

SHALE



NOVEMBER/DECEMBER 2019

MAGAZINE

CLEAN AIR IS HERE,
WHETHER ACTIVISTS
WANT TO BELIEVE IT
OR NOT

HALF THE WORLD
WOULD STARVE
WITHOUT NATURAL
GAS PRODUCED
WITH FRACKING

PERMIAN
BASIN
MIDSTREAM
MIXER

TEXAS'
IMPENDING
RELIABILITY
ISSUES WITH
WIND POWER

PITFALLS OF THE
INCOMPLETE
BACKGROUND
CHECK

ALLEN GILMER

A GUY WHO KNOWS HOW

TO GET THINGS DONE

GIFT GIVING
ETIQUETTE
TO BRING
CHEER TO
THE HOLIDAY
SEASON

THE ONLY OIL AND GAS SYNDICATED NATIONAL RADIO SHOW

OIL & GAS PLAYERS | BUSINESS | TECHNOLOGY | POLICY

In the Oil Patch

Radio Show with Kym Bolado

WHERE INDUSTRY COMES TO SPEAK



We have moved to a new
bigger station in San Antonio!

Sundays
2pm-3pm
930AM
San Antonio

930 AM
THE ANSWER
BREAKING NEWS • STIMULATING TALK



Saturdays
8am-9am
KSIX
1230AM /
96.1FM /
95.1FM
Corpus Christi

sport
radio
Corpus Christi
1230 AM - 95.1 FM - 96.1 FM - SportradioBCC.com

Sundays
8pm-9pm
KFXR
1190AM /
simulcast
on the
iHeartRadio
app
Dallas
Fort Worth
Worldwide

TALK-RADIO
1190AM

Saturdays
1pm-2pm
KWEL
1070AM /
107.1FM
Midland
Odessa
Permian Basin

KWEL
AM 1070 FM 107.1

Sundays
2pm-3pm
The Answer
930AM
San Antonio
New Braunfels
San Marcos
Austin

930 AM
THE ANSWER
BREAKING NEWS • STIMULATING TALK

Sundays
8pm-9pm
KTRH
740AM /
simulcast
on the
iHeartRadio
app
Houston /
Worldwide

AM 740
KTRH
NEWSRADIO

iHeart
RADIO

HOUSTON | MIDLAND | ODESSA | AUSTIN | DALLAS | SAN ANTONIO
CORPUS CHRISTI | HOBBS, NM | LOUISIANA | MEXICO

To listen to the show: Visit shalemag.com or download iHeart mobile app to listen live!

Aggreko powers a new cryogenic gas processing facility in the Permian Basin

What does 26MW of natural gas power look like?

- Advanced SCADA system
- Custom SCR emissions control
- Reliable remote monitoring
- Certified technicians and expertise

Your engineering partner for projects of any size - anytime, anywhere



Exclusively E&P Focused on Excellence

Since becoming an independent exploration and production (E&P) company in May 2012, we have been focused solely on our core business of finding and producing oil and gas globally.

Our vision is to be the E&P company of choice by pioneering a new standard of excellence. This applies to our financial and operational performance and also to the way we do business. ConocoPhillips has a time-honored tradition of placing safety, health and environmental stewardship at the top of our operating priorities. Our technical capability, asset quality and scale, and financial strength are unmatched among independent E&P companies and uniquely position us to compete anywhere in the world. Our production includes light oil, heavy oil, oil sands, natural gas liquids, conventional natural gas, coal seam gas, tight oil and gas, and liquefied natural gas (LNG).

conocophillips.com



MOVING AMERICA'S ENERGY

The Port of Corpus Christi puts its energy into what matters most - the needs of our customers. With our proximity and connections to Eagle Ford Shale, the Permian Basin, and beyond, we are built to meet the increasing production throughout Texas and the rising demand for energy across the globe.



PORTCORPUSCHRISTI®



connect with us: portofcc.com



Call Us Today: (210) 471-1923

AutoPartsExpertsofTexas@Gmail.com

OilfieldExperts@gmail.com

OILFIELD EXPERTS is the only place in Texas that carries everything you need in the oil patch!



NTN | BOWER



POWERING PROGRESS



Grote

From **Fleet Products** to **MRO Products** and everything in between, trust us for your next major auto parts or fleet parts purchase.

- Bearings - Mounted Bearings - Hydraulic Motors -
- Hydraulic Hose and Fittings - Fluid Power Products -
- Industrial Hose and Fittings -

PLUS MANY MORE!

*Restrictions apply





The future of energy

Disruption, data, and digital technologies are shaping the future of energy. Customers, shareholders, and even employees are increasingly expecting digital innovation across all touchpoints.

Get ahead of tomorrow's challenges. We can help you innovate strategically—from design and implementation of new business models, to deployment of new IT infrastructure and automation capabilities.

www.deloitte.com/us/oilgaschemicals

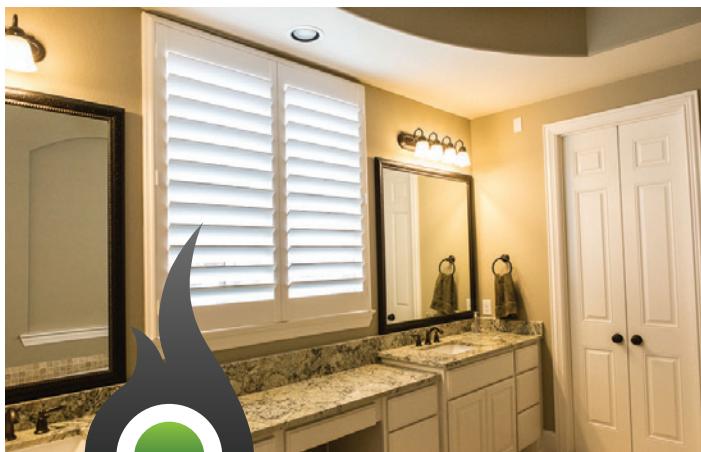
Katy Plantations

HANDCRAFTED SHUTTERS

Hardwood Shutters • Shades • Blinds • Residential & Commercial

Beautiful Windows Made Easy

Manufactured in Katy • Made of North American Lumber
Locally Owned • Competitive Pricing • Reduces Energy Costs



Direct from Manufacturer



281.402.1280 • 5346 E. 5th Street Suite D • www.katyplantations.com

CONTENTS



COVER AND TABLE CONTENTS PHOTOS COURTESY OF MICHAEL GIORDANO

INDUSTRY

- 38** Impact of SCADA in the Oil & Gas Sector
- 40** UT Protest Ironically Targets University Funding Source
- 42** Half the World Would Starve Without Natural Gas Produced With Fracking
- 44** Competing Oil Companies Work Together to Address an Urgent Need in Midland
- 46** Where Are the Women in Oil & Gas? We've Always Been Here

POLICY

- 52** Texas' Impending Reliability Issues With Wind Power
- 54** 10 Ways to Advance Produced Water Recycling and Reuse
- 56** Fracking Ban Rhetoric Sends a Chill Down the Spine

BUSINESS

- 60** Pitfalls of the Incomplete Background Check

SOCIAL

- 64** Operational Excellence in Oil & Gas Summit
- 66** Permian Basin Midstream Mixer
- 66** Houston Energy Day
- 67** Women Supporting Women
- 67** SHALE & SAPA Midstream Mixer

SHALE UPDATE

16

Shale Play Short Takes

FEATURE

18

Clean Air is Here, Whether Activists Want to Believe it or Not

COVER STORY

20

It's been a series of events that led to Allen Gilmer to start Drillinginfo, now known as Enervus. He saw an opportunity to simplify a complicated process and the company quickly grew from there. It's been an interesting journey — and it's only the beginning.

INDUSTRY

36

AI Alone Can't Address Shale, Oil and Gas Production Optimization, Predictive Maintenance

POLICY

50

Oil and Gas Opposing Views Ignore Reality

BUSINESS

58

Oil and Gas Investing Redefined

LIFESTYLE

62

Gift Giving Etiquette to Bring Cheer to the Holiday Season

KYM BOLADO
PUBLISHER / CEO

CHIEF FINANCIAL OFFICER

Deana Andrews

CHIEF OPERATING OFFICER & EDITOR-IN-CHIEF

Lauren Guerra

EDITOR
David Blackmon

ASSOCIATE EDITOR
David Porter

DESIGN DIRECTOR
Elisa G Creative

COPY EDITOR
Melissa Nichols

VICE PRESIDENT OF SALES & MARKETING
Joyce Venema

ACCOUNT EXECUTIVES
John Collins, Ashley Grimes, Doug Humphreys, Matt Reed

ONLINE CONTENT MANAGER
Walter Vlahakis

SOCIAL MEDIA DIRECTOR
Courtney Boedeker

CORRESPONDENT WESTERN REGION
Raymond Bolado

CONTRIBUTING WRITERS

Leslie Beyer, David Blackmon, Bette Grande, Lauren Guerra, Annette Heng, Mary J. Hutzler, Matt Jaye, Bill Keffer, Francois Laborie, Blythe Lyons, David Nabhan, Thomas Shepstone, John Tintera, Kylie Wright, Jay R. Young

STAFF PHOTOGRAPHER
Malcolm Perez

CONTRIBUTING PHOTOGRAPHER
Michael Giordano

EDITORIAL INTERN
LeAnna Castro



www.shalemag.com

For advertising information, please call 210.240.7188
or email kym@shalemag.com.

For editorial comments and suggestions,
please email lauren@shalemag.com.

SHALE MAGAZINE OFFICE:
5150 Broadway St., Suite 493, San Antonio, Texas 78209
For general inquiries, call 210.240.7188.

Copyright © 2019 Shale Magazine. All rights reserved. Reproduction without the expressed written permission of the publisher is prohibited.



Find Quality Jobs.
Find Skilled Employees.

End your search on **shalemag.com**



TRAIN ELEVATE NETWORK

The go-to resource for oilfield service providers, suppliers and manufacturers.



Get connected at PESA.org.



AS THE HOLIDAY SEASON APPROACHES, WE PREPARE FOR THE END OF ANOTHER GREAT YEAR AT SHALE.

As always it is has been a pleasure to share energy news and expert opinions with you, our readers. It's been a very busy year in energy and 2020 looks like it will be another great year for energy and for SHALE.

We have been quite busy in 2019, revamping our digital marketing and website has been at the top of the goals list. As we finish the year, we see those efforts really coming together to give our clients and our writers the best opportunity to be seen.

This year has also seen an increase in events from the company. Continue to expect events from us in various markets, as we continue to promote synergy within the energy and business communities.

We hope you enjoy this last 2019 edition of SHALE Magazine. Stay tuned with us on shalemag.com, on Facebook and Twitter and on In the Oil Patch radio show.

KYM BOLANDO
CEO/Publisher of SHALE Magazine
kym@shalemag.com



SandBox™
LOGISTICS

EFFICIENCY. CUBED.

TIME TO
DRAW
A LINE
IN THE
SAND.

CLEANER, SAFER,
MORE EFFICIENT
PROPPANT LOGISTICS.
FROM HERE ON.



With our proprietary delivery process and containerization solution, SandBox lowers costs, increases operational efficiency, and drastically reduces the health and safety impact of silica dust on your jobsite.

shale@sandboxlogistics.com

Visit us at DUG Eagle Ford booth # 3029 or call 832-791-3783 to learn more now.

sandboxlogistics.com



The All-New Viking VI. The World's First True 6-Person SxS.

Nobody works harder than you. So why settle for anything less than the hardest working, most durable SxS on earth? The all-new Viking™ VI features the industry's most durable drivetrain, exclusive Ultramatic® transmission with all-wheel downhill engine braking, On-Command® 4WD with fully-locked 4WD, class-leading comfort and cabin room, plus so much more. The all-new Viking VI: as reliable and indestructible as you.



**REAL
WORLD
TOUGH.**



BUILT FOR THE HARDEST WORKING PEOPLE ON EARTH.



To see Viking VI in action scan:



@YamahaOutdoors

@YamahaMotorUSA



For your nearest Pro Yamaha dealer and to learn more about the all-new Viking VI, visit YamahaViking.com

YAMAHA
Rev's Your Heart™

Most durable drivetrain claim based on a 2013 Yamaha sourced SxS owner study. Yamaha SxS owners reported fewer CVT/belt drivetrain problems than competitive owners. - Always protect the environment and wear your seat belt, helmet, eye protection and protective clothing. Read the owner's manual and product warning labels before operation. Viking VI shown with optional accessories on private property. ©2014 Yamaha Motor Corporation, U.S.A. All rights reserved.

MOBILE ICE TRAILER



- 5000 lbs of ice per day
- Lockable for security
- Great for temporary locations
- Delivered anywhere in the Continental US
- Custom options available



Call today for a FREE quote!

979-543-9039

michaelk@elcamporefrigeration.com

**El Campo Refrigeration
& Restaurant Supply, Inc.**

www.ecrefrigeration.com



**BEST WESTERN
SAN ISIDRO INN**



- Early morning complimentary full breakfast buffet
- Ultra-luxurious 300 count sheets and pillow top mattresses
- Complimentary Wi - Fi
- Prestigious M. K. Guertin Award winner - 3 years in a row
- Best Western Customer Care Champions Award - 4 years in a row
- Video and security monitored property

**LOS AGAVES
CONFERENCE AND
MEETING ROOM**



- 70" Smartboard Touch Tablet HD Display
- BOSE In-ceiling sub woofer with Amplifier
- YAMAHA Multi Channel 3D Ready Receiver with HDMI Input
- Epson Pro 3 LCD Projector
- Caterer ready kitchen with full services
- Cinema 130" motorized ceiling screen

1410 Hospitality Drive
Laredo, Texas, 78045



Phone: 956.723.1600
Fax: 956.723.1610
www.bestwesterntexas.com

**TEAC is an advocacy group that supports
the oil and gas industry.**

**Make your voice be heard loud and
clear by lawmakers by being an
energy advocate.**

**Our energy chamber is the
only group in Texas with
a focus on uniting the
energy and business
communities
in Texas!**



**Texas Energy
Advocates Coalition**

Get involved. Get engaged.

Sign up with TEAC for FREE today:

Txenergyadvocates.com



SHALE PLAY SHORT TAKES

By: David Blackmon

Bakken Shale – North Dakota/Montana

With an eye towards taking greater advantage of the massive amount of natural gas liquids being produced in the state from Bakken Shale wells, the North Dakota Industrial Commission is considering commissioning a study by the University of North Dakota's Energy & Environmental Research Center to examine how the chemical makeup of natural gas liquids changes over the life of an oil well. Advocates say that such a study would offer insight into whether the extracted gas becomes richer or experiences a drop in liquids as time progresses. The findings could then be used as part of a program to attract investments in North Dakota by petrochemical companies, who have made massive investments in new plants and equipment in states like Texas, Louisiana and Pennsylvania in recent years.

Gov. Doug Burgum indicated he would support the study. "Part of the reason for why this study would be super important is that if we're going to attract additional gas processing or pet-chem investment in our state, they need to know that there's a gas resource here that would warrant them making an investment," he said.

Denver/Julesberg (DJ) Basin - Colorado

A new study by the Colorado Department of Public Health and Environment found that people living within 2,000 feet of drilling operations "might" face a higher risk of short-term health impacts from emissions of benzene, a known cancer-causing chemical, and other substances in worst-case scenarios. The study found no long-term impacts to public health, or of any benzene concentrations that rose above safe levels defined by the EPA, nor did it take into account the improvements in emissions control equipment since 2014-15, which was the period of time its data was based upon. Despite that, the Colorado Oil and Gas Commission is using the study results as a reason to expand the scope of proposed oil and gas sites that will get additional review while the rules are being developed.

Permian Basin – Texas/New Mexico

Despite current conventional wisdom in the media and investor community that the Permian Basin is slowing down, Chevron CEO Mike Wirth told the Midland Reporter-Telegram in October that his company remains in full speed ahead mode in the region. While independent producers were receiving most of the media's notice in the first several years of the Permian boom, Wirth said, "We were planning — planning well design, well spacing, completion design, making sure there was gathering infrastructure, takeaway infrastructure, ensuring operational performance and safety performance."

"It's in our DNA to run a large operation with high efficiency and integrity," he added. "Our goal is generating strong financial returns, not high initial potentials or long laterals."

On its second quarter, 2019 earnings call, Chevron noted that its Permian oil production rose 150,000 barrels, or 55%, to 421,000 barrels compared to the second quarter of 2018.

Eagle Ford Shale – Texas

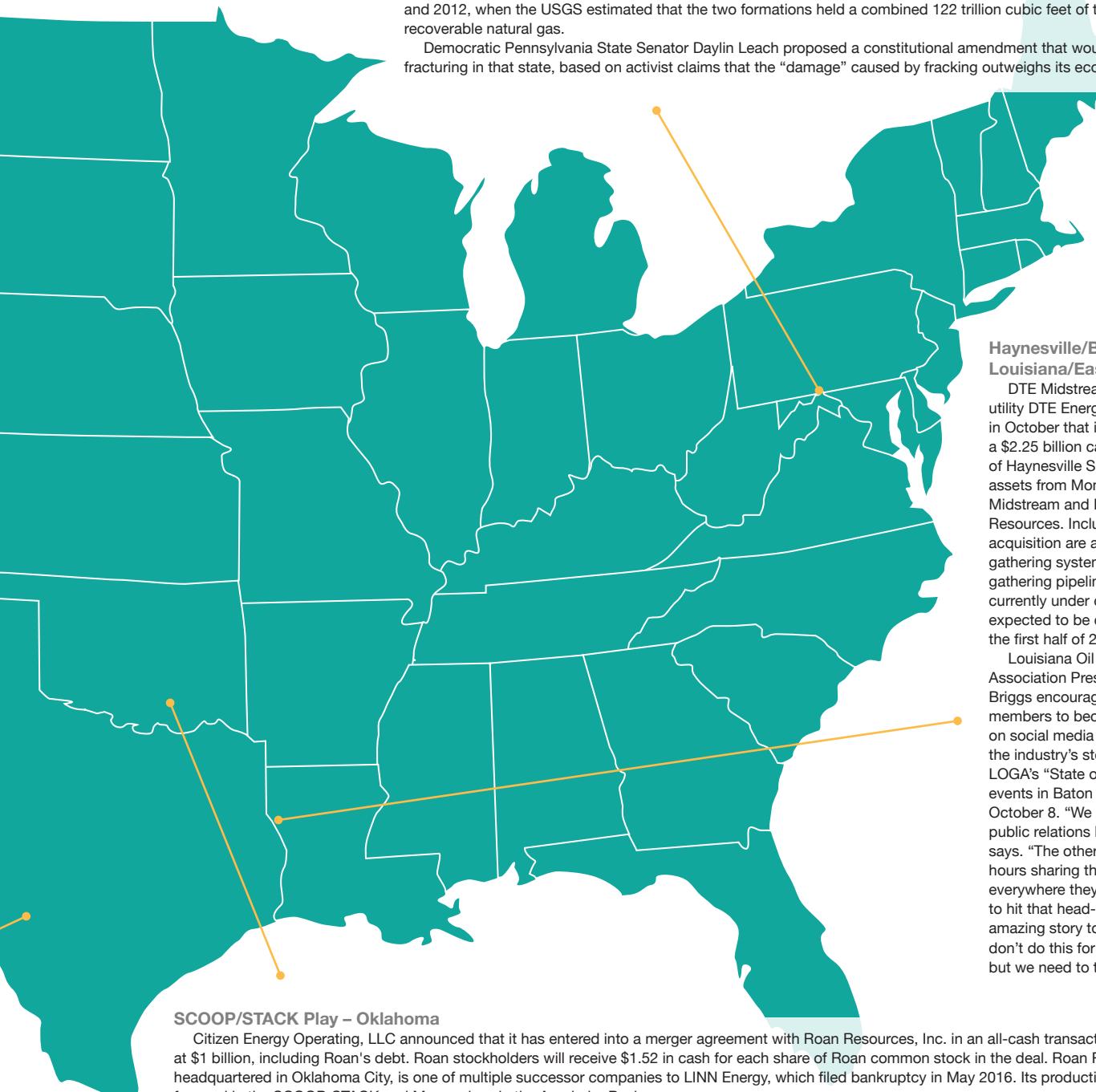
Enterprise Products Partners announced in October that it secured long-term agreements with oil producers to support an expansion of its system connecting a 6-million-barrel storage facility in Midland to the company's ECHO Terminal near Houston in the northeastern extent of the Eagle Ford region. The pipeline, which will carry crude from both the Permian Basin and the Eagle Ford region, will have a daily capacity of 450,000 barrels and could be expanded to 540,000 barrels per day.

