RESERVOIR SOLUTIONS

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We've had a good run and it's not over yet

-- Mike Wysatta, Public Relations Manager

In the almost 24 years I have written and edited *Reservoir Solutions* newsletter, I rarely spoke directly to you, our readers. With this, my last newsletter, I can now thank you directly for reading the quarterly, in some cases, for decades. I'm retiring from Ryder Scott, but the firm will continue to publish a newsletter, so stay tuned. Please see details on Page 13.

"...our hard-copy newsletters started to show up in boardrooms and on desks of top management"

Retro approach

When I started at Ryder Scott in the late 1990s, I noticed that companies were abandoning the mailing of printed publications in favor of digital. In addition, I spent more time to go through junk emails than "snail mail."

With a contrarian strategy in hand, Ryder Scott began to mail printed newsletters — a clutter cutter — with a focus on the reserves evaluation sector.

From early on, our hard-copy newsletters started to show up in boardrooms and on desks of top management because of the editorial approach and our leadership in events that shaped our industry.

After the fall of Enron Corp. and Arthur Andersen LLP, now 20 years ago, the U.S. SEC took dead aim at energy companies. Subsequent rulemaking in Sarbanes-Oxley Act stoked fear of big government enforcement and criminal penalties, even though SOX did not apply to unaudited reserves estimates per se.

In December 2002, the newsletter headlines were as follows:

- **SEC engineer cites red flags in reserves reporting**
- **Ryder Scott meets the press, discusses field technology**
- **Industry argues for booking reserves without flow tests**
- **Ryder Scott deepwater survey confirms booking practices**
- **O'Shea sees more audits of engineering work**

During that time, we not only followed and reported on SEC issues, but were participants in the dialogue. As an independent reserves auditor, Ryder Scott

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preferred not to have “a dog in the fight,” between industry and regulators.

However, industry’s technical arguments, including ours, were so strong that we became an advocate of sorts, while never losing sight that our main job was to assist clients to be SEC compliant.

We used editorial license to practice “gonzo journalism” where the reporter is part of the story.

“...our editorial approach and leadership in events shaped our industry.”

For instance, Ryder Scott published a newsletter article on a presentation we delivered at an industry forum, calling for the SEC to drop the Gulf of Mexico flow test rule in 2002. Industry supported its position based on advancing technology, cost-benefit analyses and safety concerns.

Internet were Canadian firms.

“Marketing” was still a dirty word for some dyed-in-the-wool professional services firms. They continued to rely on word of mouth and referrals to drive sales. (Those traditional methods worked and still work today.)

Then, “public relations” was personal selling, e.g., taking colleagues to lunch and “glad handing.”

For decades, Ryder Scott top execs belonged to the downtown Houston Petroleum Club, an oil-and-gas hot spot for power lunches and gala events. It was the place to see and be seen.

As one source published, “Some of the deals that shaped the modern oil and gas industry were hatched at the bar and at dinner tables in Houston’s Petroleum Club.”

in a global marketplace.

Firms realized that sales calls were much costlier than “hits” on a website. “Virtual” success became just as important to the bottom line as referrals and face-to-face selling.

The newsletter kept our website current over the first decade of the 2000s up to the present day. That includes in 2006, when the U.S. shale revolution began.

Some 15 years later, industry is still learning. See blurb, “Shale plays as challenging as ever,” on Page 7.

The latest editorial shift now focuses on ESG with an emphasis on environmental. See articles on pages 4 and 5.

To you, with care

Each newsletter was scrutinized by our newsletter committees made up of CEOs, presidents and others, including me, who reviewed the drafts closely.

This has been a team effort all the way up to the top of our consulting firm that stayed the course with its long-term commitment to fund newsletter costs.

The SEC reviewed comments and abolished the regulation. That marked the beginning of the “modernization” of SEC oil and gas regulations.

After that, Ryder Scott was thrust into headline-making news. In 2004, Royal Dutch Shell admitted it had overbooked proved oil reserves by 4.5-billion barrels, about 23 percent of its total, wiping billions of dollars off its market value.

The debacle led to the resignation of Shell’s chairperson, head of the core oil and gas division and chief financial officer. Shell called in Ryder Scott to “clean up” the reserves bookings that year. Our firm conducted an accelerated review of the Shell reserves classifications.

