exhibition and Conference Centre could be the site of a geothermal well which would increase potential for further geothermal development in Scotland and the rest of the United Kingdom. Image courtesy of aberbeencity.gov.uk



The Green Investment Bank recently announced plans to upgrade a district heating scheme in northern Scotland, as well, providing a major renewables boost to the region of Caithness.

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Hi Amy,
James [Spoon] shared this very flattering article with me [*Gateway to the Gulf*, **WWD&R** April 2016, page 14]... Thanks and have a lovely day.

Melynda Wasson
Madrid Engineering Group, Inc.
Bartow, FL



Oil/Water Exploration

by Harold White

I am over at Vale, Oregon, locating underground creeks big enough to produce a thousand gallons a minute for irrigation pivot sprinklers. These underground creeks and rivers have come from a long ways away and are going to the ocean at a very fast rate. These are comparative to the Metolius River which comes out from Black Butte near Sisters, Oregon, or some of the creeks which come blasting out rock walls at Thousand Springs, Idaho.

If you want to see how fast underground creeks can move, look these places up. From studying underground water movement, I have come to the idea there is no water reserve, just a water cycle. Rain-water slowly goes down through the ground, and creeks and rivers take it out into the ocean at different levels. What I do is locate and drill them.

This study all started in Lexington, Nebraska, in approximately 1952. I did not like the idea of drilling a well someone had been dreaming of for years. How it would improve the farms, and save money for a long time to be able to pay the cost, then coming up with a dry well. It broke their hearts and their banks, and all their beautiful dreams of farming. Picture if you will, a dry farm where you can only hope the rains will save the fields from drying up and causing another failed year of work. Sometimes, this would go on year after year before they got a good year. With irrigation, the farms are beautiful and productive year after year. This is what they are dreaming of when they hire a contractor to drill an irrigation well. This is why I asked my father, "Why don't we think up a way to detect the water before we drill, so we don't have a dry well?"

If anyone can find a reserve or underground lake of nonmoving water, when you are positive you've found one, let me know. I have been searching for this for a lifetime, and been told of them, yet when I check them out, I find a place where an unusual amount of creeks are flowing. No lakes. The ocean is the reserve and has different currents.

*The statements and comments in this article are based on information and references believed to be true and factual. If you have any questions or comments, please forward them to me in care of **WWR**.*

Harold

Harold White may be contacted via e-mail to michele@worldwidedrillingresource.com

*Publisher's Note - Take heed of next month's "Publisher's Input" on articles such as these appearing in **WorldWide Drilling Resource**®, and add your input. As you know, talk is good.*

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Seven Ways to Improve Your Home Page on the Web

Adapted from Information Provided by
the U.S. Small Business Administration



Image courtesy of medithIT, flickr.com

Your website is your virtual place of business. Just like your office or shop, you want it to be neat, clean, attractive, inviting, and professional looking.

Here are seven low-cost ways to improve your website's home page to meet today's standards - and they're simple!

great idea to add a special seasonal menu to the front page. However, they didn't execute it well, and let it stay up way too long. Schedule a monthly reminder to check your website and update the home page content, or have someone do it for you.

2. Make Sure it has a Call to Action: Ask yourself: what's the top action you want visitors to your website to take? Here are three examples of common calls to action:

- Sign up for your e-mail list - When people sign up for your e-mail list, you create an ongoing connection allowing you to market to them. Most e-mail marketing software offers an easy way to insert a sign-up box.
- Shop in your e-Commerce store - If you sell products online, embed pictures of a few products on your home page to entice buyers to look through, or add a prominent "Shop Now" button.
- Fill out a lead form - If you sell services instead of products, encourage visitors to fill out a lead form with contact information so you can follow up.

3. Add Contact Information Prominently: Examine your home page objectively. Are you making visitors hunt or guess how to reach you?