EP Energy, a significant producer in the Eagle Ford since 2010, announced in early October that it would file for Chapter 11 bankruptcy protection. EP Energy was created as a spin-out during the 2012 merger between Kinder Morgan and El Paso Corporation.

Marcellus/Utica Shale – Pennsylvania/West Virginia/Ohio

In a newly-updated estimate, the USGS now projects that the Marcellus Shale and Point Pleasant-Utica Shale formations of the Appalachian Basin contain an estimated mean of 214 trillion cubic feet of undiscovered, technically recoverable continuous resources of natural gas. This is a massive increase from assessments conducted in 2011 and 2012, when the USGS estimated that the two formations held a combined 122 trillion cubic feet of technically recoverable natural gas.

Democratic Pennsylvania State Senator Daylin Leach proposed a constitutional amendment that would ban hydraulic fracturing in that state, based on activist claims that the "damage" caused by fracking outweighs its economic benefits.



Haynesville/Bossier Play – Louisiana/East Texas

DTE Midstream, a unit of U.S. utility DTE Energy, announced in October that it had agreed to a \$2.25 billion cash acquisition of Haynesville Shale midstream assets from Momentum Midstream and Indigo Natural Resources. Included in the acquisition are an existing gathering system and a 150-mile gathering pipeline, which is currently under construction and expected to be commissioned in the first half of 2020.

Louisiana Oil & Gas Association President Gifford Briggs encouraged LOGA members to become more active on social media and to "tell the industry's story" at one of LOGA's "State of the Industry" events in Baton Rouge on October 8. "We are losing the public relations battle," Briggs says. "The other side spends hours sharing their message everywhere they can. We have to hit that head-on. We have an amazing story to tell. I know you don't do this for the accolades, but we need to tell that story."

SCOOP/STACK Play – Oklahoma

Citizen Energy Operating, LLC announced that it has entered into a merger agreement with Roan Resources, Inc. in an all-cash transaction valued at \$1 billion, including Roan's debt. Roan stockholders will receive \$1.52 in cash for each share of Roan common stock in the deal. Roan Resources, headquartered in Oklahoma City, is one of multiple successor companies to LINN Energy, which filed bankruptcy in May 2016. Its production areas are focused in the SCOOP, STACK and Merge plays in the Anadarko Basin.

In early October, Bison, Oklahoma's largest water infrastructure, logistics and solutions provider, announced it had acquired the water management assets of Tapstone Energy. The two companies also entered into long-term agreements in which Bison will exclusively manage all of Tapstone's produced water infrastructure and water hauling logistics, including any future acreage acquired or operated by Tapstone within a 2.6 million-acre swath of the play area across the Northwestern part of the Anadarko Basin.



About the author: David Blackmon is the Editor of SHALE Oil & Gas Business Magazine. He previously spent 37 years in the oil and natural gas industry in a variety of roles — the last 22 years engaging in public policy issues at the state and national levels. Contact David Blackmon at editor@shalemag.com.



Clean Air is Here, Whether Activists Want to Believe it or Not

By: Thomas Shepstone

The EPA came out with an online report titled simply “Our Nation’s Air.” It should make all environmentalists smile. It won’t, of course. Too many of the more extreme members of that group today want issues more than they desire real progress. Yet, the data is undeniable; clean air has, by any reasonable real-world measure, been achieved to a remarkable extent.

Here is some of the key data from the EPA report. It shows concentrations of air pollutants have dropped significantly in the U.S. since 1990 (unless otherwise indicated):

- Sulfur Dioxide (SO₂), 1-Hour, is DOWN 89%
- Lead (Pb), 3-Month Average, is DOWN 82% (from 2010 in this case)
- Carbon Monoxide (CO), 8-Hour, is DOWN 74%
- Nitrogen Dioxide (NO₂), Annual, is DOWN 57%
- Nitrogen Dioxide (NO₂), 1-Hour, is DOWN 50%
- Particulate Matter 2.5 microns (PM2.5), Annual, is DOWN 39% (from 2000)
- Particulate Matter 2.5 microns (PM2.5), 24-Hour, is DOWN 34% (from 2000)
- Particulate Matter 10 microns (PM10), 24-Hour, is DOWN 26%
- Ozone (O₃), 8-Hour, is DOWN 21%

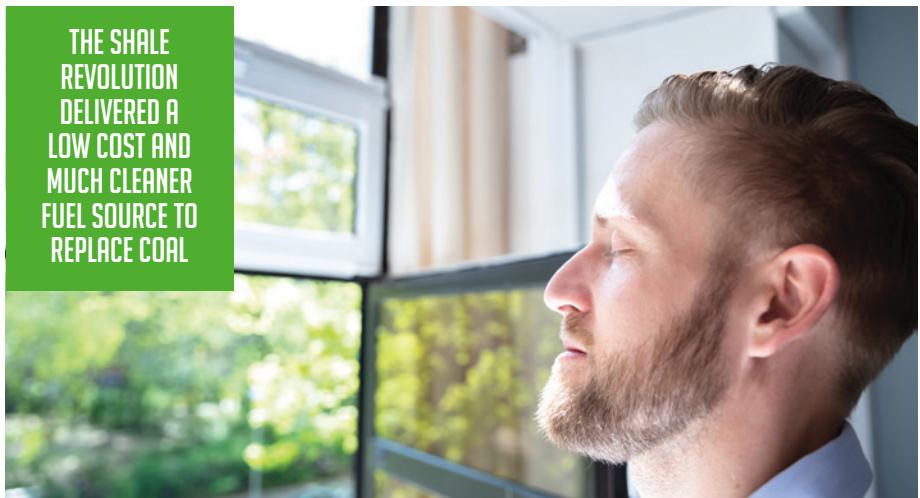
These are absolutely amazing achievements that illustrate the ability of growing capitalist economies to deliver environmental progress as contrasted with other nations. The very much entrepreneurial shale revolution is part of that progress.

The sulfur dioxide decrease, to cite just one example, can be directly contributed in large part to the impacts of the shale revolution, which allowed natural gas to be economically substituted for coal in the generation of electricity, thereby reducing SO₂ by as much as 99% in some cases.

Moreover, during this same period, the U.S. economy continued to grow. We Americans drove many more miles; our population grew, and our energy use increased.

Despite this, the total emissions of key air pollutants, like pollutant concentrations, also continued to decline from 1990 levels with the following results:

THE SHALE REVOLUTION DELIVERED A LOW COST AND MUCH CLEANER FUEL SOURCE TO REPLACE COAL



- Sulfur Dioxide (SO₂), is DOWN 88%
- Carbon Monoxide (CO), is DOWN 67%
- Nitrogen Oxides (NO_x), is DOWN 59%
- Volatile Organic Compounds (VOC), is DOWN 42%
- Direct Particulate Matter 2.5 microns (PM2.5), is DOWN 30%
- Direct Particulate Matter 10 microns (PM10), is DOWN 25%
- Ammonia (NH₃), is DOWN 22%

In addition, from 1990 to 2014 emissions of air toxics declined by an incredible 68% due to a combination of regulations and innovation.

Between 1970 and 2018, the combined emissions of the six common pollutants (PM2.5 and PM10, SO₂, NO_x, VOCs, CO and Pb) dropped by a stunning 74%. Once again, significant credit for the great results goes to natural gas substitution for coal.

A wonderful illustration of the impact of this dynamic is offered by the Hunlock Creek Energy Center in Luzerne County, Pennsylvania — once the heart of the Anthracite Coal region.

A 50-year old coal-powered electrical generating plant was converted by UGI to run on natural gas using combined-cycle technology that also recovers waste heat to generate additional power. The plant's generating capacity more than doubled, but here is what happened environmentally:

- NO_x emissions dropped from 495 tons in 2006 to 30.6 tons in 2012. That was a 464.4 ton or 93.8% reduction.
- Sulphur Dioxide emissions at the same facility went from 4,405.3 tons in 2006 to 0.9 tons in 2012. That was a 99.98% reduction.
- Particulate matter under 2.5 microns in size (the world's biggest air pollution issue) was reduced from 211.693 tons in 2006 to 3.5 tons in 2012. That was a 98.3% reduction.
- Carbon Monoxide decreased from 42.3 tons in 2006 to 6.6 tons in 2012. That was an 84.4% reduction.

- Volatile organic compounds (VOCs) went from 5.1 tons in 2006 to 0.1 tons in 2012. That was a 98.0% reduction.

There is also the matter of “good air” days. EPA uses an Air Quality Index to assess how many such days there are per year. Tabulating the percentages of good air days for 2008 as compared to 2016 (the heart of the shale revolution), indicates that while natural gas consumption went up dramatically in the Northeast (10% in New York, 25% in New Jersey and a whopping 54% in Pennsylvania for a combined 27% increase), the percentage of good air days went up. They went from 75% to 88% in New York, 66% to 76% in New Jersey and from 65% to 74% in Pennsylvania.

This clean air progress is simply staggering, and it has only gotten better since Hunlock Creek was upgraded. These concrete results go directly against the prevailing sentiments of fractivists and other enviros who want to be able to proclaim disaster at every turn for purposes of their own special interest agendas.

Sentiment is always thus: based on feelings, emotions and everything but facts. The facts, though, as noted above, are simply undeniable. The shale revolution delivered a low cost and much cleaner fuel source to replace coal. It has served to vastly reduce air pollution from generating electricity, but that's not all.

The revolution in power generation wrought by shale development also let the U.S. reduce Carbon Dioxide (CO₂) emissions faster and further than virtually anyone else. Indeed, here is what Penn State University, relying upon EPA data, had to say in 2017 about CO₂ and CH₄ (Methane) emissions in the Northeast:

Over the past five years in the Appalachian Basin (the Eastern Overthrust Area per EPA's reports), while natural gas production increased dramatically, the CO₂ and CH₄ emissions have decreased. This may be attributed to the conversion of many power plants from coal to natural gas as well as increased monitoring and technology efficiency.

Whether CO₂ is a pollutant or not is, appropriately, a debate for another day. What matters for our discussion here is that we have reduced our emissions in a major way with whatever that portends for climate change, making shale gas something all sides should be able to agree upon — even if we don't. This is especially so, given the accompanying reductions in almost all other major air pollutants; declines we can all applaud.



About the author: Tom Shepstone is the owner of Shepstone Management Company Inc., a planning and research consulting firm located in northeastern Pennsylvania. He has advised many counties in both New York state and Pennsylvania, as well as other states, on economic development strategies, especially as they relate to rural and agricultural areas. He is also the publisher of NaturalGasNOW.org, a blog focused on the same objective.



ONLY TEXANS KNOW HOW TO FEED TEXANS

Reaping the earth's bounty is what we do best. That's why you should plan your next offsite onsite by catering with Freebirds. From custom-rolled burritos to an entire burrito bar, your folks will attend this meeting and even look forward to the next.

Place your order now.

Freebirds World Burrito
San Antonio & South Texas
Catering Sales Manager
Josie Nieves

P: 210-560-5002

F: 866-421-0876

jnieves@freebirds.com



COVER
STORY



ALLEN GILMER

A GUY WHO KNOWS HOW
TO GET THINGS DONE

By: David Blackmon



"The lady that ran the courthouse was named 'Peaches'"

"We focused on Texas only, and we covered things we could get from the Railroad Commission. So, that was production data back to 1970. Then there were permits and completions. Permits, we collected daily, because we were located there in Austin, so we could just go up there and get permits every day. We also collected completions daily, but that wasn't as important because of the lag times involved.

"Then the other element was leasing activity. That was something no one had ever tried to do before. That involved us literally going and driving to courthouses all over the state, looking up the indexes and seeing what people had done since we had last been there. We would locate the leases to the abstract level, but we weren't at that point trying to map them."

Allen Gilmer, the co-founder, former CEO and current Executive Chairman of Enverus, is talking about the company's original suite of data offerings when it started operations 20 years ago, under the name of Drillinginfo. Those who have become familiar with the oil and gas industry in recent years probably won't realize it, but what Gilmer is detailing in those two paragraphs represented a transformational, game-changing event for independent producers in 1999, and later for the biggest companies in the business.

I had personally been in the industry since 1979 and first ran into Allen at a trade association (TIPRO) conference in Fort Worth in 2000, where he was giving a presentation about his new company. Having been involved in the collection and analysis of the very data elements described above, and knowing how cumbersome and labor-intensive it was for any company to obtain them, I understood then that Gilmer and his partners had a product that would provide tremendous benefit to any company.

Prior to DrillingInfo's founding, the permitting, completions and production data Gilmer refers to could be obtained on request, either by fax, postal mail, e-mail (which was only then coming into common use) or by sending an employee to Austin to collect it in person at the headquarters of the Texas Railroad Commission. But the Commission's records had yet to be digitized, so the hard copies you could obtain would then have to be taken back to your home offices, where the data contained in them would have to be manually entered into your computer databases. Drillinginfo put them on a map, on the internet, at a time where a page wasn't bigger than 40 kb, and access was slow and over a telephone modem.

As Gilmer pointed out, obtaining the leasing data was even harder, because that information was filed by the lessors at the county courthouses of Texas, and Texas is home to 254 counties, more than any state in the nation. Plus, Texas is a big place — 832 miles from Port Arthur to El Paso, 861 miles from Dalhart to Brownsville — so big that many companies employed landmen who were on the road as much as 90% of the time.

Which is why, as Gilmer explained to us when we interviewed him in early October, most companies doing business in Texas found themselves to be range-bound.

"When we started this business," he said, "if you were an independent oil and gas company, unless you were one of the largest like a Samson or a TXO or somebody like that, you worked an area. You worked the panhandle of Texas; you worked West Texas; you worked Railroad Commission District 3 or 4. You worked just a small area because that's what you knew. You didn't really know all the pieces in all the other places. As a result, you didn't really have an understanding whether you were or weren't spending your most precious commodity, which is your time, in the best places to make money in the business."

Gilmer credits his background in the seismic business, more on that later, as the experience that helped germinate the idea in his mind. "At some point when I was doing the seismic stuff, it hit me like a hammer," he said, "because we'd have to figure out where we were going to need seismic crews, what projects we were going to undertake, what were the well economics, all over the U.S., and all this other stuff. And all of these things just weren't easily available."

It was shortly after that that he got together with his partners — Mark Nibbleink, Bill Fowler and Martin Payne — to begin the work of forming Drillinginfo. "Mark had the original idea, putting drilling permits on a map. From that seed, we took off. We were all independent oil and gas guys, and looked at what it is that we needed to know before we could go out there and make a decision whether or not to go forward on a project," he said. "At the time we were doing this, small companies wouldn't even look at a project outside of the geographical area they worked in.

"So, our goal was to figure out how we reduce the size of that first step down to the point where you'd even look at a deal. And that was what we first went to market with."

Gilmer laughed when he talked about the company's initial marketing strategy. "Between us all, we knew a couple thousand people. So, we called them all up and told them what we were doing, and they all loved it. And if they didn't love it, well, now they had to have it because everybody else was going to know what they were doing."

Rather than trying to hit 254 county courthouses every month, Drillinginfo's initial strategy on collecting lease filing data was to focus on the counties in which there were filings for new drilling permits. That was because, as Gilmer pointed out, "leasing activity generally pre-sages permit filings."

He and his partners would also try to collect as much information as they could over the phone, but many county courthouses weren't overly cooperative to that approach, especially when their halls were often filled with company landmen waiting to get access to their files. Gilmer told a funny story about one courthouse employee who was positively aggressive about it all.

BECAUSE GILMER AND HIS PARTNERS WERE ALL INDEPENDENT PRODUCERS THEMSELVES, THEIR ORIGINAL VISION WAS TO CREATE A SERVICE COMPANY THAT WOULD FILL THE NEEDS OF COMPANIES LIKE THEIR OWN, AND THOSE PRODUCERS BECAME THE INITIAL TARGET MARKET

"I remember there was one county seat in East Texas, the lady that ran the courthouse was named 'Peaches,'" he said, smiling. "And Peaches once locked our guy in the courthouse basement overnight. Frankly, there are all sorts of fun stories about driving around the state of Texas."



"Exxon called us up one day—we thought it was a practical joke."

Because Gilmer and his partners were all independent producers themselves, their original vision was to create a service company that would fill the needs of companies like their own, and those producers became the initial target market. After all, the big companies had whole departments full of people whose jobs it was to collect, collate and digitize all of this

information and make it usable for the rest of their employees and management.

But it didn't take long before larger companies came calling. "Our first bigger client was Dominion Oil and Gas," Gilmer remembered. "Ron Gonzalves, the VP of Exploration there was the first guy to write a bigger check for a bigger company — this was just a couple of years after we got started.

"I remember asking him, Mr. Gonzalves, you probably have all this data elsewhere in your databases, and you spend millions of dollars to collect all this stuff in-house every year. Why did you decide to take this subscription? He said, 'If I have a question I need answered, I can go into your product and get it answered in 2 minutes. Otherwise, I'm going to have to set up projects to take a technical professional to do this, and I might get an answer in a day.'"

For Drillinginfo, signing a deal with Dominion was like catching your first 25-pound redfish. It was an event that led the company into a new, bigger target market. And it wasn't long before the company got a nibble from the legendary "big one."

"Exxon called us up one day — we thought it was a practical joke, to be honest," Gilmer says with a laugh. "But they called us up and asked us to come to Houston to demo our product at one of their buildings there at the time. That's like being a guy in high school in 1976 and having Farah Fawcett call you.

"So, we were like, yeah, sure, who is this really?" he laughed again. "But it truly was Exxon, and what had happened was a case where they owned the minerals that were immediately offset to the biggest gas well drilled in the United States at the time. That was down in Brooks County. Exxon owned the minerals in the lease next door to it, but they didn't have any active exploration in the area, and there was no real way of bringing it to your attention before the other operator had drilled that well if you weren't specifically looking for it.

"And Exxon calculated that they had lost about a quarter of a billion dollars through drainage before they figured out that someone had drilled next to their fee. So, that was what they were trying to address, and we were the system that allowed them to address it. That was our first real breakthrough."

Looking back on it all from his perspective 20 years later, Gilmer said he still finds great value in periodically reviewing the company's original business plan. "I open up the old, original business plan for the company and read it again every year, because we still have not achieved all of the things we thought we could accomplish. We've achieved some things far beyond what I'd imagined we could do, but there are still certain things that we have not."

Given the way the company has evolved into offering one of the most robust and diverse portfolios of services in the business, that's hard to imagine.



"I am here right now because of a light-green Camaro Berlinetta."

Growing up in the 1960s and 1970s in a middle-class family in El Paso, it would have been hard for a young Gilmer to ever imagine he would end up becoming the CEO and Chairman of such a large and successful company.

"El Paso has always been this interesting place that is out of place and time. It's closer to two or three other state capitals than it is to Austin. So, it's really an island," Gilmer began, as he reflected on those younger years.

"This has always been an interesting city," he continued. "The people who came here came to chase the American dream. It's a true multi-cultural city where everyone gets along. What everyone has in common is a sense of tradition and family, and they were what I'd consider to be a true example of a multicultural 'Ozzie and Harriett' world, and that's the world I was lucky enough to grow up in."