The *Wall Street Journal* called Ryder Scott for interviews, citing a B2B newsletter that had covered reserves issues six years before the Shell writedown. *Dow Jones, Reuters* and others followed, and Ryder Scott gained recognition with the news media.

This was quite a change from the 1990s, when Ryder Scott was not widely known outside its industry sector. (During the go-go ‘90s, Wall Street investment bankers knew Ryder Scott for its reliable technical due diligence on IPO launches.)

The only reserves consultants with a presence on the

New reckonings

During 2000 to 2010 — a decade of rising oil and gas prices — globalization accelerated.

Broadening the field were partial privatizations of state-owned companies including those in China, continued economic growth in Russia, rise of AIM and other alternative markets, and passage of free trade agreements.

(The economic impact of 9/11 was minimal. Markets bounced back to new highs in a few, short months.)

“...we became an advocate of sorts, while never losing sight that our main job was to assist clients to be SEC compliant.”

In 2003, Ecopetrol SA restructured to list on the NYSE. We did due diligence for the partial privatization after the CEO contacted us through information in the printed newsletter.

A strange evolution happened on the way to the future. The relatively tiny evaluations sector became enmeshed

Under a steady game plan to report news on the evaluations sector, our circulation reached almost 10,000 recipients before industry layoffs ensued post 2014.

Instead of downsizing, we went big.

In 2014, an outside professional graphics designer joined our internal team. I no longer had to do what was a rudimentary layout of *Reservoir Solutions*.

With more time for editorial, I increased the copy and page count, and the newsletter became a magaletter.

Industry chronicled

So many other conditions and events surfaced in the last 2 ½ decades that touched our industry, sector and Ryder Scott. If you want to see how much has changed, go to https://ryderscott.com/newsletters/ and read the earlier articles.

One headline of June 2002 reads, “Unconventional U.S. gas resources could stave off shortages, but technical hurdles persist.”

That sums it up.

Ryder Scott plans to launch a newsletter with a new name, look and focus in the April issue.

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U.S. public issuers assess potential for material financial risks posed by climate rules

Oil and gas companies in U.S. markets are scrutinizing their climate-change policies and disclosures after receiving comment letters from the SEC last September.

***Utah Business* magazine reported in November that the government watchdog is primarily targeting "those in the oil and gas sector."**

The SEC received more than 550 responses, and could issue a climate change proposal as early as 2022.

The sample comment letter from the SEC refers to rules of more than a decade ago, the "2010 Guidance Regarding Disclosure Related to Climate Change, Release No. 33-9106 (Feb. 2, 2010)."

Through the letter, the SEC is pressuring public companies and serving notice that mandatory ESG rules are on the way, observers say. Companies are preparing in advance of the regulations.

The letter posed the following questions that resonated with publicly traded companies in the oil and gas industry:

1. What anticipated reputational risks may result from operations or products that produce material green house gas emissions?
2. Quantify any material increased compliance costs related to climate change.
3. If material, provide disclosure about your purchase or sale of carbon credits or offsets and any material effects on your business, financial condition, and results of operations.

If the climate proposal were final by 2022, then the SEC would likely schedule an effective date in 2023.

Last year, Chevron Corp. and others urged the SEC to support voluntary standards in the Task Force on Climate-Related Financial Disclosures. The standards take a markets-based approach to disclosing financial risks related to climate regulations.

The U.S. Financial Stability Board created the 2010 guidance for use by companies, banks, investors and government. FSB, an international body, makes recommendations on how to handle systemic risk in the financial sector worldwide. Gensler is a member.

Last year, majors and independents alike urged the SEC to continue to require disclosure of material changes and related financial risk, but to avoid climate change rulemaking.

The Western Energy Alliance and U.S. Oil & Gas Association commented that the SEC should "recognize its lack of statutory authority" to enact climate change regulation.

The American Petroleum Institute stated, "Any effort by the SEC that seeks to impose a major new climate disclosure regime but deviates from the well-established grounding in materiality could raise significant concern about whether the SEC has strayed far beyond its authority to regulate the securities markets."