Many small businesses add contact information in the header or footer of every page. At a minimum, include an e-mail address and phone number. If you receive customers at your location, add your physical address. If you'd rather use a separate "Contact" page, add a large prominent link to it.

4. Add Images and/or Video: Look at your home page. Is it text heavy? Images break up big blocks of text - and they're more inviting to visitors. Include at least one photograph showing your business, team, or products. If no one in-house is a competent photographer, invest in professional photography. In most areas, you can hire a professional photographer at rates starting at a few hundred dollars.

Videos are also excellent. Create a how-to video demonstrating your product, or of you welcoming visitors. Load it on YouTube or another video platform. Then embed the code to put it on your site.

5. Update Your Design to Current Standards: A website designed in 2005 will look dated compared to one designed in 2016. An outdated web design gives the impression your business is outdated too. It's best to update the entire website; but if time and money are in short supply, at least redesign the home page to create a great first impression. Update other pages later as time and money permits.

Contact your web developer and ask for a home page facelift. Or if you are a do-it-yourselfer, purchase a low-cost template - you can typically buy a professionally-designed template for under \$100.

6. Improve Page Speed: If your home page loads slowly, visitors may never go beyond it; and very slow pages can negatively affect rankings in search engines. Take the speed test at: <https://developers.google.com/speed/pagespeed/insights/> It's quick;

and the best part is you'll get suggestions for how to improve the speed.

7. Make it Mobile Responsive: Last but certainly not least, today's websites need to be viewable on mobile devices. This is especially true for local businesses where customers may be searching on a smartphone from their car for a business nearby. A website that is not set up for mobile devices can be negatively downgraded in search engine results. If you give your site a facelift, make sure the new design is "responsive," meaning it is responsive enough to adjust to mobile devices. The same goes if you purchase a template.

Snow and adolescence are the only problems that disappear if you ignore them long enough.

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Water for Life International

by *Tim Rasmussen*

Doyle's Drive to Guatemala Part 1

Doyle Knight shifted anxiously in his seat. He was approaching the Mexican border crossing at Brownsville, Texas, driving a large donated truck heading for Guatemala to be put in service with Water for Life. It had already been a long trip from Spokane, Washington, but there was still a long way to go. Really, the border was about the halfway point. There were three men in the truck. They made sure their passports were readily available and, for the third time, they checked all the documents for the truck and the vehicle towing behind the truck.

Crossing the border can be a difficult process. If you drive a vehicle into Mexico and let them know you intend to go entirely through the country, the Mexican authorities require a lot of paperwork. To complete the paperwork, you must hire an agent. The agent does the paperwork and makes sure all supporting documents are in order. The vehicle must be titled in the traveler's name and there must be Mexican insurance for the vehicle.

Doyle spent about four hours going through the routine to get the paperwork completed. It cost \$750. Then there was a very odd fee. It was \$250 and had to be paid in cash. There was no receipt given in exchange for the money. It sounded like a shakedown, but there was little Doyle could do. They had the power to deny him entry, and he wanted to enter. It was simple. Pay. So he paid, and they allowed him to enter. Later, he was to experience the very same thing to exit the country. A \$250 "fee".

While they were traveling down the length of Mexico, they left the coastal highway for a time. They should not have done it, because the coastal highway is patrolled with special police, and the military has a presence there to back them up. Inland is not like this at all. There are bandits, thieves, and phony police who extract tolls from unwary travelers who stray from the populated coastal highway. Doyle ran into three of these highwaymen.

The way they do it sounds like a scene from an old western movie. They drag a big branch across the road and put a chair or little table beside the road. They might have a fake badge between them, and perhaps a gun. They stop all vehicles. They usually let the cars go by, but if a truck comes which seems like it could be commercial, they "inspect" the paperwork. Believe me, they will find a "problem." Then an exorbitant figure is quoted. Next, they "negotiate" until a mutually acceptable figure is reached. It is just like being in the market, trying to buy a bunch of bananas. They have the bananas. If you want the bananas, you pay.