Like so many mothers during those years, Gilmer's mother was a home-maker. His father was a civil engineer who had attended The University of Texas in Austin for a year after serving in World War II, and then transferred back to his home town of El Paso to finish up at the former Texas College of Mines, which had just been re-named Texas Western College. In 1967, Texas Western became part of The University of Texas System, and was renamed The University of Texas at El Paso, or UTEP.

As fortune would have it, Gilmer's father, after earning his civil engineering degree, got a job in the oil business. "He went to work for El Paso Natural Gas, which was a great employer here in El Paso for many years," Gilmer said. "He worked as a pipeliner. His first job was to go out to build the Caprock compression station between Tatum and Roswell, NM.

"Dad would tell us, 'Lord, I didn't know what I was doing when they sent me out there. Thank God there was a guy that had 30 years experience and no college degree there to help save my butt. Without him, I don't know what I'd have done,'" Gilmer said with a laugh. That was a lesson that Gilmer himself would learn early in his own career.

Upon graduating from high school in El Paso, Gilmer found himself choosing between going to college on the East Coast, or attending Rice University in Houston. As it turned out, his new car made that decision for him.

"I left El Paso to attend Rice University for my undergrad, primarily because my parents said I couldn't take my brand new, hideous light-green Camaro Berlinetta if I went to the East Coast, which was my other option. You see, I had worked all my high school years to be able to go buy that car.

"It was a truly horrible shade of green, a light green, maybe the only one ever made. Miami Vice was hot at the time — that was my only excuse. All my friends at Rice learned to love it and laugh at it, and I can't imagine what the road not taken would have been had it not been for that damn car.

"So, I have to say that I am here right now because of a light-green Camaro Berlinetta."

Gilmer initially entered college with ambitions of becoming a lawyer, but quickly discovered that the process of obtaining a law degree involved having to study all manner of subjects in which he had little interest.

"I took political science, and I took philosophy of the law, and like a very good liberal arts major trying to get through their science requirements, I took "rocks for jocks" — geology — because that was kind of the easiest of the introductory sciences," he began. "What I found was that I hated political science, and I didn't like philosophy, and I was just lost in all of these kinds of subjective topics. We took a field trip during my freshman year to Inks Lake, and one of my geology professors drank a bottle of Jack Daniels and passed out, and as we were pulling his inert body away from the campfire I thought to myself, 'I can do this! This is in my wheelhouse,'" he said with a big laugh.

"So I became a geologist, and, you know, geology is the biggest bait and switch major there is, because they sucker you in with fossils and cavemen and dinosaurs and really cool stuff like that, and then they turn around and hit you with optics and physics and stress and strain and all this other stuff you thought you might avoid by going into geology. But it was a fantastic experience, and I met lots of great people who are still friends to this day."

When Gilmer entered college at Rice in 1979, the entry-level degree for a geologist coming into the oil and gas industry was a bachelor of science degree, and the industry was burning hot. But by the time he finished his undergraduate work, a master's degree had become the standard, and the industry had cooled considerably. So, he packed his things into his infamous car and drove home to El Paso, where he would seek his master's degree at UTEP.

PRIOR TO DRILLINGINFO'S FOUNDING, THE PERMITTING, COMPLETIONS AND PRODUCTION DATA GILMER REFERS TO COULD BE OBTAINED ON REQUEST, EITHER BY FAX, POSTAL MAIL, E-MAIL (WHICH WAS ONLY THEN COMING INTO COMMON USE) OR BY SENDING AN EMPLOYEE TO AUSTIN TO COLLECT IT IN PERSON AT THE HEADQUARTERS OF THE TEXAS RAILROAD COMMISSION



"I FOUND OUT RIGHT AWAY THAT YOU'D BETTER BE DOING THINGS THAT OTHER PEOPLE VALUE."



"As far as I can tell, gold mines are a hell of a lot of work."

In keeping with what would become a life-long pattern, Gilmer chose to study at UTEP because he wanted to more fully understand the full systems of how things worked, and he wanted to have as much control as possible over his own destiny.

"The reason I chose UT El Paso was not so much because it was my home town," he said. "I knew from the start that I wanted to go into the oil business, but I also wanted to understand things better. I wanted to understand mining, and I wanted to understand the economic resources.

"One of the frustrating things to me at Rice was, we would go out onto our field trips, and here we'd be in Nevada or somewhere else in the Western United

States, and there would be a tunnel that was dug by somebody 100 years ago into the side of a mountain with no clear reason why they did that. You're looking at that thinking, wow, that was a major amount of work. I remember going home and telling my Dad, don't ever tell me that something can be a 'gold mine' because as far as I can tell, gold mines are a hell of a lot of work.

"So, I didn't understand all of that, and I really wanted to understand it. I wanted to understand the systems. I had a basic understanding of petroleum systems and mineral systems, and that has served me well over the years because a lot of the things we're talking about today are fungible. You know, if we're going to make the foolish decisions to not use oil and gas, then we're going to have to go mine other strategic minerals, and there's no getting around these things."

UTEP provided the young Gilmer with a better opportunity to be in greater control of gaining this full, systemic understanding and allowed him to be largely self-directed in choosing his projects. Gilmer gives a large part of his ability to ensure that his graduate school experience would set him up to succeed in the business world to one of his key professors.

"My professor was a British gentleman who went to 'uni' at Durham, and who everyone was afraid to have as a teacher. He was a dot the i and cross the t guy," Gilmer said. "And I really needed that discipline, so I sought him out as my thesis advisor. He's a fantastic man. His name is Dr. Kenneth Clark. He's still alive and retired, and he was an amazing mentor for me in graduate school, in forcing me to be much more disciplined than I was. He was working heavily in Mexico, and has been a huge contributor to the understanding of the economic geology of Mexico.

"I went to UTEP in part because I wanted to work in Mexico," Gilmer continued. "It was interesting because we didn't have a lot of funding in that university. You had to go find your own project, you had to figure out how to get it partially funded by various different groups.

"Alternatively, if I had gone to, say, UT-Austin or Arizona or Stanford, all of which had amazing funding for the projects they did, as a master's student I would have had a very limited scope of work under a big project that the professor was heading up, and which had several PhDs working on the bigger, 'funner' stuff, and it would have been much more side-boarded and constrained.

"Some people are much more comfortable in that kind of a situation, and with the fact that it was all paid for. I ended up having to figure out how to pay for every bit of my subject project, but then it didn't have any constraints around it. It allowed me to go out there and take on something that was probably much more interesting and fulfilling for me than what most people look for when getting a master's degree.

"I found out right away that you'd better be doing things that other people value."



"I spread the annoyance around broadly enough so that I became sort of lovable."

When Gilmer obtained his master's degree from UTEP in 1986, the oil industry was in a deep depression, and companies were more focused on downsizing their existing workforces than they were in hiring any new graduates. As a result, Gilmer and his fellow graduates that year found it virtually impossible to even get an interview, much less an actual job offer.

"I sent out 500 letters, and my diabolical deal at the end of each of them was to close by saying, 'I'm going to call you next week to set up a mutually-agreeable appointment for me to come by and interview,'" Gilmer said, "which was an audacious thing to say since I couldn't even get to Houston at that time. I didn't have gas money."

But two companies, Marathon and Conoco, responded back to the audacious new graduate, so he was forced to figure out a way to get himself to Houston, where both companies had major offices. Luckily, both companies agreed to conduct his interviews on consecutive days and agreed to share his travel costs.

"This was a very tough time to interview," Gilmer remembered. "The day I interviewed at Conoco was the day after they had just had a lay-off, so there was a very 'interesting' dynamic in this interview. They had actually just forgotten to reschedule me, so it was a memorable day. The first interviewer asked me 'what makes you think you can come in and take the job of a good geologist?' I thought it must be some sort of interview methodology. After the day was done, the secretary apologized for having me in on that day and told me what had happened." That day didn't ultimately result in a job offer, which of course was the expectation going in.

But the next day, as Gilmer recalled, was different in several ways. "The next day was at Marathon, and my last interview was with the VP of International Exploration who told me categorically that they weren't hiring anyone that year, and he didn't understand why I was in there interviewing, but now that we had 45 minutes cut out, what did I want to talk about? So, I said, 'I want to talk about

your career, and tell me how you got into it, and what it's been like,' and we just had a really wonderful conversation about his career.

"The next morning, I was getting ready to get back on the bus to El Paso, when I got a phone call at my motel saying that they were going to make me an offer," Gilmer said. "There were only two of us that year. They had taken people who were strong in math, and they were going to see if they could make geophysicists out of geologists who had a strong math background. The other fellow who got hired that year was a fellow named Woody Pace, who ended up with an incredible career at Marathon and later, I think, at Talisman."

Gilmer began his career at Marathon at the company's research lab in Denver as a processing geophysicist for difficult seismic areas. "When you went out there to process seismic data and the commercial shops couldn't do it right, this group would process it," Gilmer said. "Thankfully, I was the only newbie in that group, because that way I could bother all these really smart guys and girls who worked there just enough so that they didn't hate me individually. I spread the annoyance around broadly enough so that I became sort of lovable." (laughing)

"It was an incredible place staffed by incredibly smart people: Bob Wylie, who is now at U of H, was over there; Wayne Pennington, who is now the Dean of Sciences at Michigan Tech; My boss,

**BUT AS IS THE CASE
WITH ANY NEW
VENTURE IN THIS
INDUSTRY, THE
ROAD TO ULTIMATE
SUCCESS WAS
FILLED WITH
PITFALLS AND
COMPLICATIONS**

Damon Simmons, just recently retired from Marathon. The people that were there, across the board, were just hugely decent people and just scary smart. And that was where I spent my first two years."

Gilmer described his next assignment at Marathon, in the Seismic Acquisition Group (SAG), as "the job every young, single geophysicist wanted to get." The group was only two or three people, and the folks in it at that time were Bill Howieson, Jeff Sposato and Mike Melon. All of them have had great careers in the business.

Gilmer's early work in the SAG focused primarily on South America where Marathon was in the early exploration phase of leases it had acquired in Argentina and Bolivia. "I learned a lot about how you got things done," he said. "You know, things are pretty simple when you're sitting at a desk and everything gets delivered to you after all this work and conditioning is done and collected. But to be on the front end gave me a huge appreciation for the supply chain, and what had to take place."

"One of the things the seismic business really taught me was that you got no credit for having a fantastic degree or being top of your class at Colorado School of Mines or wherever," he continued. "You had to get the job done, and you had to get it done quickly, and you had to do it right. Because time was essential — it was so much money."

"So, the people that I met in that business who were running seismic operations, oftentimes these guys didn't have college educations. I met several certifiable geniuses that had never had the opportunity to go to college. They were just the guys that could get it done. That was just a huge filter for me."

Ultimately, his time at Marathon provided a learning ground that helped prepare Gilmer to go into business for himself at a very surprising time in the industry.



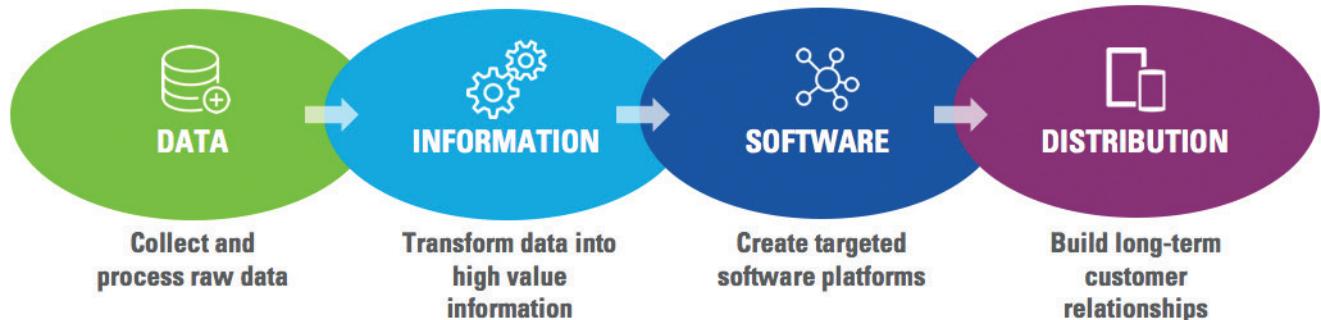
"I still remember very clearly my exit interview— they just couldn't get their head around it."

It was the early 1990s, another period of shaking out in the oil and gas industry. The world was once again awash in crude oil, and demand for natural gas in the U.S. was depressed; as a result, prices for both commodities had once again collapsed as they had in 1985-86. Companies large and small were in the midst of reducing staff and cutting costs in any way they could find.

It was at this time, when most everyone in the business was doing all they could to hang onto the jobs they were lucky to have, that Gilmer did something completely unexpected: He quit.

"Marathon, like every other company at that time, was going through one of their periodic layoffs," he recalled, "and the people I saw getting laid off were in a lot of cases guys in their 50s, had kids in college, and their lives

OUR COMPETENCIES



were being completely upended in ways I'm not sure they had planned for. In fact, I know they hadn't planned for. And no one was hiring."

He paused before continuing. "I just didn't want somebody to have that kind of power over my career. So, I started thinking about what do I know, and what could I do, and one of the things that I knew was seismic. I knew seismic data, how to collect it, how to process it and how to interpret it.

"So, I thought about quitting for about a year, year-and-a-half, thinking about what I might do. And I decided I would go be a consultant in helping people put together 3-D seismic surveys, and take a royalty as compensation rather than cash.

"So, I quit Marathon. I was the first person to quit there in years — they didn't believe I was not going to work for somebody else, that I was, in fact, leaving to go be an independent. I still remember very clearly my exit interview — they just couldn't get their head around it," he said with a chuckle.

Gilmer recalled that Marathon treated him very well during the process of his departure, and in fact, later became one of his new company's clients. But as is the case with any new venture in this industry, the road to ultimate success was filled with pitfalls and complications.

It all started with his initial business plan, which Gilmer described as being "completely messed up." It turned out that everybody wanted a 3-D seismic survey, but nobody actually wanted to pay for one. Certainly, nobody was willing to give me a royalty interest for putting one together for them.

"So, I suckered my friend Jeff Spoisato and Jamie Kieley into leaving the security of Marathon and going out with me to start up a seismic company, in which we would shoot 3-D seismic surveys in exchange for working interests — we never could get anyone to give us a royalty for them. And a working interest is its own fun experience.

"It was really stupid," he said with another big laugh. "I'd look at the working interest percentage and think, man, that's a lot bigger number than the royalty interest is. This is great. I didn't really fully grasp the bills that came with working interests after all the "carry" was gone. An old geologist friend told me when I described what we were doing, 'Oh, Al-len, a working interest is not for the working man.'" (laughing)

But ultimately, he and his partners got the business going; and, like everything else done in his career, it became a success...of a sort. "We

were ultimately successful, but the road to that success was arduous," Gilmer said. "I was running all the time. All of us had maxed-out credit cards and beat-to-hell trucks and some stories that I'm going to save for a rainy day when I need the extra cash. We can make movies out of those," he said with another laugh.

All of these life experiences and others ultimately led to the creation of Drillinginfo, a company that began as a data-accumulator service targeting small independent producers, which has now grown into one of the largest and most diverse service providers in the business.

"The opportunities that come from these kinds of complex systems moving around are immense."

As time has gone on, and Drillinginfo/Enverus has evolved and diversified as a company, the focus has been increasingly on helping clients to identify the inherent value in a property or planned project.

"That's all driven by the business plan," Gilmer said. "If you think about value in the oil and gas industry, where does value come from? Everybody knows how to go run a decline curve on a well, right? But then, how do you value a piece of land? That piece of land doesn't have a discrete value — even the well itself doesn't have that because there's so much fuzziness involved in getting to that. So, that's why we started looking at things like probabilistic analysis, where you say the well has a 50% chance of producing this, a 30% chance of producing this, a 5% chance of producing this, and so on."

"When you start looking at the front end of the process, at the land and minerals, you talk about fuzzy — there's all sorts of fuzziness there. It's largely driven by speculative value and the people having cash to go do that. So, you start with places where you can go buy stuff cheaply, but then the cost starts to elevate and there's nothing you can tie it to other than a speculative frenzy. Hopefully, at some point, the fundamentals catch up, and that piece of land and minerals becomes worth a financeable amount.

"So, we saw this, all these separate piles of information, all these silos of value that were unconnected or loosely connected, as an opportunity," he continued. "We're sitting there looking at all of that, saying, given how mushy this whole value thing is, and how difficult it is to manage with all these chaotic signals, there's a lot of opportunity to be built into identifying real value and segregating it out from a lot of the bias that's out there.

"If you look at what we've done with products like Red Dog and Oildex and others, all of a sudden the companies that are using our systems now have a dashboard for being able to identify and manage their costs. So, rather than it just being a tool to go get an invoice approved, it now becomes a dashboard that interacts with all of our other data, and any data the client cares to put into it on a proprietary basis, to help them better manage the cost-side of the equation. With over a quarter of a trillion in spend running through our systems and cutting edge technology in defining the subsurface numerically, we have, by far, the best holistic training sets for Artificial Intelligence applications in the oilpatch."

As the industry and markets continue to evolve, Enverus is increasingly focused not just on oil and natural gas, but on the various components of molecules in those commodity streams. "Today, the markets are turning to molecular markets. It used to be you'd start at WTI, and the purchaser would offer you a plus or minus off of that depending on the quality of your product. But now, the various different molecules have very different end-member uses, and very different values based off of that. So, you'll see some molecules have zero value or even negative value, and others have relatively high value.

"It's all very fascinating, and we no longer have this static market. Over the last couple of years, the United States has become a major exporter, and exporting into a global market of all of these different components is highly important. Where oil used to be a transportation fuel, now that electricity is moving into the transportation side, there are all sorts of fungible markets now competing with one another, and that's made the whole business highly-complex, and one that's becoming increasingly data-driven. The opportunities that come from these kinds of complex systems moving around are immense.

As Gilmer looks out to the future, he believes Enverus will continue to diversify along with the industry, as has always been the case. "We see as this industry and its adjacent industries are changing and rapidly evolving, that there's all sorts of white space to go into in terms of building out tools that people never thought about having," he said. "Tools that will be necessary to even take advantage of all of that white space. The proudest I've been of DrillingInfo is when we have led on that side."

Gilmer and the company's management also retain a keen focus on the needs of the clients, which vary widely. "Our client base is like most industrial client bases. We have people that are early adopters, fast-followers and the lagging adopters, and we strive to be sensitive to all of those," he said. "Our concept is that here is a company that is doing X, and if we can combine that X with some of the other things we are doing over here, then that opens up a brand new opportunity to create value out of things people had never thought about being able to do before. That's what we call 'playing in the blue water' — doing things that people haven't thought about doing before to create new value."

"When we roll a new offering out, it's NEVER 'Hey, we're going to just charge you a lot more for what you've taken in the past.' We give the client the option to keep taking what they have in the past, or to be able to be a player in this new world."

But what about that name change? It turns out that the driving factor behind the name change from DrillingInfo to Enverus was the desire by Gilmer and others to ensure the name remained descriptive of the company itself. Drillinginfo was suitable for the company's original service offerings, but a different name was needed to be descriptive of this vastly more diverse and constantly evolving enterprise.

"People are creatures of habit," Gilmer began. "I'd always felt like there was this cohort of users of Drillinginfo that really still just looked at us as production data providers. And frankly, a lot of them were using that. It was like using a Ferrari for a flower pot. The challenge for us was to go out there and say, 'We are happy to be a data provider, because this data is the gasoline of our engine.' We were glad they were doing that, but sometimes it blocked them off from really seeing everything we were doing."

"Think about some kid you knew in the first grade, and you haven't seen him in 20 or 30 years. It's really hard to picture them in any way other than what they looked like in the first grade. That's sort of like what our members thought about us as we evolved Drillinginfo. Everything they were doing was colored by what they were doing when they first adopted us."

"What we were also finding was that the clients who were coming in late to Drillinginfo were using it much more broadly and powerfully relative to our early adopters. So, we saw that as a branding problem, and it was a business model problem."