Chronology of SEC Actions on Climate Change, Financial Risk

- **March 2021** — SEC announces enhanced focus on climate-related risks. The commission opened public comment on whether existing ESG disclosures are adequate in informing investors about known material risks, uncertainties, impacts and opportunities, and whether greater consistency is needed.
- **May** — The SEC Investor Advisory Committee approved recommendations urging the Commission to begin updating reporting requirements to include material, decision-useful environmental, social, and governance (ESG) factors.
- **July** — **Gary Gensler**, SEC chair, said he asked staff to develop a mandatory climate risk disclosure rule proposal for Commission consideration.
- **September** — The SEC sent **comment letters**. A Sept. 22 sample letter asked companies to disclose "the material effects of transition risks related to climate change."
- **December** — Gensler reaffirmed focus on climate disclosures.

SEC disclosure rules on GHG emissions require less reporting than other, related regulations

"Although some information related to greenhouse gas (GHG) emissions and climate change is reported in SEC filings, companies are reporting more in-depth data voluntarily or under other regulatory systems," said **Herman Acuña**, executive vice president and head of Ryder Scott ESG services.

As an example, he cited the Code of Federal Regulations 40 CFR 98, Mandatory Greenhouse Gas Reporting.

"The reporting landscape is rapidly changing. While reporting requirements may vary, the data and engineering principles behind the generation of the GHG statements by an entity remain materially the same," he said. "Establishment of the evaluation boundaries and inventories is key to the success of the evaluation."

Ryder Scott estimates GHG emissions through direct measurement, stoichiometric calculations and emission factors and follows guidelines of the International Petroleum Industry Environmental Conservation Association, International Association of Oil & Gas Producers and American Petroleum Institute.

Verification and validation (V&V) engagements will vary in scale and scope. Deliverables will include third-party ESG audits and independently certified sustainability reports.

Please see detailed article on V&V services in *Reservoir Solutions newsletter*, **July–September 2021, Page 8**.

Ryder Scott also analyzes renewable energy options and scenarios to determine optimum solutions.

For more information, contact Acuña at herman_acuna@ryderscott.com or **Sandeep Khurana**, head advisor–integrated services, at sandeep_khurana@ryderscott.com.

Environmental engineer joins Ryder Scott sustainable energy division

Manish Singh

Manish Singh joined Ryder Scott as a senior environmental engineer reporting to **Herman Acuña**, who heads the sustainable energy division. Manish has more than 25 years of experience in managing GHGs and Air Quality issues, including compliance with regulations and protocols. Before joining Ryder Scott, he was a contractor in corporate consulting at Hess Corp.

Before that, he was a senior environmental consultant and principal corporate auditor at Occidental Corp. for almost nine years.

His experience in climate change, sustainability and ESG in the upstream is as follows:

- Developed corporate-wide carbon footprint for three emissions scopes of the Greenhouse Gas Protocol (GGP). Developed metrics/targets for the GGP emission scopes per guidelines of API, World Resources Institute, IPIECA, etc.
- Developed carbon-footprint reduction strategies and evaluated green technologies.
- Refined processes for collecting, vetting, estimating and documenting GHG and air quality data.
- Assisted in preparing corporate sustainability reports and disclosures under various frameworks and standards.
- Tracked carbon policies.
- Familiar with certifications of ISO standards.

Singh began his engineering career in academics and government before joining El Paso Corp. in 2001. He was a principal environmental engineer for more than five years. Singh also held that title at TransCanada Corp. during 2007 to 2011.

He has worked on projects in or related to Canada, Colombia, Bolivia, Mexico, Oman, Qatar, UAE, Yemen, Libya, Guyana, Denmark, Malaysia, Thailand, India and the U.S.

Singh has a BS degree in mechanical engineering from the Birla Institute of Technology, India, and an MS degree in environmental engineering from Louisiana State University.

His initial work assignment was to complete the accreditation process of the American National Standards Institute for ISO 14065:2020 requirements for Ryder Scott.

The standards apply to bodies validating and verifying environmental information.

Recent SPE ATCE paper presents first "official" case study of learning curve

Ryder Scott documented learning curve in shale plays four years before 2018 PRMS guidelines

Eight years ago, Ryder Scott built a database of the Wolfcamp play in the Permian Basin to examine correlations between recoveries and drilling-and-completion and reservoir variables.