After four days, Doyle and the others finally made it down across Mexico. They paid the \$250 cash (with no receipt) exit fee for the truck, and put the bandits behind them.

They had not gone one mile when the Special Guatemalan Police stopped them. This was no branch-across-the-road shakedown, but a fully marked vehicle with lights, and an officer who was armed and in uniform. This was the real deal. The officer began to ask questions about who they were, where they were going, whose truck it was, who they were going to visit, how long they were going to be in Guatemala, why the truck had Washington plates, what was in the truck, and what was Water for Life, etc. They answered the questions as well as they could, and wondered what would happen next and how much the bribe would be. Only the Good Lord knew what was next. Doyle shifted anxiously in his seat.

To be continued next month.

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What's Caused Increased Methane Levels? Not Fossil Fuel Production

Adapted from a Press Release from the National Institute of Water and Atmospheric Research, Ltd

A recent study from the New Zealand-based National Institute of Water and Atmospheric Research (NIWA) indicates fossil fuel production has NOT been a major cause in the rise of methane levels in the atmosphere since 2007. Methane is a greenhouse gas and one of the major contributors to climate change. The research, led by NIWA atmospheric scientist Hinrich Schaefer, concluded the increasing levels of methane in the atmosphere are most likely due to agricultural practices.

NIWA scientists first noticed trends occurring in the data collected at NIWA's clean air monitoring stations at Baring Head in Wellington, and Arrival Heights in Antarctica. With only Southern Hemisphere data to go on, the scientists began to collaborate with the University of Colorado in the U.S., and Heidelberg University in Germany whose scientists were taking similar measurements in a number of locations across the world. "We wanted to put all the data together, then calculate the global average for each year and look at how that has changed over time," Dr. Schaefer said.

Between 1999 and 2006, scientists observed a plateau in the amount of methane in the atmosphere. The amount had been steadily increasing since preindustrial times, but leveled out for about seven years. After 2006, it began to rise again and continues to do so. Dr. Schaefer said there were three broad questions the scientists sought to answer:

Were there methane sources that diminished when the plateau began in 1999? What were they? What has been driving the renewed growth since 2006?

"We found we could distinguish three different types of methane emissions. One is the burning of organic material, such as forest fires. Another is fossil fuel production - the same processes that form natural oil and gas - and the third is formed by microbes which come from a variety of sources such as wetlands, rice paddies, and livestock."

Around the time the plateau in methane emissions occurred, economic collapse in the Soviet Union caused oil production to decline dramatically - a factor that could now be detected in atmospheric analysis, but no great surprise to the scientists.

However, analysis since 2006, rules out fossil fuel production as the source of methane increasing again. "That was a real surprise, because at that time the U.S. started [hydraulic fracturing] and we also know that the economy in Asia picked up again, and coal mining increased. However, that is not reflected in the atmosphere," Dr. Schaefer said. "Our data indicate that the source of the increase was methane produced by bacteria, of which the most likely sources are natural, such as wetlands or agricultural, for example from rice paddies or livestock... If we want to mitigate climate change, methane is an important gas to deal with. If we want to reduce methane levels, this research shows us that the big process we have to look at is agriculture."

There is also another important consideration in the mix. Naturally produced methane sources are particularly sensitive to changes in climate and, according to Dr. Schaefer, wetlands produce more methane if there is more rain and if it is warmer. Other factors to consider are thawing permafrost which also produces methane; and methane can be found in ice-like structures in ocean sediments.