What Gilmer and his team ultimately came up with was a new name that is descriptive of both the business and its people. "Energy, on the 'En' side of it, that had to be there, because we are energy," Gilmer began. "Then the 'ver' part means to 'see' in Spanish, and it means 'veracity,' or 'veritas' in Latin. And I think that really describes us. And then 'us,' which meant we're all in this together. We're just part and parcel of a larger community that goes to work every day to make the world demonstrably a better place."

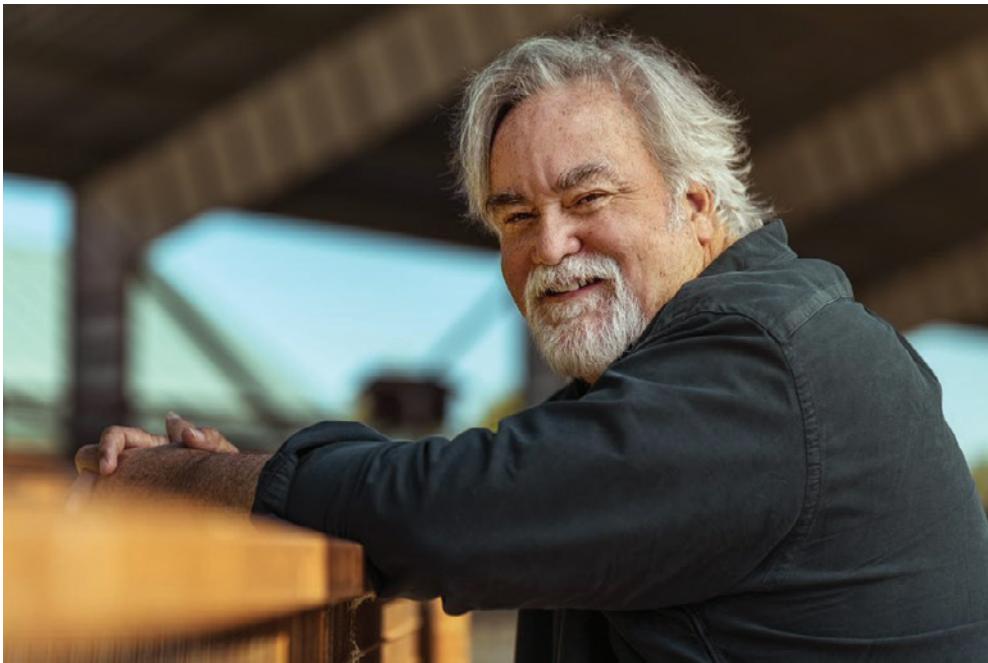
That all makes sense when put into those terms. But, as with any major change, the new name has led to an unforeseen issue: Some have begun to speculate that the switch to Enverus means the company ultimately plans to get out of oil and gas altogether.

When I asked him about that, Gilmer just laughed. "I would just say challenge people to pay attention to what we're buying and what we're building. Not only are we developing more tools and ways of looking at and evaluating oil and gas than ever, we are developing them faster and more of them than any other entity on the planet."



"Bruce Dern makes the best bad guy."

Several years ago, Gilmer and his wife, Riki were presented with an opportunity to help executive produce a small film about the history of Austin's iconic Saxon Pub. "I ran into Vince Foster, the Chairman of Main Street Capital in a restaurant in Houston, and he asked if I would go in with him to help executive produce this little Austin film that was about the Saxon Pub.



My wife, Riki, is from Austin and I've lived there for 22 years, and we both love the Saxon Pub, so I said absolutely we will do that."

That project worked out very well, as the film won several Festival awards, and as things have worked out, it has led the Gilmers into a long-term relationship with the film community. One new venture in which they're involved is a documentary, directed by Tara Wood, about the career of respected film director Quinten Tarantino.

"Tara had originally sold the rights to The Weinstein Company, who owned the whole Tarantino catalogue. They hadn't lived up to their Executive Production obligations and when the scandal broke, Tara asked for the project back. She eventually prevailed in bankruptcy court, but needed help in finishing the project. So we got to play the part of kind and gentle

DON'T EVER
WASTE A CHANCE TO
WANDER.



producers. We thought it was a great opportunity to give voice to someone who has much to say on an important subject," Gilmer said. "As Samuel Jackson says in the movie, 'I think there's going to be a lot of stories to come out of this that people are going to really want to hear, and I'm one of them.'

"The name of the film is 'QT8, the First Eight.' It's interviews with a lot of his stars and producers, a lot of stories about what happened in the background, his methodology, and all that stuff. As he told Tara at the Cannes Film Festival, 'The whole world is waiting to see my movie, and the only movie I'm waiting to see is yours.'

"QT8, the First Eight" debuted in a one-night national theater engagement on Oct. 21. It will be available in various VOD formats in December.

The Gilmers are involved in another project that is near and dear to Allen's heart. "We are also in the midst of filming a full-length feature film here in El Paso that stars the brother of Enverus' very own Andy Godboldt. Andy's our Domestic Sales Manager, who has been with Enverus for several years, a really fantastic young man.

"His brother, Ronnie Gene Blevins, is a hard-working character actor in L.A., and his best friend and former roommate Scott Windhauser is a working screenwriter. So, what this movie is going to be is giving a couple of guys who have been in L.A. a long time — one is an actor, the other is a director — give them their Rocky Balboa moment. Along with Ronnie as the lead, Bruce Dern is in it. He's going to be a bad guy, and Bruce Dern makes the best bad guy," he said with a laugh. "The other actors of note are John Ashton, 'Detective Taggart' in the original Beverly Hills Cop, Lara Flynn Boyle, and Stephen Lang, from Avatar.

"Plus, it's set in my home town, so that was something close to me, and I want to make sure the tone is right."

Anyone who knows Allen Gilmer and has seen what he has achieved in his life and how he has gone about doing it will have no doubt at all that the tone and everything else about this particular film will come out just right. Because Allen Gilmer is one of those guys who knows how to get things done.



About the author: David Blackmon is the Editor of SHALE Oil & Gas Business Magazine. He previously spent 37 years in the oil and natural gas industry in a variety of roles — the last 22 years engaging in public policy issues at the state and national levels. Contact David Blackmon at editor@shalemag.com.



Located in the lively downtown
Marina District, Omni Corpus
Christi Hotel offers luxurious guest
rooms with spectacular views
of the Corpus Christi Bay. Stay
with Omni to enjoy personalized
service and the most luxurious
accommodations by the sea during
this ideal Texas coast getaway.

OMNI  HOTELS
& RESORTS
corpus christi | texas

OMNIHOTELS.COM/CORPUSCHRISTI



AI Alone Can't Address Shale, Oil and Gas Production Optimization, Predictive Maintenance

HYBRID MACHINE LEARNING IS THE BEST MODEL TO FUEL BUSINESS IMPROVEMENT, REVENUES

By: Francois Laborie

Until recently, purely data-driven AI — machine learning, most notably — has been seen as the most attractive enabling new data technology for digitalization across industries, including digital twins deployed by heavy asset industries such as oil and gas, and shale — which is getting more attention recently in light of the attacks on key oil facilities in Saudi Arabia and oil production continuing to hit new lows.

More established, though much less hyped, physics-based modeling has rarely enjoyed the spotlight in recent years. However, artificial intelligence has an inherent black box nature. Black box models expose the outcome — such as how many times the model correctly identifies a cat in a series of photos — but provide no clue as to why the model arrived at the outcome it did.

Shedding Light on the Black Box Problem

The most commonly used practical example of this black box problem is training a cat identification model on 1,000 pictures in which each picture with a labeled cat in it — say 135 cat pictures — is in sunny conditions with a blue sky visible. It can then perfectly well be that the algorithm does not consider the cat as a signal in the picture at all but instead focuses on finding a sufficient surface area of sky blue and an overall light color tone in the picture.

From the output alone, this inner working of the model is impossible to see. And when validated against similar cat pictures taken in daylight outdoors, it will show very good accuracy. However, it will not have any chance of identifying any cat, no matter how clear in the picture, if taken inside a building with no sun and a darker color tone.

The black box nature of AI is why pure AI-based approaches are failing to gain full acceptance with field operations, which have a culture rooted in engineering sciences with zero risk tolerance for critical systems. In addition, mounting empirical evidence from hundreds of proofs of concepts involving promising AI startups by O&G industry leaders is debunking the omnipotence of AI to solve production optimization and predictive maintenance use cases.

Providing a Better Approach Using a Glass Box Model

This more informed reality of AI is driving the future of hybrid machine learning, a hybrid of physics and AI analytics that combines the glass box interpretability and robust mathematical foundation of physics-based modeling with the scalability and pattern recognition capabilities of AI.

Glass box models shed some light into how they arrive at the outcome, in addition to the outcome itself.

Both physics-based models and machine learning (the most common form of AI applications) can be used to make future predictions. The answer as to which one to use for what and when depends upon the problem you are trying to solve.

Problem classes fall into two primary categories:

1. Systems with lots of experimental data about historical behavior but no theoretical knowledge framework
2. Systems with good mathematical theory framework in place (commonly matched with equally robust empirical behavior data). One advantage of a physics simulator is that it can predict with a certain confidence even when no historical data exist. That means it works from first oil, meaning from the start of production. And it works during the design phase. Historical data is used to increase accuracy and estimate uncertainty.

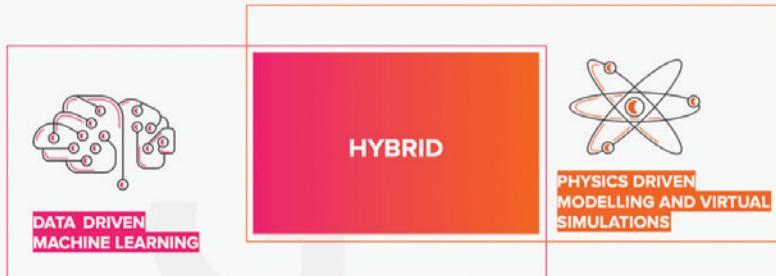
Identifying Limitations and What Works Best in Which Situations

For systems in the first category, a physics-based model isn't workable, as it's not possible to formulate a robust mathematical model to describe the system. Machine learning, however, does not suffer from the same limitation. AI's black box nature is an advantage here, making it possible to use machine learning also in such scenarios. That is assuming enough contextualized training data is available. With this condition met, a machine learning model should be able to learn any underlying pattern between the system and its outcomes and ultimately also make predictions.

Two caveats remain, however. The first is the questionable confidence level in resulting predictions (i.e., the precision and recall challenge), which could render an otherwise functioning AI approach unfit for many critical manufacturing processes. The second caveat is the oftentimes absent teaching sample of true failures in critical systems. Traditional scheduled equipment maintenance is designed to prevent such costly failures above all else.

For systems in the second category, a physics-based model can offer a good solution. Physics-based modeling is tried, tested and validated for even the most critical of simulations — such as space flight orbits. But it, too, has limitations. Its most notable limitation is the computational cost of persisting physics-based models in runtime environments with live data,

A COGNITE DIFFERENTIATES FROM PURE AI COMPANIES WITH A HYBRID DATA SCIENCE MODEL UNIQUE TO INDUSTRIAL REALITY



Mounting empirical evidence from hundreds of proofs of concepts involving promising AI startups by O&G industry leaders is debunking the omnipotence of AI to solve production optimization and predictive maintenance use cases. This more informed reality of AI is driving the future of hybrid machine learning, a hybrid of physics and AI analytics that combines the glass box interpretability and robust mathematical foundation of physics-based modelling with the scalability and pattern recognition capabilities of AI.

especially across computationally heavy IoT use cases. It is here where hybrid analytics machine learning is offering an attractive solution.

Describing the system in detail using a physics-based model produces physically accurate, rich and fully interpretable synthetic data, such as virtual sensor data and equipment breakpoint data. This data is then used to train a machine learning model for subsequent live operational data analysis in predictive maintenance and production optimization use cases, leveraging the fact that once a machine learning model is trained, using it to make predictions on new data, even large with high velocity, is very cost-efficient. This applies to subsurface resource development challenges like finding the optimal completion strategies, where the hybrid models can provide smart advice based on physics-based simulations and historical data.

To give the production algorithm its cognitive edge, subject matter experts supervise such hybrid machine learning models to truly understand (hence the term “cognitive”) the physical boundary conditions of the systems. This greatly enhances the algorithm’s ability to produce meaningful outcomes.

To conclude, hybrid models are best suited for complex industrial process problems where a mathematical theory framework exists that can be used to teach a machine learning model. That is then used on real-time data for predictions. The result is a high-confidence tailored hybrid model

combining strong domain knowledge (physics) with machine learning for cost efficiency and scalability. Especially in the proliferating space of digital twins, hybrid analytics is showing great potential.

Physics-based modeling

- Tested, tried and proven across industries for even the most critical applications
- The uncertainty in the models has been extensively studied and can be taken into account during design and operation
- Requires a good mathematical theory framework describing the system
- Can be calibrated and validated with limited experimental data sets
- Can predict outside the range of the existing data
- Requires a complete set of boundary conditions for the mathematical equations in addition to information like geometry and other fluid/material properties, which is not always available
- Commercial simulators are often very expensive
- Computationally expensive to run at scale in live IoT environments
- Requires extensive subject matter expertise
- Difficult to scale across fleets of assets. (BC, geometry and fluid/material properties must be changed, but the mathematical models scale. It may not scale with respect to time needed to set up a new asset, but it often scales well with respect to accuracy for different assets)
- Can predict future events

Data-driven AI

- Requires a large contextualized teaching data set, including critical mass of failure events
- Does not require information like geometry and fluid/material properties and can work on a much smaller set of sensors (but that influences accuracy)
- After initial model training, cost-effective to run with real-time streaming data
- Requires data science expertise
- Scales well across fleets of assets. (But a trained model can only be a transferer for very similar assets. A new asset may have different sets of sensors or on different locations, requiring retraining. A new asset also may be dominated by different physical phenomena requiring different sensors to get reliable predictions – the physics may not scale.)
- Can predict future events (assuming the future event is inside the training set)
- Not interpretable on prediction logic; black box

Hybrid analytics

- Combines physics-based modeling and machine learning
- Highly suitable for industrial systems analysts across many scenarios
- Requires both subject matter and data science expertise
- Offers semi-interpretable prediction logic
- Cost-efficient compared to pure physics modeling in production and at scale across fleets of assets
- Can be applied before any historical data exist (first oil)



About the author: Francois Laborie is President of Cognite North America. Visit www.cognite.com for more information.



Impact of SCADA in the Oil & Gas Sector

Special to SHALE

The Supervisory Control and Data Acquisition (SCADA) system implies a supremely customizable and configurable set of commercial and industrial software applications. The system can be used to support the management of any process chain in the midstream and downstream oil and gas sectors.

The midstream oil and gas sector requires distributed networks expanding over enormously long distances. These distances can range from many hectares for an end terminal tank farm to entire continents for a pipeline system. In other cases, installing and maintaining private or proprietary networks over these distances is not economically viable, particularly for pipelines. Thus, the need for remote measurement and analytics that is catered to by SCADA systems. Increasing demand for remote management of oil and gas pipelines, focus on process optimization through automation and digitalization, use of cloud computing services in the SCADA system, growing pipeline networks, and optimum and effective exploration of aging reservoirs make the SCADA and related measurement solutions perfect for solving all of the midstream oil and gas needs.

With the onset of several technologies like Industry 4.0, namely, Industrial Internet of Things (IIoT), crucial data about the system, such as the dependable process parameters, can be collected on the SCADA platform. This data can be further analyzed by applying advanced statistical methods and tools to tweak the process parameters in a way that the overall process performance is enhanced. This will massively ramp up the overall process performance.

Market Overview

As per an analysis by MarketsandMarkets, the SCADA oil and gas market was valued at \$3.27 billion in 2016 and is projected to be worth \$4.52 billion by 2022, growing at a Compound annual growth rate (CAGR) of 5.77% between 2017 and 2022. Increased investments in pipeline networks, rising demand for remote

management of oil and gas pipelines, and increased thrust on process optimization through automation and digitalization are expected to drive this market during the forecast period.

Based on the value stream, the market is segmented into upstream, midstream and downstream. Midstream is the largest segment in the market for SCADA oil and gas. Rising investments in pipeline infrastructure from countries such as the U.S., Canada, Russia, China and India is expected to boost the market growth in the near future.

Among regions, North America is expected to dominate this market in the coming years, owing to the increased investments in the pipeline infrastructure and adoption of cloud services in the region. Growing investments in refineries and exploration of new oil and gas fields in the U.S. and Canada are also expected to drive the demand for SCADA in the oil and gas industry in North America.

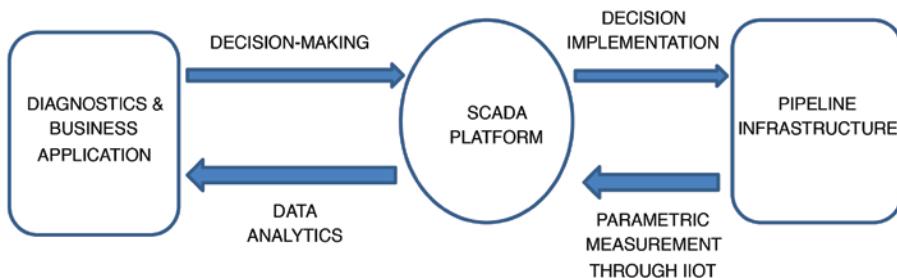
Declining and fluctuating oil and gas prices is expected to slow down the demand for the market in the years to come. However, the growth in R&D in the wireless sensor network and increased use of big data analytics offers lucrative opportunities for the market. Some of the leading players in this market include Yokogawa Electric Corporation (Japan), General Electric Company (U.S.), Honeywell International Inc. (U.S.), CygNet Software, Inc. (U.S.),

Siemens AG (Germany), Schneider Electric SE (France), Rockwell Automation, Inc. (U.S.), PSI AG (Germany), Mitsubishi Electric Corporation (Japan), Orbcomm Inc. (U.S.), Iconics, Inc. (U.S.), International Business Machines Corporation (U.S.), TechnipFMC plc (UK), and Emerson Electric Co. (U.S.). New product launches and contracts and agreements were the most commonly adopted strategies by players to ensure their dominance in the market.

In the current industrial practices, there is a need for an enhanced level of standardization, modularization and application portability to benefit from investments made in this domain. There exist numerous applications previously developed on pipeline SCADA systems, which have been custom-built developments. These are made to fit the requirements of a particular project, within a specific and predefined set of circumstances. These were not specifically produced with portability, reusability, maintainability and enhanced life cycle in mind.

With the ever-increasing pressure on modularization and its related advantages, the present-day SCADA system platform software allows the accommodation of standardized (pipeline) applications that can later be upgraded to newer versions of the system. The maintenance and upgrade of custom-made applications, as well as the protection of complex system architectures associated with them from cyber breaches

1. IMPACT OF THE SCADA SYSTEM IN THE PROCESS CHAIN



and security compromises, pose an increasing threat to pipeline operators. The market is changing to increased operating system revisions. No two pipelines are identical, and the operational philosophies distinctly differ from one pipeline operator to the other; any standardized application will require continuous ramifications to the existing platform. Thus, the need of the hour is a flexible OS environment, which can modify and upgrade itself as per the system requirements, via an online upgrading model. In the downstream processes, SCADA being implemented is believed to possess these traits and characteristics.

Thus, in the oil and gas sector, the need is of a sustainable pipeline automation and application system that would ensure a successful return on investment. This favors an IT-friendly platform that facilitates standard functions for:

- Management of processes
- Open connectivity
- Information, supervision, visualization and security

Conclusion

This will successfully provide the fundamental elements for any industry application, in line with pipeline management, to enable data and information consistency and security across the devised solution. This will eventually stop the waste of costly resources, eradicate the need for redevelopment efforts, and reduce the expenses of SCADA/MES software and application training programs. A system platform that would embrace these developments as an open application environment for pipeline SCADA is of paramount importance. It will allow a more seamless upgrade life cycle with minimal operational impact and at the same time with maximum efficiency. This will eventually provide the pipeline operator with the opportunity to keep the system continuously up-to-date within their operational expenditure budgets, so they can directly benefit from the new technology. All these factors will take pipeline operational excellence to the next level.