The firm noticed that despite thick, reasonably consistent upper, middle and lower sections in Wolfcamp, drilling results were not consistent from operator to operator.

Ryder Scott assigned reserves to some locations in Wolfcamp that were significantly lower than what the firm estimated for reserves in adjacent locations.

The answer was at hand. The Wolfcamp database showed the strongest correlations were between recovery levels and operator. That logically addressed the cumulative knowledge and operational practices of each operator.

Ryder Scott was onto something then — the effect of a learning curve. In simple terms, the more someone performs a task, the better he or she gets at it.

Now "machines" in iterative processes provide reliable analysis through machine learning.

The learning-curve phenomena, first formalized in 1885, was introduced by the PRMS in 2018, giving producers valid arguments for boosting future net cash flows and reserves based on the curve.

The PRMS stated, "In oil and gas developments with high well counts and a continuous program of activity (multi-year), the use of a learning curve within a resources evaluation may be justified to predict improvements in the time taken to carry out the activity, the cost to do so, or both."

Latest ATCE paper breaks ground

Ryder Scott staff wrote an SPE technical paper of a case study that factors in the learning curve concept in the PRMS, making it the first published study to do so.

Lead author **Jeremy Xia**, senior engineer, said, "The recommended workflow in our paper will enable evaluators to book PUD reserves more appropriately, but not necessarily more PUD locations. I mention this because there is a tendency to believe the learning curve usually leads to positive results."

The paper, "Integrated Workflow for Reserves Evaluation in Permian Basin based on Monograph 3," is available at onepetro.org.

Other contributing authors are **Eric Nelson, Larry Connor, Dan Olds** and **He Zhang** — all from Ryder Scott.

"Monograph 3 does not fully address most situations and challenges in the paper, and some of them are common," said Xia.

The recommended workflows that lead to reliable resources reporting are not enshrined in the PRMS or blessed and codified by regulators.

Background, premise

In 2011, the Society of Petroleum Evaluation Engineers (SPEE) published Monograph 3 as an industry guideline for reserves evaluation of unconventionals, especially for probabilistic approaches. However, stochastic methods are not applicable during the early stages of field development, state the authors.

"From the start of a project, evaluators can only book reserves based on adjacent locations using the traditional analogy method, which, along with volumetric analysis, are used in evaluating conventional reservoirs," the paper states.

The authors considered more than 300 shale well locations in the Permian Basin. They identified analogous wells based on location, geology, and drilling-and-completion (D&C) technology. The next step in the workflow was to estimate technically recoverable resources (TRRs) of analogous wells.

The authors developed five type wells, identified drilling opportunities and conducted a Monte Carlo simulation to develop a statistical distribution for undeveloped locations in each type-well area.

The paper illustrates the construction of type wells and statistical distributions in some of 22 figures (charts) in the paper. Zhang presented the paper at the 2021 ATCE in Dubai.

Workflow

The use of probit plots and binning strategies were key in developing the type wells. Categorizing wells in accordance with their characteristics is referred to as "binning" in Monograph 3.

"That step can be subjective when done by inexperienced reserves evaluators, which may cause inconsistent, highly variable reserves evaluation results," stated the paper.

A common mistake in binning strategy is to include too many type wells based on a single criterion, which usually results in a very small sample size for each type well and indistinguishable differences in type well bins.

The authors illustrated this problem in a binning strategy that just considered well locations.

To determine the number of drilling opportunities, the authors had to consider similar ownership and operations management to factor in the learning curve.

Monograph 3 recommends using anchor wells to determine proved areas of a resource play.

The paper stated that the anchor well method to define a geological proved area is time consuming and offers limited benefits to enhance the reliability of evaluation results.