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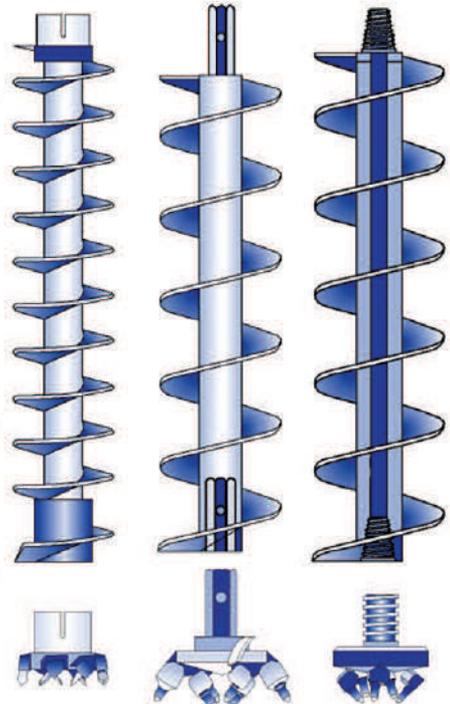
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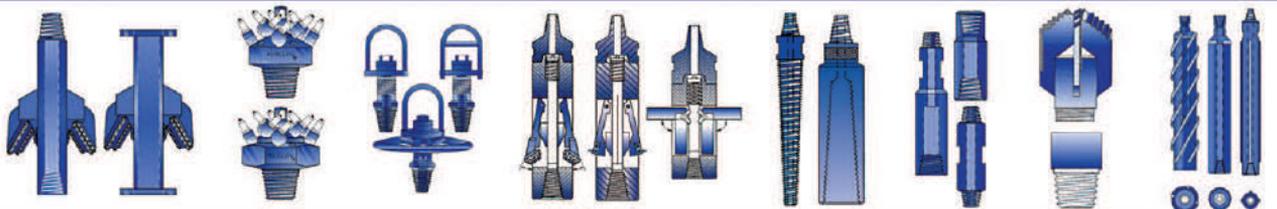
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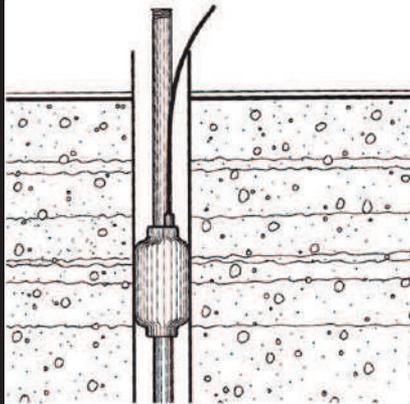


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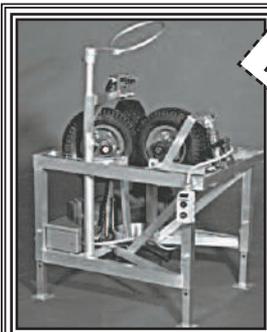
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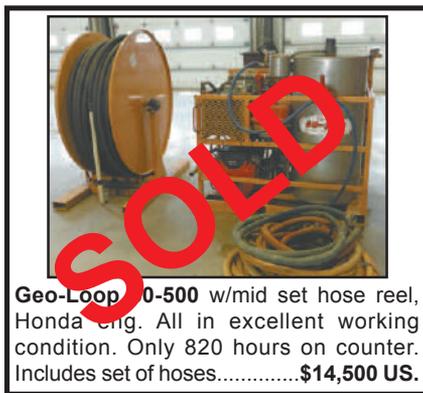
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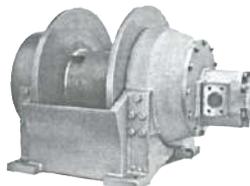
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Love Birds

by Frederick Leroy Taylor

There was an old Robin
Sitting on a bough
He wasn't much for singing,
But he tried it anyhow

There was another Robin
In another tree
She heard his melodious warbling
and flew over there to see

She perched herself upon a twig
And then tried out her voice
By a melody sweeter than honey,
She informed him of her choice

Immediately they built a nest
Then she laid her eggs there in
And when the baby birds arrived
They each one favored him

Now there's a pair of happy birds
And you can find no better
To raise a family in a nest
That they had build together





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