For more information: MarketsandMarkets™ provides quantified B2B research on 30,000 high growth emerging opportunities/threats which will impact 70% to 80% of worldwide companies' revenues. Currently servicing 7500 customers worldwide including 80% of global Fortune 1000 companies as clients. Almost 75,000 top officers across eight industries worldwide approach MarketsandMarkets™ for their pain-points around revenues decisions.

MarketsandMarkets™ flagship competitive intelligence and market research platform, "Knowledgestore" connects over 200,000 markets and entire value chains for deeper understanding of the unmet insights along with market sizing and forecasts of niche markets.

Visit Markets and Markets at
marketsandmarkets.com to learn more.

TAP INTO YOUR POTENTIAL

SHALE IS BOOMING AND THE COMPETITION IS GROWING.

Don't let your business get left in the dust – we'll steer your marketing to a new level of success.



Services may include but are not limited to:

- BRANDING
- WEB PRODUCTION
- SEARCH ENGINE OPTIMIZATION
- AD DESIGN
- SOCIAL MEDIA
- VIDEO PRODUCTION
- PUBLIC RELATIONS
- EMAIL MARKETING
- CAMPAIGN STRATEGY
- DIRECT MAIL

VISIT SHALEMAG.COM/MARKETING OR
CALL 210.240.7188 FOR ADDITIONAL INFORMATION.



UT Protest Ironically Targets University Funding Source

By: David Blackmon

The University of Texas was host to possibly the most ironic and ill-conceived protest in history in late October. As reported by the Daily Texan student newspaper: "The UT Center for Enterprise and Policy Analytics at the McCombs School of Business hosted the lecture in the Cockerell School of Engineering, where Alex Epstein spoke to a full Mulva Auditorium about the risks in using alternative means of energy and why he supports the fossil fuel industry. In the small hallway outside, about 30 students and environmental activists advocated against Epstein's claims against the efficacy of renewable energy."

The "environmental activists" included representatives from the usual suspect anti-development lobby groups based in Austin, including the Austin Sierra Club, Environment Texas and the Citizens' Climate Lobby, along with a small gathering of UT students representing ultra-radical leftist organizations like Extinction Rebellion ATX and Students Fighting Climate Change. None of that is particularly surprising or notable, other than that the "demonstration" attracted such a small number of participants.

Epstein is the author of the outstanding book titled, "The Moral Case for Fossil Fuels." Epstein's talks focus mostly on the myriad ways in which oil and gas and other fossil fuels have benefited modern society. I know this because, unlike the protesters, I've read Epstein's book and attended several of his speaking events, where I actually took the time to hear what he has to say.

But of course, in today's hyper-politicized society in which climate change activists pursue their objectives with the zeal of a global religion, actually listening to what folks perceived to be on the other side of the issue becomes not just inadvisable, but a forbidden exercise. All of which would be somewhat excusable had the protest group consisted solely of mushy-minded 18 year-olds.

Sadly, though, there were older adults involved as well. In fact, the protest itself was organized by a UT professor of geological sciences named Kerry Cook. As reported by the Daily Texan, Cook said she organized the protest to push back against lectures like Epstein's, which she said often go without fact-checking or moderation. Had the Professor bothered to read Epstein's book, she would know it is meticulously fact-based and foot-noted, and that his presentations are as well.

Regardless, the irony in all of this is the spectacle of a University of Texas professor leading University of Texas students in a protest against "fossil fuels." Why is that ironic? Because both the salary paid to Prof. Cook — and all UT professors — and the tuition paid by every student in the University of Texas system are highly subsidized by the Permanent University Fund, which derives its wealth annually from hundreds of millions of dollars of oil and gas royalty income from wells drilled on University lands in the Permian Basin of West Texas.

The Permanent University Fund, or PUF, was established in the original Texas Constitution as a means of supporting The University of Texas, which was then in its infancy. In establishing the PUF, the people of Texas set aside two million acres of what was thought to be essentially worthless land in West Texas as its initial assets.

Of that initial two million acres, one million consisted of lands that bordered some of the state's railroad rights of way, and the other million came out of state-owned lands in the region. In 1883, the Texas and Pacific Railroad granted an additional one million acres of land that it had deemed "too worthless to survey".

While that designation seems laughably absurd today, we have to remember that West Texas is mostly desert country, and in the late 1800s, when oil had yet to be discovered in Texas, there were few means of getting any value out of this arid land. What little income the man-



About the author: David Blackmon is the Editor of SHALE Oil & Gas Business Magazine. He previously spent 37 years in the oil and natural gas industry in a variety of roles — the last 22 years engaging in public policy issues at the state and national levels. Contact David Blackmon at editor@shalemag.com.

agers of the PUF were able to initially generate from the land came mainly from the leasing of grazing rights.

That all changed in 1923, when The Santa Rita No. 1 well struck oil on University lands in Reagan County, about halfway between Midland and San Angelo. That well produced for 67 years before being finally plugged and abandoned in 1990. The completion of the well — and the thousands of University land's oil and gas wells that have come since — had such a significant impact on the fortunes of the University of Texas system that, in 1940, the original wooden pumpjack that was used on the Santa Rita No. 1 was moved to the UT

students were housed in substandard buildings until well into the 20th century. The discovery of oil on University lands changed all of that, and today the University of Texas System consists of eight major university campuses and six health science institutions spread across the state. UT Austin regularly finds itself ranked among the top tier of publicly-funded universities in the country.

Back to those student protesters, I can't help wondering if any of them have the slightest idea about any of this? Do any of them have a clue what that big wooden rig situated at the corner of Martin Luther King Boulevard and Trinity Street on their campus represents?



campus in Austin, where it still resides in a place of honor near the school's football stadium today.

How significant have oil and gas revenues been to UT? So significant that, in 1931, the Texas legislature saw fit to actually split the fund, awarding one-third of its revenues from that point forward to the Texas A&M University system, a split that endures today. So significant that, of all university endowments in America, the UT endowment ranks second only to that of Harvard University. That significant.

When the drafters of that 1876 Constitution vowed to establish "a University of the first class," they really had no financial means of achieving that goal. The University of Texas remained a chronically under-funded college whose classes were conducted and whose

Mostly, I wonder if any of them have any notion about how the billions of dollars in annual revenues would be replaced if they were to prevail in their zeal to eliminate the production of oil and natural gas? That the school would have no choice but to dramatically increase tuition and fees, and place the burden of funding the real cost of their education on their shoulders?

Somehow, it seems doubtful they grasp any of that. Because if they did, the threat of having to take financial responsibility for themselves would most likely override their ideological zeal very quickly.

But hey, you're only young and naïve once, and then real life begins. So, the students at least have some excuse for their naivete. The adults present, especially a professor of geological sciences, don't have any excuse at all.

BOTH THE SALARY PAID TO PROF. COOK — AND ALL UT PROFESSORS — AND THE TUITION PAID BY EVERY STUDENT IN THE UNIVERSITY OF TEXAS SYSTEM ARE HIGHLY SUBSIDIZED BY THE PERMANENT UNIVERSITY FUND, WHICH DERIVES ITS WEALTH ANNUALLY FROM HUNDREDS OF MILLIONS OF DOLLARS OF OIL AND GAS ROYALTY INCOME



Half the World Would Starve Without Natural Gas Produced With Fracking

By: David Nabhan

The world's population, fast approaching the ten billion mark, is a milestone to be reached around 2050, so increasing global agricultural output by mid-century should be a priority if everyone on Earth is to be fed. Strangling the supply of natural gas and ammonia — and consequently the amount of fertilizer produced — is certainly disadvantageous toward that end, yet that is nonetheless what ill-advised proposed sanctions against hydraulic fracking would entail.

The planet's fast-growing population presents numerous challenges, yet humanity has faced similar daunting tests in the past and has always overcome them. It's estimated, for example, that two out of every five people today wouldn't exist without the potato having been introduced as a global staple beginning in the 16th century. More than a few pampered people in the West, their food seeming to magically appear on their plates and never having experienced hunger and privation, might shrug and tend to dismiss this fact.

The formidable complexities involved in delivering the daily bread to multitudes had once-been a topic of unsurpassed concern, but now it hardly resonates that urgently for those who take their sustenance for granted. Nonetheless, even as the lowly potato deserves humanity's sincerest appreciation, it wasn't a newly discovered tuber in the New World that produced the greatest change in the course of the history of feeding mankind, but a great watershed which took place as World War I was raging.

With Germany cut off from nitrates abroad, materials needed for the armaments industry, Fritz Haber and Carl Bosch achieved the miracle of pulling the precursor of explosives — and fertilizer — from thin air, from the inexhaustible ocean of nitrogen: the gas composing 78% of Earth's atmosphere. The Haber-Bosch process is the means by which inert nitrogen in the air, an element that is everywhere but which reacts to form chemical compounds only reluctantly, is heated and pressurized with hydrogen to form ammonia, the most basic of nitrogen compounds.

Of the species of bacteria able to fix nitrogen

HALF-A-BILLION TONS OF FERTILIZER IS PRODUCED EVERY YEAR, REQUIRING 2% OF THE WORLD'S ENERGY

— bonding it with other elements — only a few are intimately associated with plants such as rhizobia, for example, living in the root systems of legumes. Every living thing, however, requires these nitrates since the double-helixes of the DNA in the chromosomes of all plants and animals most critically can't be constructed without nitrogenous bases.

For the entire duration of the history of life on Earth, access to fixed nitrogen was an unbreakable ceiling for how much life could thrive on the planet. Whatever was produced by the few genera of microscopic organisms and through lightning strikes, determined the extent of the world's larder.

Farmers in the past made do as best they could with manure and rotating crops with nitrogen-fixing root bacteria to squeeze the most out of their fields. So, what two German chemists accomplished in pulling the precursor of explosives from the ether to arm the Kaiser's armies also turned out to be the seminal event in feeding the planet over the last century.

Naturally generated fixed nitrogen last year, and every year, supports a population of approximately 3.8 billion people, yet there are over 7.5 billion of us, giving rise to one of the most astounding facts: Half of the nitrogen compounds in the DNA of the chromosomes of all thirty trillion cells in our bodies — half of it — is artificial, cooked up in ammonia factories around the world, meaning half of us wouldn't be here without the Haber process.

Some half-a-billion tons of fertilizer is produced via the Haber process every year, requiring 2% of the world's energy to apply the heat and pressure demanded to force nitrogen pumped from the air to bond with hydrogen to form ammonia. To acquire that hydrogen, an astonishing

5% of the world's natural gas production, methane — two-thirds of which in the U.S. is extracted by hydraulic fracturing of subterranean rock layers with pressurized fluids — is fed into chambers and mixed with steam where both compounds react to give up their hydrogen components.

That's how the world is fed, so those calling for an end to everything — no cars, no meat, no oil, no aviation, no coal, no gasoline, no steel, no plastic, no methane, no fracking — are naively appealing for no people as well, or at least fewer than are currently walking on Earth now. Half would have to go, if not you then me, since not all of us can survive a return to the epochs when our food ceiling was at levels imposed back in the Stone Age and before, when it was rhizobia bacteria and lightning that held sway over humanity and not the other way around.



About the author: David Nabhan is the author of *Earthquake Prediction: Dawn of the New Seismology* (Skyhorse Publishing, NY, 2017) and three other books on seismology. He writes bi-weekly science columns for both *Newsmax* ("Shaking Up Science") and *The Times of Israel* ("Tectonic Shifts") and has authored hundreds of papers, articles and op-eds published all over the world. Website: www.earthquakepredictors.com Contact: davidwrites200@aol.com



Your Path to Personal and Professional Success

- Powerful People Skills
- Inspiring Presenters
- Leaders Who Build
- More Sales & Amazing Service
- Activate Organizations
- Working With Millennials

Transformation Starts Here

It's time to get human again

Everyone is born with unique strengths that are fueled by the passions to help them thrive in the world. Sometimes, one is front and center and needs a little polish. Other times, they are concealed by uncertainty and need to be coaxed into the open. At Dale Carnegie, we help people from all walks of life become fearless. Whether they are starting out or stepping up, learning to lead or heading up a team, we sharpen their inner voice so they can use it with confidence to solve challenges in their personal and professional lives.

IGNITING WORKPLACE ENTHUSIASM

Dale Carnegie Course

The Dale Carnegie Course will help you master the communication skills necessary in today's demanding business environment. You'll learn to strengthen interpersonal relationships and develop a commanding attitude, instilling confidence and enthusiasm in your workplace.

Leadership Training For Managers

Through this program, your management team will morph from managers of yesterday's modes, to leaders who inspire, energize and innovate to meet tomorrow's challenges.

Dale Carnegie Sales Training

Winning with Relationship Selling stands out as the only sales training program that combines a proven selling process with timeless customer relationship skills.

High Impact Presentations

The program focuses on structuring a presentation, building credibility and selling your idea. How to use voice and gesture to create a strong impression. How to handle a formal speech, impromptu remarks, or a challenging meeting.





Competing Oil Companies Work Together to Address an Urgent Need in Midland

By: Annette Heng

Fields in the Permian Basin flow with more oil and natural gas than anywhere else in the world, yet the employees working in them live in a child care desert.

Four major competitors — Anadarko Petroleum Corporation, Chevron U.S.A., EOG Resources and Occidental Petroleum — recognized this issue and recently joined forces to provide a resource that's a scarcity for working parents in the area: high-quality, accessible child care.

United by their understanding of the importance of early education, the companies looked to Primrose on Premise® — the employer-sponsored extension of industry leader Primrose Schools® — for a solution. Ultimately, the four companies came together to support the opening of Primrose School of Midland at Westridge. The school, which opened in April 2019, is located at the intersection of all four corporations' Permian headquarters and will provide premium early education and care for 240 children at full capacity.

Growing Pains

You don't have to look far to see how access to child care became a major issue for the region. In 2018, the Permian Basin experienced the largest population growth in the U.S., and the employment rate increased more than seven times the national average thanks to the booming oil and gas industry.

As new families are drawn to West Texas for employment, the area's exponential growth has created a critical challenge: job openings are outpacing child care center openings. More than 1,400 children were on daycare waitlists in the Midland area last year. Some communities lack a licensed child care provider altogether, and some have so many young children that infants and toddlers outnumber licensed daycare spots by up to 44 to one.

This imbalance creates an economic strain on the community, forcing many dual-income families to have one parent stay home as a caregiver. And, in this case, it also encouraged major employers in the area to consider offering employer-sponsored child care — both to help address this critical need and also ensure that employee benefits would remain competitive enough to drive successful recruitment and retention efforts across the region.

Gender Diversity

When child care is inaccessible or expensive, women are often the ones to leave their careers to serve as their child's primary caregiver. For oil and gas companies, this exacerbates a gender diversity issue that has plagued the energy sector. In the U.S., women currently comprise 47% of the total workforce, but only 15% of the oil and gas sector. The industry has consistently struggled to attract and retain female talent, especially in STEM roles.

With a significantly lower number of women entering the field compared to other energy sectors, the oil and gas industry is also failing to attract and retain young talent. Some of the most common reasons women voluntarily exit the workforce include limited career opportunities, lack of flexibility and lack of effective sponsorship and mentoring.

The Solution

As a growing number of Fortune 500 energy companies recognize the need to offer family-friendly benefits to attract and retain top talent, notable corporations have sought the expertise of leading early education and care provider Primrose Schools to help them develop customized solutions. By working directly with the company's employer-sponsored child care division, Primrose on Premise, Anadarko Petroleum Corporation, Chevron U.S.A., EOG Resources and Occidental Petroleum aligned in an unprec-

AS NEW FAMILIES ARE DRAWN TO WEST TEXAS FOR EMPLOYMENT, THE AREA'S EXPONENTIAL GROWTH HAS CREATED A CRITICAL CHALLENGE: JOB OPENINGS ARE OUTPACING CHILD CARE CENTER OPENINGS



To learn more about Primrose on Premise employer-sponsored child care, visit PrimroseSchools.com/OnPremise.



BY WORKING DIRECTLY WITH THE COMPANY'S EMPLOYER-SPONSORED CHILD CARE DIVISION, PRIMROSE ON PREMISE, ANADARKO PETROLEUM CORPORATION, CHEVRON U.S.A., EOG RESOURCES AND OCCIDENTAL PETROLEUM ALIGNED IN AN UNPRECEDENTED WAY TO PROVIDE A BENEFIT THAT NOT ONLY HELPS THEIR EMPLOYEES BUT ADVANCES THE ENTIRE COMMUNITY

edented way to provide a benefit that not only helps their employees but advances the entire community.

"As we look to the future of the energy industry, we know Midland-based employees will continue to play a key role in driving the long-term success of the Permian and Delaware Basin," said Chad McAllaster, Vice President of Development for the Delaware Basin at Anadarko Petroleum Corporation.

"We want top-notch talent to see Midland as a career destination, and by providing premier early education and care, we reinforce that commitment by helping to deliver an exceptional quality of life for employees and their families."

Mark Grommesh, the President and General Manager of Permian resources and the Midland Basin for Occidental Petroleum, added, "We take care of our employees who live, work

and raise their families here. When we help ease the demands of everyday life through programs like this one, our employees have the support they need to enjoy and advance their careers."

In addition to the investment these four companies made in Primrose School of Midland at Westridge, Primrose also recently worked with Apache Corporation to open another Primrose on Premise location in Midland in late 2018.

These companies know that offering employer-sponsored early education and care as part of their benefits packages addresses a critical need for working parents while contributing to the overall growth of their organizations. A Child Care Aware study published in 2018 showed companies that sponsor such perks enjoy a competitive advantage and a high ROI, including:

- **Reduced turnover:** Access to reliable child care can reduce employee turnover by 60%.
- **An advantage in recruiting millennials:** 83% of millennial parents reported they would leave their job for one with more family-friendly benefits.
- **Diminished turnover among working mothers:** Women who receive assistance for child care costs are 40% more likely to still be with the company two years later.
- **Reduced absenteeism:** 54% of employers say child care services had a positive impact on employee absenteeism.

The benefits of employer-sponsored child care are undeniable, and this offering is becoming increasingly important to both companies and employees across the country. Truly, the Permian Basin embodies the critical need for early education and care impacting countless communities across the country – and Anadarko Petroleum Corporation, Chevron U.S.A., EOG Resources and Occidental Petroleum should be commended for championing this employee benefit in Midland and providing much-needed support for working parents and their families.

At Primrose Schools, we want to be a part of the solution. Primrose has more than 35 years of expertise and a track record of success in more than 400 schools nationwide. Through Primrose on Premise, we're proud to bring premier employer-sponsored early education and care, as well as our exclusive Balanced Learning® approach, to companies leading the charge to address an urgent need for working parents and across America.



Where Are the Women in Oil & Gas? We've Always Been Here

By: Leslie Beyer, PESA

From the Spindletop to the shale revolution, the major historical accomplishments of our industry are well known. And while oil and gas currently lags behind in hiring and promoting women — who are only 15% of the workforce — there are several little-known women who made their mark on the industry.

Take the world-famous "Nellie Bly." Elizabeth Jane Cochran Seaman was well known for her investigative newspaper reporting under that pseudonym. But she also patented the first practical, leak-proof 55-gallon oil drum in 1905, and her Iron Clad Manufacturing Company produced 1,000 steel barrels daily until the start of WWI.

Reba Masterson became the first female petroleum geologist after obtaining her degree at The University of Colorado in 1916. Given a love of the industry and its wildcat nature from her father, Masterson spent her formative years chasing down leases in Texas and Colorado. Landowners and investors at the time were hungry for scientific opinions, and Masterson eventually worked her way through Kansas, Illinois, West Virginia, Pennsylvania and Kentucky. At the time of her death in 1969, she owned oil and gas properties in 20 Texas counties.