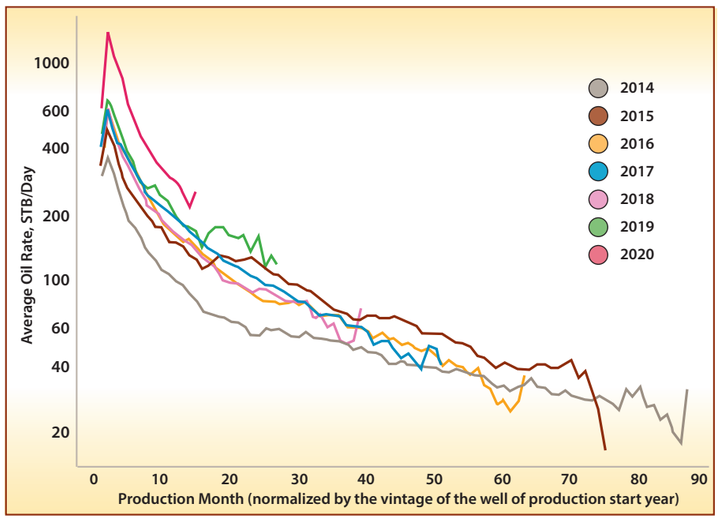
Consequently, the authors visually examined undeveloped well locations on a series of bubble maps and used their professional judgments based on knowledge and experience. Visualization was vital to the study.

Following the workflow steps in Monograph 3, the authors developed a lognormal distribution for the type wells.

When categorizing volumes, a common error is to multiply the number of undeveloped wells by the mean value from a log-normal distribution. This implies that the mean of the distribution is achieved regardless of the number of wells drilled. Fewer drilling locations create a greater risk of achieving the mean with fewer wells.

The Monte Carlo method yielded P10, P50 and P90 values and the per-ft P values were multiplied by the lateral lengths for each location to calculate 1P+1C, 2P+2C and 3P+3C TRRs.

Over a 10-year period, wells from 2011 to 2013 (not shown in chart) had much lower oil production rates than wells drilled and completed after 2014. Please see the following chart on this page with learning curve influence on production after 2014.



Those performance metrics established D&Cs as a primary benchmark for learning-curve applications. The statistics incontrovertibly show successful optimization of D&C strategies.

Monograph 3 does not address cases where sample sizes are smaller than recommended minimum numbers. However, evaluators might exclude noticeable outliers and proceed with caution.

The authors concluded that new concepts have evolved since the publication of Monograph 3, including the learning curve concept in the PRMS. It is especially relevant where well production performance is enhanced with optimized D&C technology.

The SEC has not commented on this concept to date.

Shale plays as challenging as ever

Over the past few years, news media, investors and others have singled out some overly optimistic production forecasts based on type well profiles (TWPs) in the Permian Basin and other unconventional plays.

In 2017, SPEE set out to provide guidelines on TWPs. Ten society volunteers working on the monograph set a "soft" deadline of a year to complete a draft while conceding the goal was optimistic.

Some five years later, mid-2022 is an "unofficial" target to finalize a draft of Monograph 5, "A Practical Guide to Type Well Profiles."

Keeping it simple

Perhaps the problem is not that convoluted. The SPEE monograph committee reported a year ago that a tweak to a common approach has led to more reliable TWPs, and that is to normalize production curves while keeping the well count constant.

The modified Arps hyperbolic model is still the most widely used method to develop decline curves for tight formations. If built properly, the model works well.

Discoveries must have "significant quantities"

Steve Phillips

Steve Phillips, head of Ryder Scott G&G, presented "The Significance of Significant or Just Give Me a Number" at the Ryder Scott annual webinar.

The title differentiates between "significant" accumulations (justified discoveries) and not so significant — those not on a pathway to reserves.

"It takes experienced judgement to discriminate between minor or background hydrocarbon occurrences and deposits with commercial potential that are 'significant,'" said Phillips.

Misused terminology in public statements can confuse. In one example, a company touted an exploration project with a hyped-up press release, pointing out an "astonishing thickness of reserves."

Later, the company disclosed it found no traces of oil and discontinued the operations.

Phillips expanded on the principles-based definition of "discovery" in the 2018 PRMS guidelines. Central to this definition is that a discovery has to have a "significant quantity of potentially recoverable hydrocarbons."

"Many exploration geologists have heard or said something to the effect that finding a 'teacup' of oil counts as a discovery," said Phillips. "This adage contradicts the PRMS guidance that the 'chance of geologic discovery' must anticipate the 'chance of development,' which is key to the overall goal of commerciality."

The definition leaves lots of room for misleading non-technical stakeholders and the public.

"The PRMS guides honest reporting of exploration project results," said Phillips. "This is one area where our ongoing commitment to ethics must lead the way for the technical work and public disclosures."

Why we fool ourselves

Some detectable levels of hydrocarbon concentration can be widespread in the subsurface, Phillips noted. In some wells, gas chromatography from mud logging may indicate thick intervals with trace levels of methane (denoted as C1) in a given sedimentary basin.

Surface geochemical prospecting may indicate the same.

"Thermal and biological generation and migration processes can be active over large areas," said Phillips. "However, concentration of hydrocarbons in conventional and unconventional reservoirs with commercial potential require favorable, relatively localized conditions."

He clarified what constitutes a discovery through four examples of non-discoveries. Pitfalls included no gas to surface, low recovery of oil, no traces of claimed oil, and misleading terminology that sidesteps commerciality.

All four cases are summarized in the **presentation slides**.

In looking at the mining sector as a parallel for the oil industry, Phillips noted that metal ore deposits are generally assumed to require a certain concentration above the average background levels in the earth's crust.

"However, this alone does not make a deposit significant," said Phillips.

He cited the textbook, "Physical Geology", by **Steven Earle**, who writes, "It's important to note that the economic viability of any deposit depends on a wide range of factors including its grade, size, shape, depth below the surface, and proximity to infrastructure, current price of the metal, the labor and environmental regulations in the area, and many other factors."

As in hard rock mining, no single petroleum reservoir factor can predict commerciality.

Phillips provided examples from a Ryder Scott internal database, stating, "The range of potentially commercial reservoir characteristics is very wide and careful technical analysis must be combined with thoughtful application of resource definitions."

For instance, the same quantity that might be significant in one case, say a shallow onshore reservoir near infrastructure, might be far from sufficient in a remote deep water play.

Exploration wells are typically drilled with hopes that the upside or, at least, the mean-case outcome will be realized.

Phillips asked, "How often are internal standards for minimum thresholds of key reservoir properties defined in advance of the project?"

He recommended consideration of exploratory well operations as an indicator of discovery status. In simple terms, data generated by a well must demonstrate that an in-place quantity of petroleum can be reliably estimated and has real potential for commercial recovery.

In looking at the mining sector as a parallel for the oil industry, Phillips noted that metal ore deposits are generally assumed to require a certain concentration above the average background levels in the earth's crust. The Morenci deposit, discovered in 1856, initially exploited high concentration metal ores by subsurface mining. Eventually, open pit mining was implemented to recover ore with copper concentration below 0.3 percent. For commercial exploitation, copper deposits typically need to exceed 0.5 percent and preferably, meet a 2-percent threshold. The lesson is that multiple factors contribute to commerciality.

Ryder Scott is certified in ISO 9001 and 14001 standards

When the auditor becomes the audited

Ryder Scott received independent certifications that it meets ISO 9001:2015 and ISO 14001 standards. The International Organization for Standardization (ISO) sets the requirements.

ISO 9001:2015 defines quality management systems (QMSs) based on documented procedures. ISO introduced 9001 in 1987. ISO 9001:2015 further defined the requirements for a QMS.

To earn and maintain ISO 9001:2015 active status, a company must show sustainable, continuous improvement of the quality of its products, processes and services.

ISO 14001 defines prerequisites for environmental management systems (EMSs). It does not address environmental performance. Instead, it maps out a framework that a company can follow to set up an effective EMS.

The requirements of ISO 14001, which meet European Union standards, set a higher bar for performance improvement, legal compliance and reporting duties.

Third-party inspectors conduct surveillance audits of certified companies in years one and two after the initial certification. The third year requires a recertification audit to maintain status. Years one and two after the recertification are subject to more surveillance audits.

Dekra was the independent auditor and certifier for Ryder Scott.

Dekra calls itself, "… the world's largest, unlisted, expert organization in the testing, inspection, certification industry." It is the largest inspection company in Germany.

Certifications demonstrate a company is compliant with other standards around the world.

"This took over a year of hard work and dedication to become certified," said **Dean Rietz**, CEO. "We had to create the necessary guidelines and policies to navigate through the certification process. I would like to highlight and thank **Herman Acuña**, executive vice president, for his efforts and oversight to make this happen."

Ryder Scott oilfield success was company maker

Early events in the oil industry led up to the emergence of Ryder Scott Co. and its work rejuvenating flagging production in the Bradford field in Pennsylvania in the mid-1930s.