In California, where Los Angeles was a boomtown from the late 1800s to the 1930s, piano teacher Emma Summers invested \$700 of her savings for half-interest in a well close by her house in 1883. She ran into drilling problems, borrowed another \$1,800, and sat by the well each night for weeks. Eventually, the well came in, and she borrowed money to buy stakes in several other wells.

Summers educated herself on how oil equipment worked and on how to sell oil. She soon became a one-stop shop for hotels, factories, railroads and the Pacific Light and Power Company. Her business both produced the oil and refined it: taking the thick, viscous oil (known as brea) and using boilers heated it and drained off the sediment. She also had 40 horses and 10 wagons that she used to deliver oil to customers. By 1900, Summer had 14 wells that were producing 50,000 barrels a month, and she became known as the Oil Queen of California.

Women trailblazers were also present onshore in the Gulf of Mexico after WWII. Women gained skills in factories and shipyards during the war, and they used those skills to seek employment in the industry. Women worked everywhere, from clerical and office work to heading up small businesses supporting onshore offices.

Beginning in the 1970s, they also began to work jobs on rigs and platforms. Karen Gray began working offshore of Louisiana in 1981. The company had to build separate quarters for women, and Gray was hired as a maintenance



specialist on an Exxon rig. My great aunt Faye Newsom was one of these women, working as a roughneck for Amoco Oil Company for many years.

In the 1960s, when the 800-mile trans-Alaska pipeline was being constructed, women were encouraged to break gender barriers after President Lyndon Johnson signed an executive order that required affirmative action hiring practices among federal contractors. Some unions at the time were also recruiting female members. As a result, the North Slope saw women become expeditors and pilots, work in construction and security, and eventually as pipefitters, truck drivers and roughnecks.

There are many other women who have achieved "firsts" in their field, from Abigail Ross Hopper, the first female director of the U.S. Bureau of Ocean Energy Management to Vicki Hollub, the first woman to head a major U.S. oil company. Women continue to make important contributions to the industry and based on this history, we can expect that trend to continue.



About the author: Leslie Beyer is President of the Petroleum Equipment & Services Association (PESA) in Houston. In this role, Beyer leads strategic and operational development of PESA's programs, expansion and execution of its mission in support of oilfield services and equipment organizations. Highlights of Beyer's career include 15 years in Washington, D.C. serving in the U.S. Senate, multiple presidential campaigns, the White House – Executive Office of the President, U.S. State Department and U.S. Department of Housing and Urban Development.

Beyer holds a BA in Latin American Studies and Spanish from the University of Texas at Austin. She serves on the World Affairs Council of Greater Houston, IPAA/PESA Education Advisory Board and the World Petroleum Congress 2020 Committee.



The future of energy? We're on it.

The best thing about the future is when it comes speeding into the present.
For us, that time is now.

Innovative and flexible ways to power customers at home and on the go?
We're delivering them.

Greater control for businesses to understand and reduce costs?
We're providing it.

Sustainable approaches for generating electricity in the first place?
Our parent company, NRG, is at the forefront of that as well.

Here's to the present – a pretty futuristic place to be.

Want to learn more? Develop something new? Let's talk.
reliant.com | 1.800.713.3191

Reliant is a registered servicemark of Reliant Energy Retail Holdings, LLC, a wholly owned subsidiary of NRG Energy, Inc.
The plus signs and plus clusters are servicemarks of NRG Energy, Inc. © 2016 NRG Energy, Inc. All rights reserved. SOL.2016

reliant
an NRG company

IT'S OUR MISSION

to serve as the bridge
connecting the oil and natural gas
industry to South Texas communities.

STEER will work to ensure that all stakeholders throughout the Eagle Ford Shale region are able to effectively maximize opportunities in a responsible and collaborative way.



South Texas Energy
& Economic Roundtable

Learn more at steer.com

Follow us:



[facebook.com/STEEROUNDTABLE](https://www.facebook.com/STEEROUNDTABLE)



@STEEROUNDTABLE



INVEST HERE.

WORK HERE.

LIVE HERE.

TEXAS USA



INGLESIDE
CHAMBER OF COMMERCE

Connecting &
Growing Together

inglesidetxchamber.com



Oil and Gas Opposing Views Ignore Reality

By: Bill Keffer

Looking back on 2019, it is amazing how the headlines in the energy world continue to be more of the same, in terms of both achievements and challenges — only more so. In fact, on the day I'm writing this column, one of the headlines is, "US crude oil production breaks new record high" at 12.6 million barrels per day. That new record high in domestic production happened, despite the fact (and, more likely, the reason) that crude-oil prices have dropped to \$53 a barrel. The Energy Information Administration (EIA) estimates even more production in 2020 of 13.23 million bpd.

The news on natural gas that week was equally impressive. The Potential Gas Committee reported that the amount of total recoverable natural gas in the U.S. has risen to a new record high of 3,374 trillion cubic feet. At current levels of consumption, that amount would last more than 100 years. In other words, even with all of the prolific production of crude oil and natural gas in the U.S. since it all began in 1859, we still have more oil and gas reserves than we have ever had before. That is an incredibly crazy, counter-intuitive fact that should both astonish us and cause us to be humble and eternally grateful to be blessed with such abundant and critical natural resources.

This tremendous growth in our oil and gas resources, because of the shale revolu-



tion, has been the long-playing headline for several years now. Even so, rank-and-file Americans still seem to be unaware and continue to operate on the ever-present misconception that we are somehow running out of oil and gas. Every semester, students in my oil and gas law class are under that mistaken notion. Where do they get that idea? Needless to say, there are anti-fossil fuel agendas that are not shy about perpetuating that storyline for their own purposes — the facts be damned. But I recently confirmed another likely source of bad information (if not indoctrination).

I was invited to speak to high school students in a small New Mexico town, literally surrounded by Permian Basin oil and gas production. My presentation included these statistics about our incredible production rates and seemingly endless reserve

estimates. One of the teachers listening to my remarks was the first to ask me a question, which went something like this: "Can you actually look at these students and tell them that there will be any oil and gas left by the time they graduate from college to be able to pursue a career in that field?"

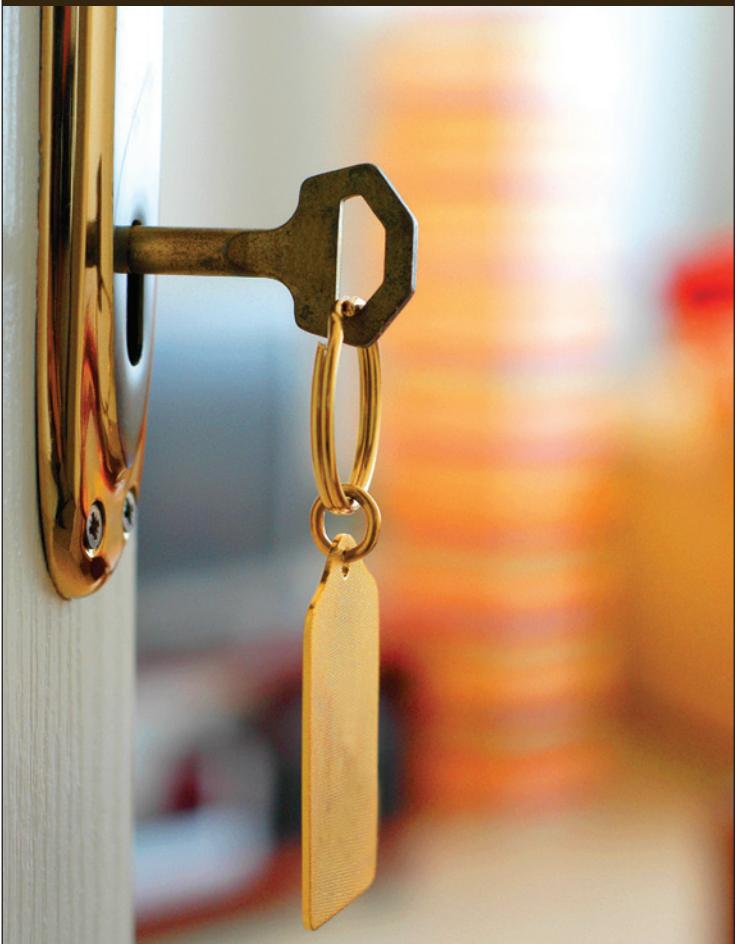
I was shocked — but, I guess, not that shocked — to hear a high school English teacher ask such a clearly uninformed question, especially living and working in the middle of an oil field, in a state that just set a new record for annual production and was enjoying a substantial budget surplus because of the tax revenue generated by their increased oil and gas activity. Do high school teachers not watch the news or read newspapers anymore? If she didn't know that, what else doesn't she know? And what kinds of things is she teaching those students?

SHOULD WE STOP USING OIL AND GAS, LIFE AS WE KNOW IT WILL, IN FACT, END



About the author: Bill Keffer is a contributing columnist to SHALE Oil & Gas Business Magazine. He teaches at the Texas Tech University School of Law and continues to consult. He also served in the Texas Legislature from 2003 to 2007.

*Opening Doors in San Antonio
Since 1974*



KING REALTORS is dedicated to helping San Antonio and the oil industry with their real estate needs.

If you are looking to buy or sell a property, call us and say you saw it in *SHALE Magazine!*



TABITHA KING
210.414.4255

5600 Broadway Avenue • San Antonio, TX 78209

KingRealtors.com
tabitha@kingrealtors.com

And now I have a clearer understanding of why students in my law school class don't know what they don't know — or, even worse, think they know things that are just wrong.

Having an abundant domestic supply of oil and gas also means that we are no longer dependent on other countries. As recently as 15 years ago, the U.S. was importing 60% of our oil from other countries. Today, we are importing only 6%. It is hard to overstate how significant just that one statistic is to our national security.

In spite of that indisputably, incredibly, overwhelmingly great news, opposition to the continued use of oil and gas in the form of every possible kind of challenge imaginable grows more widespread, virulent and irrational.

Coincident with Indian Prime Minister Modi's visit to Houston and meeting with President Trump to discuss U.S. exports of natural gas to India, 11 protesters with Greenpeace shut down traffic in the Houston Ship Channel by dangling from a bridge to call attention to the climate crisis. I wonder how much their parents paid for their college education.

State governments are one-upping each other in their race to require 100% electricity from renewable energy sources. Maine, California, Hawaii, Nevada and New Mexico are all declaring that goal by 2050; New York and D.C. by 2040. Here's a tip: Declaring something doesn't make it so.

A California bill already passed by their state legislature would effectively prevent any oil and gas produced under new leases on federal land from being able to move off the property. It awaits Governor Newsom's signature. The California cities of Berkeley and San Jose have passed ordinances that will ban the use of natural gas in new buildings in those cities. Ironically, as California continues to dig a deeper energy-poverty hole, they are becoming more dependent on importing what they need from foreign countries. Do they teach logic in California schools?

Another headline this week is that California's main utility company, PG&E, is having to implement forced blackouts to prevent their power lines from sparking more wildfires because of the intense winds. The reality of such blackouts could quickly drive home the point that no one wants to live in a world of uncertain electricity — that's the hallmark of a third-world country. In Texas this past August, ERCOT reached a stage-one emergency because of record demand and limited excess capacity. As more coal-fired, natural-gas-fired, and nuclear-fired power plants are retired, due to sub-market prices charged by wind and solar sources still being subsidized by federal tax credits, the potential for blackouts here will only increase because there will no longer be enough baseload power to step in when the wind stops blowing and the sun stops shining.

Lawsuits continue across the country, in which plaintiffs are suing for a constitutional right to a clean (read: no oil or gas) environment and for substantial damages from oil companies for fraud and criminal conspiracy (read: tobacco and asbestos). And that's just the tip of the proverbial iceberg (which is melting anyway because of global warming).

The good news keeps getting better, and the bad news keeps getting worse. How is it that Americans can see this issue in such diametrically opposed ways? One side frantically proclaims that computer models predict that life as we know it will end if we don't abruptly and completely stop using oil and gas. The other side can actually and empirically demonstrate that, should we stop using oil and gas, life as we know it will, in fact, end.

Texas' Impending Reliability Issues With Wind Power

By: Mary J. Hutzler, Senior Fellow at the Institute for Energy Research (IER)

Texas has the most wind capacity of any state, generating about 16% of its electricity from wind. In August, as temperatures rose to over 100 degrees and consumers increased their use of air conditioning, Texas' grid operators struggled to meet the record demand for electricity. Many of the wind turbines could not operate because the wind was stagnant, a common occurrence on very hot days. As a result, energy costs skyrocketed. In Houston, wholesale power prices spiked nearly 49,000% (to \$9,000 per megawatt-hour). The Electric Reliability Council of Texas (ERCOT) warned that reserve margins were so low that it might have to institute rolling blackouts. The independent system operator called for the construction of more gas-fired generating plants.

Facing its second consecutive year of strain on its grid, ERCOT mandated all available power plants to run flat-out, called on factories to cut power consumption, and imported electricity from Mexico.

Power reserve margins were so thin that increments of just tens of megawatts were available to meet demand. The state called the first of its three levels of emergency and hit its market price cap of \$9,000 per megawatt-hour to avoid rolling brown-outs. According to ERCOT, if one of the state's large natural gas plants had gone offline when reserve margins were thin, rolling blackouts might have been unavoidable.

Texas has a deregulated power market in which competition holds down power costs unless demand is high and then spot prices skyrocket. Texas prepared for the hot weather this summer, allowing generators to request permission to disregard air regulations, ordering all generation assets to be available and importing power from the neighboring Southwest Power Pool market.

Aug. 13 and 15 were the toughest days because most of the state's 26 gigawatts of wind capacity were becalmed in the mid-afternoon, and a few power plants that had been running flat-out for days began to fail from the high tem-

IN HOUSTON, WHOLESALE POWER PRICES SPIKED NEARLY 49,000% (TO \$9,000 PER MEGAWATT-HOUR)

peratures that increased demand across the state. As wind power slowed, ERCOT instituted its first level of emergency alerts, calling on small industrial and commercial generators to pour power onto the grid, and requesting power from Mexico from which an additional 60 megawatts were imported on Aug. 15. Installed capacity numbers for electricity from intermittent sources such as wind and solar mean very little when they fail to produce as wind did in the middle of the hot Texas summer.

ERCOT did not need to institute rolling brown-outs since the situation did not escalate beyond the second level of emergency alert in which it would call on about 1,100 megawatts of load to drop off the system.

The Texas power market does not include a capacity market that pays generators to keep power plants available. As inexpensive natural gas and subsidized renewable power pushed down power prices, coal's market share dipped below that of natural gas and wind. Last year alone, the state retired more than 4 gigawatts of coal-fired capacity, or almost 70 times as much power as was purchased from Mexico on Aug. 15.

The situation may get more dire as additional wind farms are being built. Facebook recently announced a deal in Texas to buy power from

About the Author: Mary J. Hutzler is a Senior Fellow at the Institute for Energy Research (IER). Until she left government in 2006, she was a top energy analyst for the U.S. government, having spent more than 25 years at the Energy Information Administration (EIA), where she specialized in data collection, analysis, and forecasting.



the largest single-site wind farm in the country. The power purchase agreement will obtain power from the 200-megawatt Aviator Wind East project, which is scheduled to come online in 2020 in Coke County, Texas. The Aviator East initiative is part of a larger 525-megawatt project. While there are larger U.S. wind farms, those have typically been built in phases, not in the single-phase construction planned for Aviator Wind East.

Texas's 100% Renewable Experiment

Last October, Georgetown, Texas obtained a \$1 million grant from former New York City Mayor Michael Bloomberg's non-profit, Bloomberg Philanthropies, in which the city planned to obtain 100% of its electricity from wind and solar power. The grant's only real requirement, however, was that the city serve as a public relations platform to convince Americans to abandon fossil fuels and switch to renewable energy. The town's politicians promised that the renewable energy would be cheaper. But, as more wind and solar power displaced natural gas, electricity bills went up.

The city's municipal utility now has a \$7 million shortfall that has to be made up by the city's consumers through higher elec-

tricity bills. Embarrassed, the City Council voted 5-0 to kill the Bloomberg PR deal. It also raised property taxes.

As part of the Bloomberg agreement, Georgetown was planning to install solar panels on homes and obtain a battery storage farm to store electricity when wind and solar power were not available. For Georgetown to be 100% renewable using today's state-of-the-art batteries from Tesla's Gigafactory, the city would need a \$400 million battery farm weighing some 20,000 tons to avoid a blackout. And, after spending \$15,600 for each household for such a battery farm, its backup power would be drained in 12 hours with a single windless night.

A Lesson Well-Learned

The close call in Texas in mid-August should be a lesson for ERCOT to rethink how it is valuing dispatchable, baseload power. The addition of more intermittent capacity to the market will likely make the reliability challenges Texas is facing only more difficult to manage. Further, the 100% renewable goal that several states have instituted should be viewed as a farce as the city of Georgetown recently discovered.



INTRODUCING THE SHALE MOBILE APP

Free to Download
on iPhone and Android

GPS-Enabled Directory

Oil and Gas
Survival Kit and More!



10 Ways to Advance Produced Water Recycling and Reuse

By: Blythe Lyons, John Tintera, and Kylie Wright*

Oil and water may not mix, but in Texas, they are deeply connected to our success in oil and gas production. To maintain our energy production dominance and continue decreasing reliance on foreign imports, Texas must continue to improve how we handle produced water.

One answer is to increase the recycling and reuse of produced water, as outlined in our recently published white paper: "Sustainable Produced Water Policy, Regulatory Framework, and Management in the Texas Oil and Gas Industry: 2019 and Beyond."

Published by the Texas Alliance of Energy Producers and co-sponsored by the Independent Petroleum Association of America (IPAA), the white paper provides 10 recommendations to encourage the economical and sustainable recycling and reuse of produced water.

But first, why the focus on recycling and reuse?

The Drivers

Here are a few of the factors that are driving the industry towards increased recycle and reuse:

- Over the next five years, the total statewide volume of produced water could roughly double to 15 billion barrels per year (Source: Source-water, Inc.)
- Disposal wells must continue to be an option, but capacity may be constrained and costs may increase due to changing seismic-related regulations
- Freshwater and trucking costs are increasing
- Advancements by the midstream water management companies have made recycle and reuse a viable, cost-effective option
- Produced water recycle and reuse offset the need for freshwater for fracturing operations and decrease truck traffic, enabling operators to reduce operating costs
- The Texas regulatory and legal environments encourage safe and economic reuse and recycling options

The Challenges

Despite the great strides Texas has made in produced water management, challenges remain. For example, federal regulatory overreach is a constant threat. Texas must maintain sovereignty over produced water management.

Then, there are the environmental, community and political issues that factor into whether operators opt for treatment over direct disposal. Texas must work to ensure that state and federal rules, laws and regula-

tions keep pace with the rapidly evolving business models of oil and gas production and produced water.

10 Recommendations to Expand Produced Water Recycle and Reuse

To address these challenges and encourage more recycle and reuse, the white paper promotes three guiding principles going forward:

- Texas must maintain leadership and control over produced water management
- Texas must continue to update its laws, regulations and practices
- The federal government must update its rules and continue discussions with its state partners

These are the ten specific recommendations outlined in the white paper:

Maintain Texas Leadership Over Produced Water Management:

1. Preserve the Resource Conservation and Recovery Act (RCRA) exemption: The RCRA creates the framework for the proper management of hazardous and non-hazardous solid waste. Both flowback and produced water are exempt under the RCRA. Maintaining the existing RCRA regulatory framework is the foundation for almost all oil field waste management practices – and essential for expanding produced water management options. The RCRA exemption paves the way for Texas to maintain primary jurisdiction over produced water.
2. Delegate National Pollutant Discharge Elimination System (NPDES) authority to Texas: Effective Sept. 1, 2019, statutory authority of NPDES is now under the TCEQ (Texas Commission on Environmental Quality) instead of the Texas Railroad Commission. The new law directs the TCEQ to submit a request to the EPA to seek federal NPDES delegation to Texas of these types of discharges. Achieving this delegation of federal authority to the state of Texas will ensure state rather than federal oversight, streamline permitting and enhance recycle and reuse opportunities in Texas.
3. Maintain Texas jurisdiction over pipelines: If federal agencies such as the Pipeline and Hazardous Material Safety Administration (PHMSA) gained jurisdiction over produced water transportation, it would be disruptive and costly to the recycling industry. It would also have little positive impact on the state's ability to oversee produced and recycled water pipeline operations.



OVER THE NEXT FIVE YEARS, THE TOTAL STATEWIDE VOLUME OF PRODUCED WATER COULD ROUGHLY DOUBLE TO 15 BILLION BARRELS PER YEAR

Update State Laws, Regulations and Practices

4. Increase interstate and association policy coordination: The more energy-producing states, associations and work groups share information, the better. This collaboration can help standardize policy as much as possible, given the significant variations in state authority. National groups and associations such as the IPAA, American Petroleum Institute (API), Groundwater Protection Council (GWPC), and Interstate Oil and Gas Compact Commission (IOGCC) should all play a role in this.
5. Revise produced water statutes and regulations: The existing State of Texas framework for regulating produced water management is comprehensive and adequate. However, changes may be required at times as technology and practices evolve. For example, in 2013 the Texas Railroad Commission reworked the recycling regulatory framework to implement a Permit by Rule (PBR) concept. This concept has encouraged produced water recycle and reuse and may be applicable to other operations in the oil field such as facility and pit permits.
6. Prepare a roadmap for beneficial reuse outside the oil and gas industry: The industry should maintain its focus on operations and sound produced water management in the oilfield. The government's role can be to encourage uses outside the oilfields by updating regulations, sponsoring research and issuing permits for pilot studies. Also, a solid and repeatable funding mechanism to defray the cost of these academic and scientific studies would benefit all.
7. Develop incentive mechanisms to lower produced water treatment costs: Recycling practices have the potential to conserve water, improve supplies and eventually make beneficial reuse possible. For these reasons, Texas should consider and study incentives for water recycling. The Texas Legislature has mentioned the need for an interim study of incentives and should pursue this work.

8. Collect and provide public access to better-produced water data: Up-to-date and publicly available data about produced water production and recycle and reuse is sorely lacking. Texas should develop or encourage the development of a mechanism for collecting and reporting statewide produced water data in a way that is not burdensome to industry, and that maintains operator confidentiality. This would help the public understand the value and future of oilfield recycling. The industry should also standardize produced water terminology, reporting and disclosure.

Federal Policy Updates and Discussions:

9. Update or eliminate 98th Meridian policy: Policy and procedures for federal NPDES permits differ to the east and west of the 98th meridian, an arbitrary geographic marker that bisects Texas into land roughly east or west of Dallas. The EPA must eliminate or modify this federal regulatory contrivance. This will encourage discharge applications to be considered on a site-specific and case by case basis, honoring the recent technological advances in produced water recycling.
10. Institutionalize Texas and federal agency cooperation: States such as New Mexico have joined in memorandums of understanding with the EPA and participated in white papers involving produced water. Meanwhile, the EPA issued its own draft "Study of Oil and Gas Extraction Wastewater Management" in May 2019, to be finalized by year-end. These types of collaborative efforts could benefit Texas.

The maverick attitude and work ethic that created the shale revolution is alive and well on the H2O side of the equation. As the midstream industry continues to mature, produced water recycle and reuse is likely to increase. Texas needs to build on the solid foundation now in place and ensure expansion with the right statutes, regulatory framework, civil law and economic incentives.



**About the authors: Wright, Tintera and Lyons (L to R). John Tintera is the past President of the Texas Alliance of Energy Producers. He is the former Executive Director of the Texas Railroad Commission, is a regulatory expert and licensed geologist (Texas #325) with a thorough knowledge of virtually all facets of upstream oil and gas exploration, production and transportation, including conventional and unconventional reservoirs. Blythe Lyons serves as a consultant to the Texas Alliance of Energy Producers, and was formerly a Senior Fellow with the Atlantic Council's Energy and Environment Program. Kylie Wright is a Senior Environmental Specialist with GAI Consultants, Inc. and is a former geologic consultant with the Texas Alliance of Energy Producers.*



Fracking Ban Rhetoric Sends a Chill Down the Spine

By: Bette Grande

We are still a long way from Nov. 2020, but if one of the Democrat candidates wins the election you are going to need more than President Carter's cardigan to keep warm. The candidates' positions on energy and the environment are changing faster than the weather.

Of course, Sen. Bernie Sanders (I-VT) has called for a ban on fracking since his 2016 presidential campaign, and now nearly half of the remaining candidates have joined him in calling for a complete ban on fracking, while the other half merely want to limit and regulate the technique.

We are more than a year away from the Nov. 2020 election, so we can expect the campaign rhetoric to get more extreme as the candidates pander to their base. In response to a question during CNN's climate town hall, Sen. Kamala Harris (D-CA) stated, "There's no question I'm in favor of banning fracking." Then, just two days later, Sen. Elizabeth Warren (D-MA), perhaps worried she was falling behind in the race for the most extreme climate position, tweeted, "On my first day as president, I will sign an executive order that puts a total moratorium on all new fossil fuel leases for drilling offshore and on public lands. And, I will ban fracking — everywhere."

Ban fracking everywhere. That sounds rational.

For people who claim that climate change caused by man-made CO₂ is the existential threat to this very planet, the Democrat candidates seem unreasonably obsessed with hydraulic fracturing, the technique that has led to a dramatic drop in "greenhouse" gases emitted in the United States over the past 10 to 15 years. But then, facts and logic are too much to expect during a presidential campaign.

This obsession with fracking is not good news for consumers, workers or the oil and gas industry. Based on the experience with the Bureau of Land Management's "Venting and Flaring" Rule, a ban on fracking on federal land would be devastating for North Dakota.

In comments on the BLM Rule, the North Dakota Industrial Commission stated that initially more than 97% of surface and mineral estates in North Dakota were privately owned. But, during the Great Depression, that all changed because many small

tracts were lost through foreclosure, and the federal government acquired a "patchwork" of small parcels throughout the state. Also, when many of those parcels were later sold, the federal government reserved a portion of the mineral estate.

The result is that while the federal government owns just 9% of the minerals in North Dakota, nearly 30% of the potential development areas in the Bakken have federally owned minerals. The patchwork of federal mineral rights was not an issue in the past, because spacing units were 160 acres or less so operators could more easily avoid federal land. But now, with tight oil plays like the Bakken, spacing units are 2,560 acres or more, and these large units routinely run into federal mineral ownership.

If a President Warren bans fracking on federal land, just a small 40-acre federal parcel, which could be two or more miles from a well site, will control the entire spacing unit. Operators will simply avoid those areas and deprive private mineral owners of the opportunity to develop the resources they own.

The impact will be felt from North Dakota and beyond. In a recent column, Ron Ness, President of the North Dakota Petroleum Council, gave the following facts on the impact of the oil and gas industry in the state:

- \$32.6 billion contributed to North Dakota's economy in 2017;
- 51,400 jobs supported;
- \$2.7 billion in state and local taxes paid;
- \$4.3 billion paid in private wages and salaries in 2018, 23.3% of all private wages and salaries paid in North Dakota;
- \$1.6 billion in royalties paid in the state in 2017.

Of course, fracking is not just important in North Dakota. Workers, industry and consumers in Colorado, New Mexico, Texas, Pennsylvania and elsewhere continue to benefit from the shale revolution. How will the Democrat anti-fracking rhetoric play in those states and across the country? State and local anti-fracking policies have faced significant pushback, notably in Colorado.

When President Carter put on his sweater and asked us to turn down our thermostats to 65 de-

A BAN ON FRACKING WILL COME AT A TREMENDOUS COST AND HARDEST HIT WILL BE THE POOR AND ELDERLY

grees, his energy policy had coal as the primary source of electricity in the country. Today, based on the energy and climate positions of the candidates, this is the Democrat energy plan:

Natural gas? No. Oil? No. Nuclear? No. Coal? H*ll No. Wood? If you really need to, but only with an EPA approved stove.

That is not only radical — it is dangerous.

For those of us living in the northern half of the U.S., as we head into winter with a solar minimum, we think it is appropriate for voters to pump the brakes on their EVs before we ban hydraulic fracturing. A ban on fracking will come at a tremendous cost and hardest hit will be the poor and elderly among us. And the promised benefit to our environment will never be realized. Winter is coming, stay warm.



About the author: Bette Grande is a Research Fellow for energy and environment issues at The Heartland Institute. She served as a North Dakota state Representative from 1996–2014. Grande was a member of the House Appropriations Committee, Education and Environment Division. She was born and raised in Williston, North Dakota.

River City Dental Solutions



Your
Premier
Center For Smiles

- General, Cosmetic & Implant Dentistry
- Trusted, Comfortable & Affordable Family Dental Care
- The Latest Procedures, Instruments & Techniques
- Always Welcoming New Patients
- Most Dental Insurance Accepted

Dr. Thomas C. Shields would like to welcome Dr. Joseph Perry to the practice.

7300 Blanco Road, Suite 203, San Antonio, TX 78216

 CALL: 210-349-3745





Oil and Gas Investing Redefined

By: Jay R. Young

In the new shale-dominated world, we all know that the industry is changing. With threats ranging from geopolitical issues to the rise in electric vehicles and alternative fuel sources, we need repeat investors now more than ever if we're going to stay in business. If we turn people off by doing deals in which they lose money over and over, why would they ever want to invest again? Given all of this, I knew I had to start doing something differently about the way we did business at King Operating Corporation.

The way the vast majority of oil and gas investment deals have traditionally been structured has left limited running room and little diversification. If something goes wrong — and in a complex system like drilling for oil, things can certainly go wrong — there are few ways to fix it without pouring more money into a literal hole in the ground. In these types of cases, it becomes nearly impossible for investors to recoup their investment.

After speaking to a lot of people in a variety of industries about how they did business and how they approached investors, I realized that all people really want is a genuine shot. Most want to be treated not just as 'money,' but as true partners. They aren't interested in a guarantee — some of them are rightfully wary of any empty "promises." Rather, they want to believe they've got a real shot to make a profit, or at least make their money back. With this in mind, I knew that I needed to structure this type of oil and gas investment project for them.

In 2015, after speaking to my good friend David Moore, who's been very successful within the real estate industry, King Operating Corporation created the ADD (Acquire, Develop, Divest) model for our oil and gas investment projects. This investment model works for sponsored oil and gas transactions and, in my opinion, represents a total change in the way much of the smaller, independent companies in the oil and gas industry oper-

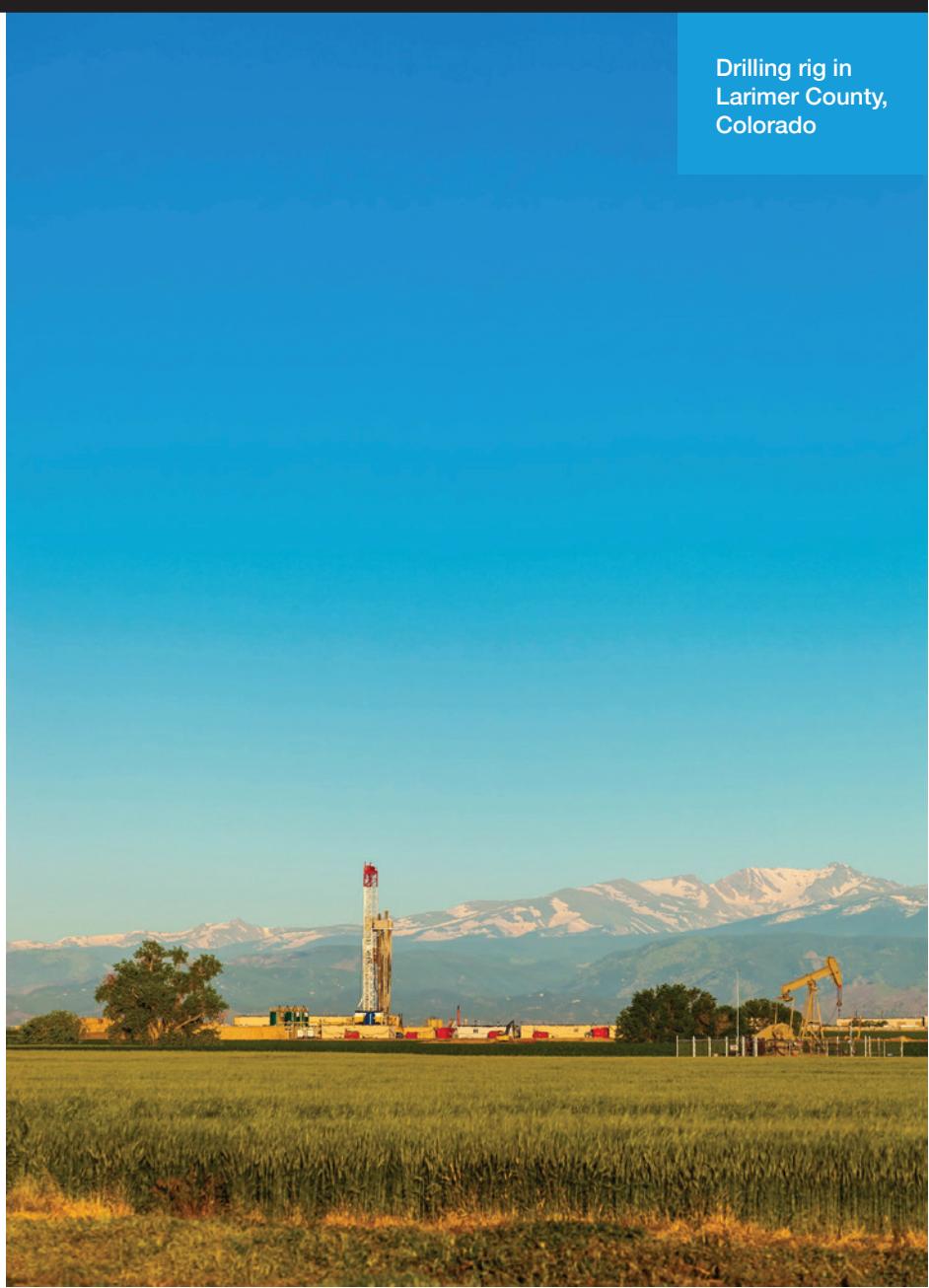


PHOTO COURTESY OF KING OPERATING CORPORATION

ate. Instead of buying one location, drilling and hoping for the best, the operator buys a large volume of acreage, proves up a well and sells it off, while the investors come along for the entire ride.

By doing things this new way, without having to drill all the wells, projects can also be completed faster. It allows for a better opportunity with a quicker turnaround time and for money to go back into the investors' pockets faster, while ideally starting another project with the same investors on board.

This new model essentially means that the unknown factor, the performance of the wells, is not as critical to the initial investors. In fact, by selling off the acreage to companies who want to drill, this new model has removed investors from the operation before it gets potentially dicey and goes on to something new. At the end of the day, it doesn't matter whether a well gushes or trickles; if the sponsor has been able to sell off the acreage at a higher price than the original acquisition price, the investors will have already made back their money.

The second part of this is that, because we want our investors to be with us for the long term, from project to project, we treat them like full business partners. The goal here is to build true investor partnerships, not solely just looking for money. And, it will not surprise you to hear that when people are treated with respect, they're a whole lot more likely to reinvest with a company. As a result, we've enjoyed repeat investors for several of our most recent projects.

To illustrate our ADD Model, I've provided an example of how our next investment project in Larimer County, Colorado will be structured:

- King Operating and investors invest \$100 million into the fund.
- The fund leases up to 40,000 acres to drill and complete up to 200 wells. We want the scalability to develop multiple wells in multiple formations, but our goal is NOT to drill all of them. We want to leave this upside for the buyer.
- After we've completed the leasing, we begin drilling and reworking wells in the fund.
- With the purchase, we bought an oil field that has produced over 8 million barrels of oil in the Muddy "J" formation. With current reserve reports, the field shows there are 5-22 million barrels of oil left in this field. If it produces 10 million barrels of oil, at \$55 a barrel, the fund generates over \$500 million which we feel covers our initial investment of \$100 million. We will only use a fraction of the money to prove up remaining reserves and utilize the remaining to increase the size and value of our investment.
- Our team of engineers, geologists and geophysicists will be searching for many other opportunities within the acreage. The oil-bearing Niobrara and Codell both produce in the immediate area.

Once the initial work is performed, we will go to the market and look to divest the asset. If the market is not there, we could look to divest a portion of the asset and drill more wells or use the asset as collateral to obtain a loan and then "drill, baby, drill."

We strategize to come up with three exit strategies over the life of the project because we never truly know the timing with the markets or

THERE COULDN'T BE A BETTER TIME TO INVEST FOR THOSE WHO ARE INVESTING IN OIL AND GAS TODAY

the oil and gas prices. While we certainly cannot guarantee our future projects will be successful, in my opinion, the new investment model gives our clients a better chance to make positive returns.

I do believe that if we're to continue being successful and making sure that the United States no longer has to rely on foreign oil deposits and can become self-sufficient when it comes to the energy sector, we will still need people to continue investing in oil and gas by offering people smarter investment opportunities. When you combine the cutting-edge technology for extracting hidden oil with the way we're doing business now and the global demand for oil, getting in the game today could set you up for many, many years to come. The good news: I truly believe there couldn't be a better time to invest for those who are investing in oil and gas today and are doing it the right way.

Oil is not like real estate; we can't just slap on another coat of paint and up the price. We have to make sure that we're getting the most value up-front the first time. The second a drop of oil comes out of the ground, the value drops. So we need our investors on board from the very beginning by structuring deals in a way that ensures that we all start on a level playing field with the same goal in mind.

At the end of the day, what I really want is for everyone to get a fair shake and a fair opportunity to make back what they put in, and more. I know that if we're going to continue to be successful, and if the industry is going to continue to thrive — even with the new pressures of electric vehicles and emerging alternative energy sources — we're going to need our investors.



About the author: A fourth-generation oil and gas professional, Jay Young is the founder and CEO of King Operating Corporation, a privately owned, Dallas-based oil and gas operator. King's business model specializes in strategically acquiring oil and gas projects to further develop, divest and maximize investor returns. Jay graduated with a BBA from Angelo State University and is active in a number of local and national philanthropic organizations.



Pitfalls of the Incomplete Background Check

By: Matt Jaye, Vice President of Sales, Corporate Screening

Today's companies recognize the importance of conducting employment background checks. Background checks are an important component of most hiring practices. According to a national survey of HR professionals, 96% of employers conduct at least one type of background screening.

Whether organizations seek to verify previous employment and educational credentials, check references, or identify criminal history, performing a complete background check helps bring transparency to the hiring process and reduces risk for the company, its employees, and customers.

Background checks come in a variety of shapes and sizes depending on the industry and type of position. However, conducting a thorough background check takes more than simply selecting an off-the-shelf background screening solution.

HR professionals need to be aware of the pitfalls of an incomplete background check, both for the integrity of the hiring process and to reduce risk to the company in the long and short term. Here are some of the common pitfalls of incomplete background checks and how to avoid them:

1. Downplaying the Risks

Background checks aren't simply for identifying individuals who have committed a federal crime or who have been terminated for company misconduct. There are many other aspects of an employee's history that require verification and investigation.

One staffing industry survey noted that about 46% of employees said they knew someone who lied on their résumé. A thorough background check can identify individuals who have misrepresented their education or professional credentials, those who have provided false references, and those with post-employment criminal convictions.