The nation's oil boom began in the state. Production rates of the Bradford field peaked in 1881 when companies extracted 23-million barrels of oil that year or 83 percent of the country's entire output, stated the American Refining Group.

Thirty-five years later, the field was averaging only 40 barrels a day. Producers turned to waterflooding to squeeze more oil from the "played out" field.

Seeing an opportunity, Forest Oil Corp., a startup oilfield consulting company in 1916, promoted a process that involved the "injection of fluid into the oil reservoir to create energy to produce additional oil."

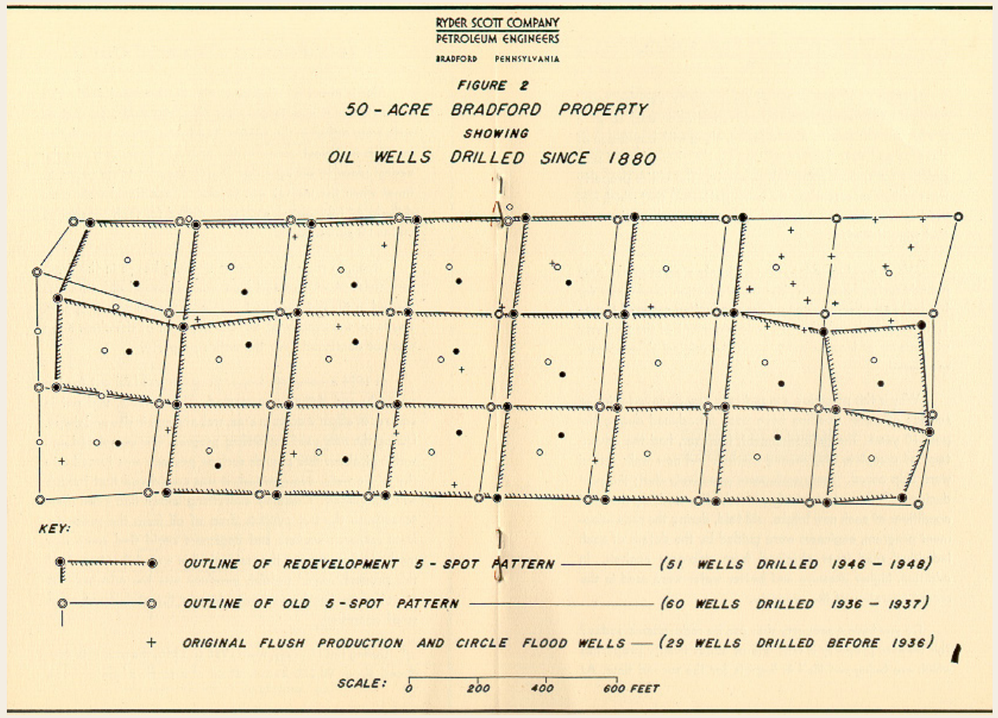
A history posted on the Forest website states that "within five years, Forest Oil was widely recognized throughout the oil and gas industry as not only the innovator of waterflooding, but the authority and leader in secondary oil recovery systems."

However, an upheaval in the oilfield services marketplace began to take shape in the mid-1930s. Producers in the Bradford field noticed that Ryder Scott Co., also an operator there, was out-producing everyone.

Soon after, in response to widespread demand, Ryder Scott exited the producing sector and launched its own full-time consulting firm.