Downplaying the risks associated with poor or incomplete background checks can

open organizations up to negligence claims, reputational risk, and dangerous activities in the workplace. Companies can successfully manage these risks by choosing a comprehensive screening program provider that not only identifies troubling past behavior but also thoroughly verifies the background information candidates and employees provide.

2. Conducting One-Size-Fits-All Checks

Just as the recruiting process may vary for different types of positions in different functions, the background check process can vary depending on position or industry.

For example, employees in positions requiring interaction with children or the elderly or those involving direct patient care within the healthcare field will require exclusion and debarment checks as required by the U.S. Department of Health and Human Services and other bodies. Employees in financial services may require a credit check as part of a comprehensive background screening.

Given all the variations between types of positions and the possible categories to check, companies must do more than simply enter an employee's address and Social Security number in an online portal and wait for a feedback report. Instead, take the time to determine the individual background check needed for each segment of the employee population. This ensures the right aspects of individual backgrounds are checked thoroughly and in accordance with applicable laws and regulations.

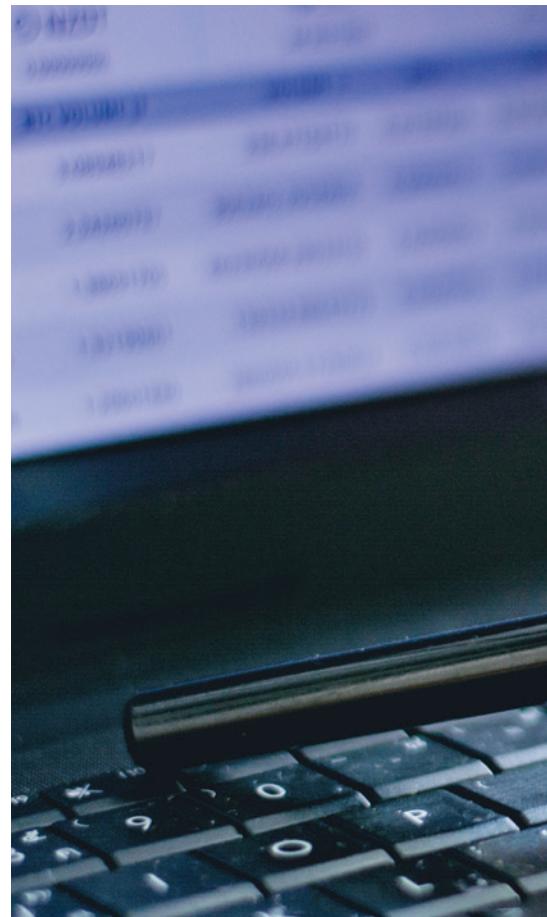
3. Following an Incomplete Verification Process

Not all background checks are created equal, and many do not go far enough. To ensure background checks uncover employee misrepresentations or omissions, it's important to select a background check provider that helps overcome the following mistakes:

- **Not covering all of the bases:** Background checks don't need to be limited

to educational, criminal, and employment history. Key elements of a pre-employment screening should also include professional licenses and certifications, consumer credit reports, motor vehicle records, and a Social Security fraud check.

- **Insufficient check attempts:** It's important to be cautious of background check providers that follow a "three and out rule" specific to employment and education ver-





HR PROFESSIONALS NEED TO BE AWARE OF THE PITFALLS OF AN INCOMPLETE BACKGROUND CHECK, BOTH FOR THE INTEGRITY OF THE HIRING PROCESS AND TO REDUCE RISK TO THE COMPANY IN THE LONG AND SHORT TERM



About the author: Matt Jaye is Vice President of Sales for Corporate Screening, a Cleveland, Ohio-based provider of global background screening and Human Resources outsourcing (HRO)-related solutions that was established in 1987. Jaye, a member of the Professional Background Screening Association (PBSA) and the Society of Human Resource Management (SHRM), has been with Corporate Screening for more than 20 years.

This article was originally published on HRDA, <https://hrdailyadvisor.blr.com/>



GIFT GIVING ETIQUETTE TO BRING CHEER TO THE HOLIDAY SEASON

By: Lauren Guerra



G

ift-giving can be rewarding, but it can also be stressful. No one wants to make the faux pas of giving an insensitive, unwanted or lame gift to a friend or loved one. However, trying to find a gift within a budget, sending a positive message, and providing usefulness to the recipient can be like finding a needle in the haystack. Worse so, those dreaded "secret Santa" gifts with an unknown recipient — how on Earth do you shop for an unknown person with unknown interests?

BEST OF LUCK AND HAPPY HOLIDAYS

Thankfully, I have some strategic planning ideas to help you in your search for the perfect holiday gift this season.

#1: IT'S NOT A GIFT FOR YOU

One of the greatest mistakes you can make is picking out a gift you would like. The gift is not for you. I don't mean to say you can't or shouldn't like the gift — rather, your opinion of the gift is basically irrelevant.

The gift should take into account the person who will be receiving — and hopefully enjoying — the gift. Consider them as a person. Do they have a particular interest or hobby that you know of? How can their daily life be made more enjoyable through an item you can gift? Is there an inside joke that has a special meaning you can use to bring a smile to their face during the stressful holiday season?

#2: PAY ATTENTION

The clues are there if you look for them.

Your husband may have recently mentioned an interest in joining a golf club. Your wife may have recently noted her need for a new robe as hers is quite literally a faded and sad mess. A friend may have recently found an interest in comic books. Whatever the case may be, a little careful thought is all that is needed to come up with quite a few ideas to widdle down to a perfect gift idea.

Gifts for less-than-close recipients can be harder to shop for, but a little intentional awareness can give some great clues. Perhaps you are doing an office gift exchange and your recipient is not someone you know particularly well. Try to glance over at his or her desk. Is there anything missing that would be helpful to him or her — maybe you can see he or she really enjoys a particular sport, color, hobby, etc.

#3: SEND THE RIGHT MESSAGE

One dangerous pitfall of gift-giving can be to unintentionally send the wrong message. Maybe you think your friend could use some new skincare products — sounds like a nice, thoughtful gift for a woman — but a woman that is self-conscious about aging issues may look into the gift as a nod to those unwanted fine lines.

Again, this really goes back to tip numbers 1 and 2. Paying attention and being thoughtful to your friend's opinions and needs will serve you well this holiday season.

#4: CONSIDER ITS SHELF LIFE

Gifts can either have a short or long shelf life.

A short shelf life gift may be a consumable gift such as food or beverage, or something that will quickly run out.

A long shelf life gift can be used for days, months, even years.

Neither gift option is right or wrong — it's really about your relationship to the person, the message you want to send, and what you think is most appropriate and useful. It is my opinion, long shelf life gifts, especially those with sentimental value or memories, are best for close relationships. For an acquaintance or a friend you aren't very close with, a short shelf life gift such as a bottle of wine or cheese basket can be more appropriate.

#5: IT'S THE THOUGHT THAT COUNTS

It's important to remember, budget is not a constraint. If finances are tight, consider a DIY or lower-cost sentimental gift to show care. The measure of a gift is not in its monetary value — rather, its value is measured by its likeability, usefulness and thoughtfulness.

In fact, gifts of high monetary value can blow up in your face in certain situations. Consider this, if you gave a friend a very nice watch, for example, as a gift and his gift to you is a moderately priced bottle of wine there is an imbalance, causing an awkward exchange.

In the case you are giving a high-value item: First, expect nothing in return, to avoid disappointment and embarrassment; second, consider including a card or message with an explanation of why you felt compelled (give thanks, appreciation, etc.) to give such an extravagant gift.

Lastly, gifts can also be your time, which is free. Instead of a toy for the kids, give them a voucher for one afternoon trip to the park and ice cream with dad, alone and without interruptions. Those special memories are gifts for you both.

There you have it, folks. Now it's up to you to use these tips to shop for the right item for your friends and loved ones. Best of luck and happy holidays!

About the Author: Lauren Guerra is the Chief Operating Officer and Editor-in-Chief of SHALE Magazine. For editorial inquiries, please email lauren@shalemag.com.



OPERATIONAL EXCELLENCE IN OIL & GAS SUMMIT

Over 300+ oil and gas senior industry leaders attended the Operational Excellence in Oil & Gas Summit in Houston, Texas on November 4-6, 2019. Bringing together over 300 of the industry's most innovative thinkers for 10 consecutive years, the summit aimed to show delegates how to develop the culture, systems and processes of the world's highest reliability organizations. The event brought together Heads of Operations, HSE, Technology, Operational Risk and Operational Excellence all in one location to close performance gaps and reduce human, asset and environmental risk. The days were filled with case study speaking sessions, panel discussions, interactive group discussions, pre-conference workshops, networking time and a fantastic cocktail reception hosted by Vintri Technologies.

A few key highlights from the summit:

- CIO's from Albermarle, Delek US, Laredo Petroleum and more spoke on driving disruptive innovation, a digital supply chain and data-driven transformation
- VP's and Directors shared their insights and operational excellence journeys through deep dive case studies with BP, Olin, Koch, Hess, Dow Chemical and many more on how to build a High Reliability Organization
- There was a special focus on unconventional operational excellence which included case studies from BPX Energy, Crestwood Midstream, Apache, American Midstream Partners and more
- There was an exclusive NASA Johnson Space Center site tour and safety culture workshop where participants gained insight into how NASA trains its astronauts to optimize attentiveness, improve reaction time and minimize operational risk

For more information on the summit, scan the QR code to request the event guide to be sent directly to your inbox or contact our team directly: Leslie Allen on enquire@iqpc.co.uk or +1.705.707.1301



SHALE

MAGAZINE

Delivering insight into the development of the
U.S. oil and natural gas industry and the businesses affected



FOR ADVERTISING INFORMATION PLEASE CONTACT:

KYM BOLADO / kym@shalemag.com / 210.240.7188
www.shalemag.com

- @shalemagazinetexas
- Shale Oil & Gas Business Magazine
- @shalemag



OTHER SERVICES OFFERED BY SHALE MAGAZINE

Branding / Web Production / Search Engine Optimization / Ad Design / Social Media
Video Production / Public Relations / Email Marketing / Campaign Strategy / Direct Mail

SHALE Magazine is a statewide industry publication that showcases the significance of the South Texas petroleum and energy market. SHALE's mission is to promote economic growth and business opportunities that connect regional businesses with oil and gas companies. The publication supports market growth through promoting industry education and policy, and its content includes particular insight into the development of the Eagle Ford Shale and Permian Basin plays and the businesses affected.

PERMIAN BASIN MIDSTREAM MIXER

SHALE Magazine and In the Oil Patch co-hosted the Permian Basin Midstream Mixer with the Texas Alliance of Energy Producers at the DoubleTree By Hilton Midland Plaza on Oct. 30 at 6-8 pm. Guests enjoyed appetizers and networking while the Astros game played. Great door prizes were provided by SHALE, Port Corpus Christi, and Aggreko. Oilfield Helping Hands Permian Basin had a table with information to share with attendees as well. Sponsors of this event included Port Corpus Christi, Aggreko, and LJA Engineering!



PHOTOS COURTESY OF SHALE

HOUSTON ENERGY DAY

Over 28,000 people visited Energy Day at Sam Houston Park on Saturday, Oct. 19. CEEF and Energy Day provided bus grants to 67 Houston-area school groups and students and teachers from 13 Houston-area school districts enjoyed the fun. The organization gave away nearly \$23,000 in awards to more than 200 K-12 students and teachers at the Energy Day award ceremony. In attendance, Mayor Turner revved up the crowd by encouraging our STEMMERs to work hard in school and reach for the stars in the Energy Capitol of the World...Houston!



PHOTOS COURTESY OF CEEF

WOMEN SUPPORTING WOMEN

SHALE Magazine attended the Women Supporting Women event co-hosted by Women's Energy Network South Texas and Women Empowered, an internal CPS Energy organization. The event featured a chat with Paula Gold-Williams, CEO of CPS Energy and Felecia Etheridge, Chief Customer Engagement Officer of CPS Energy. A panel followed the discussion, including Lisa Delsante, Vice President of Legal and General Counsel with OCI Enterprises; Janie Gonzalez, President and CEO of Webhead; Michael Johnston, Sr. Manager at Howard Energy Partners; and Julia Reinhart, Senior Vice President of Human Resources with Valero Energy Corporation. Kym Bolado, CEO of SHALE Magazine and host of In the Oil Patch radio show was the panel moderator.

PHOTOS COURTESY OF CPS ENERGY



SHALE & SAPA MIDSTREAM MIXER

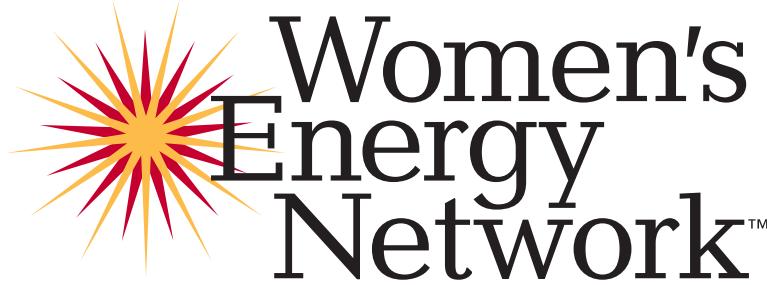
SHALE teamed up with the San Antonio Pipeliners Association (SAPA) for a Midstream Mixer on Sept. 24, 2019, at Fogo de Chao in downtown San Antonio. This event was sponsored by Port Corpus Christi, Aggreko, LJA Engineering, Oilfield Experts, USGP Energy and Amegy Bank. Guests enjoyed beer and wine, appetizers, and many door prizes.

PHOTOS COURTESY OF SHALE



FASTEST GROWING PROFESSIONAL GROUP FOR WOMEN IN THE ENERGY INDUSTRY

Join WEN today! www.womensenergynetwork.org/houston



About WEN

The Women's Energy Network (WEN) is an international organization of professional women who work across the energy value chain. Our mission is to develop programs to provide networking opportunities and foster career and leadership development of women who work in the energy industries.

Thousands of women are breaking ground in energy industry careers, and 3,000 of them are members of the Women's Energy Network. Members receive exclusive access to:

- Mentoring • Job Board • Group Discussions
- Member-only Networking Events • Expert Speaking Engagements • And more

Women's Energy Network | 1707 Post Oak Blvd., PMB 112 | Houston, Texas 77056

UNMATCHED TEXAS HUNTING RETREAT



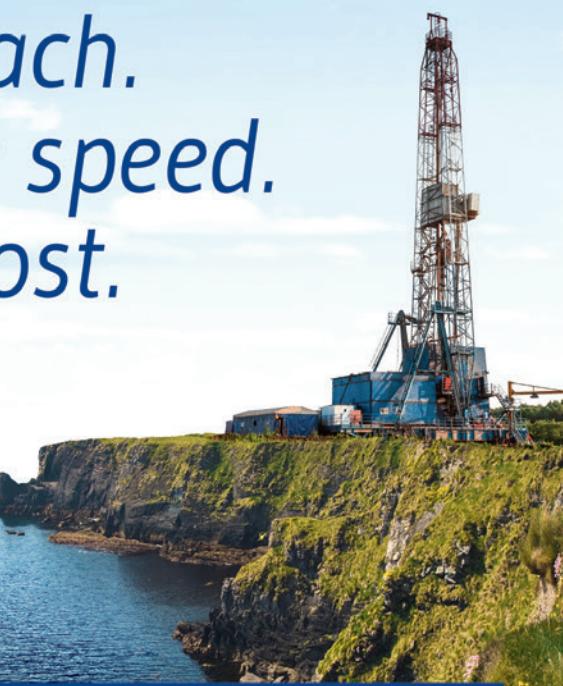
“ After hunting several ranches throughout South Texas over the last 15 years, I have finally found one that has it all. Fantastic accommodations, food and overall comfort are second to none. The number of quality animals is simply unbelievable. ”

- Bobby Phillips



LONESOMECOYOTERANCH.COM | (361) 215-9283

More reach.
More speed.
Less cost.



FuchsRohr® AluDrill™

The innovative aluminum drill pipe.
Your reliable solution for more drilling efficiency.

- High strength-to-weight pipes for demanding drilling surroundings: subsea and downhole, horizontal and directional
- Up to 50% weight advantage compared with steel pipes
- Suitable for standard pipe-handling equipment (API connections)
- Higher buoyancy: More efficient weight transfer to bit
- Substantial ROP increase in sliding and rotary mode

GO TO
EXTREMES!

More reach. More speed. Less cost.

*Let us help you make your
next Vegas trip spectacular!*



Hotel • Limos • Golf • Fine Dining • Shows • Night Clubs • Pool Parties • Guides
Bachelor Parties • Bachelorette Parties • Build Your Custom Package • VIP Packages

In the
Oil Patch
with SHALE
MAGAZINE

SHALE
MAGAZINE

TURNT UP
VEGAS

For booking email: party@turntupvegas.com
turntupvegas.com | 210.240.7188

**Not getting enough leads?
Technology is to blame.**



Get 10x* more qualified leads from your advertising with our enhanced reporting software package.

Gain unparalleled insight into who is interested in your ads and content.

Get a fast and free quote: SHALEmag.com/AC

*indicates results not typical

SHALE Magazine | (210) 240-7188 | 5150 Broadway #493, San Antonio, TX 78209



If you wanted to build the first supercar in America, apologies.
Acura just beat you to it.

Acura is smart. Which is why they're expanding in Ohio.

Because each new Acura NSX supercar is handcrafted with incredible precision, Acura needed the best master technicians in the world. Which is exactly what they discovered in Ohio. But don't take our word for it.

Take theirs.

See why Acura chose Ohio at jobs-ohio.com/Acura

Welcome to Ohio. It's on.





CHECK OUT.

THE
SPRINGS

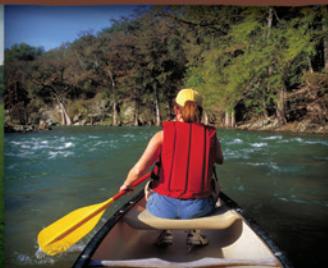
Cast your cares away along
the spring-fed Panther creek.

A kaleidoscope of colors out
your back window from
the towering Cypress trees.

Unplug and reconnect with
family at the new sports park.

The perfect place to catch a break.

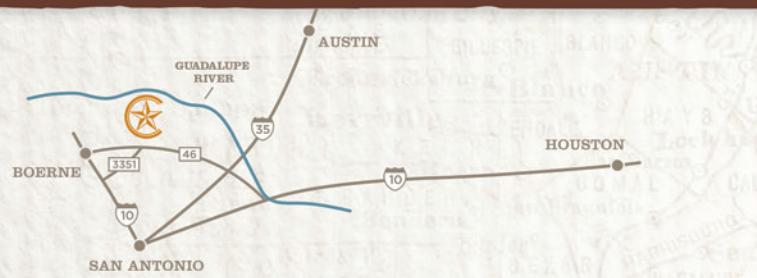
Joe Guiles
A SIGNATURE GOLF COURSE



Out here, when your energy runs low, you just plug into nature. Announcing The Springs of Cordillera Ranch—the newest addition to Cordillera Ranch. Extraordinary lots range from .75 acres to 3+ acres offering sweeping views of the Texas Hill Country, a network of hiking trails, the winding spring-fed Panther Creek, and lots of other reasons to check out early and come home.

Luxury Hill Country lots from the \$100's-\$300's+

www.CordilleraRanch.com | 888-66-RANCH



THE
SPRINGS of CORDILLERA
RANCH

Life is better out here.

Golf Club | River Club | Social Club | Spa & Athletic Club | Tennis & Swim Club | Rod & Gun Club | Equestrian Club



GAME ON

THERE WILL BE **1.9 MILLION NEW JOB OPPORTUNITIES** IN NATURAL GAS AND OIL BY 2035. POSITIONS THAT WILL INCREASINGLY BE FILLED BY WOMEN AND MINORITIES.

SCIENCE | TECHNOLOGY | ENGINEERING | MATH