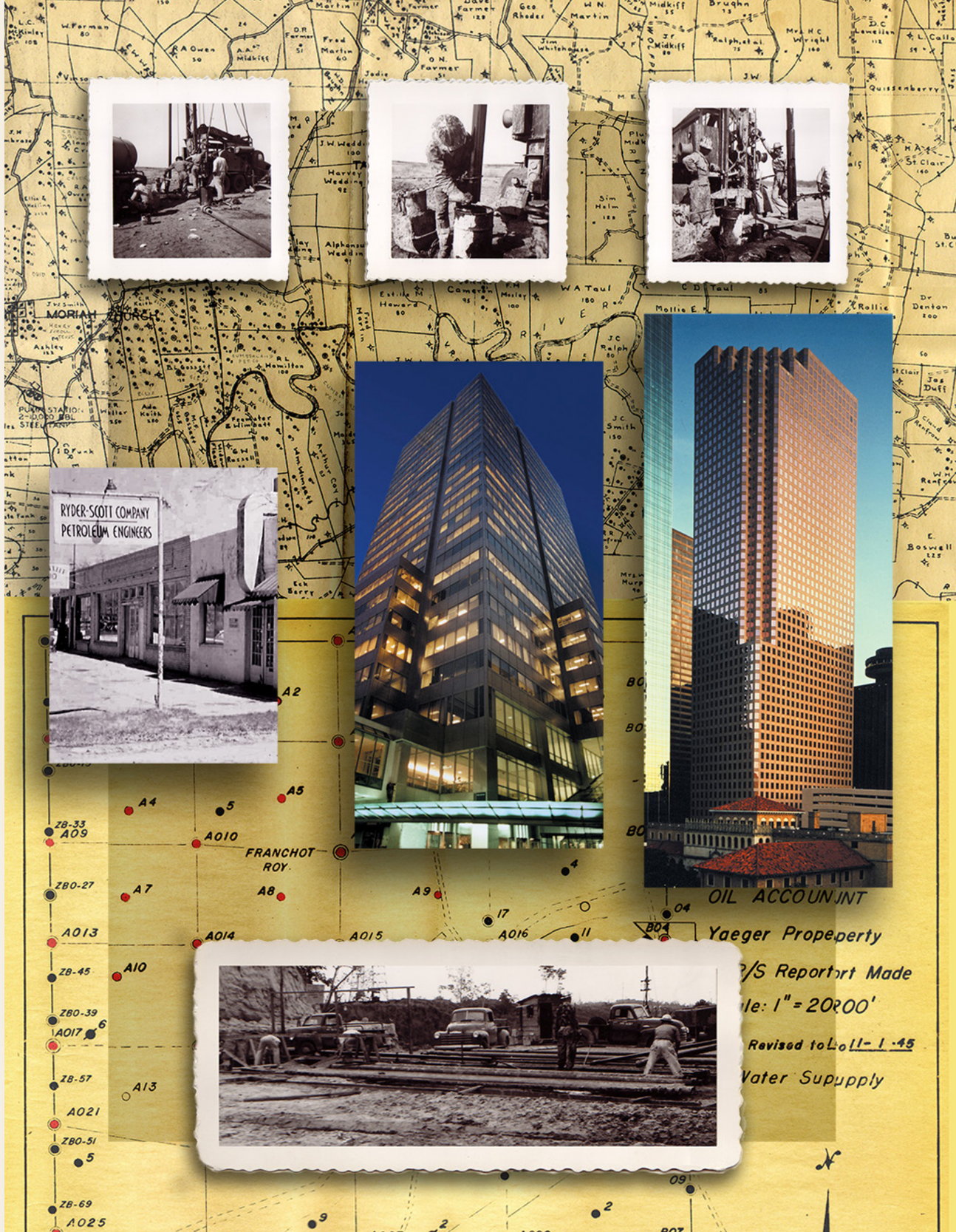
Ryder Scott quickly overtook Forest as the No. 1 consultant in secondary recovery. In fact, Forest became the first Ryder Scott client.

Please see Ryder Scott oilfield success on page 12



***Left** – This Ryder Scott map shows five-spot well patterns in a Bradford field property from 1880 to 1948. During that time, production peaked, hit bottom and climbed again after the firm re-engineered secondary recovery operations in the 1930s and 1940s.*

***Right** – Today, Ryder Scott bears little resemblance to the core laboratory of the 1930s. However, the firm still retains the principles of its founders — that oil and gas projects be evaluated and engineered to the highest professional and ethical standards.*



Ryder Scott oilfield success – Cont. from page 10

Donald T. May, head of the Ryder Scott core lab, recalled those days in an interview with *Reservoir Solutions* more than 20 years ago.

He said, "The operators were watching Ryder Scott. We were doing a Ryder Scott lease right next to Forest Oil. We way outdid them. They couldn't imagine what was happening. Forest Oil was recognized as a good waterflooder, but our deal was much better, and it was all due to chip coring. We could get the right answer and knew where the oil was to go after it."

That the firm was able to find sweet spots in producing trends is not surprising. Leading the way was the lab and its analysis of well logs and chip cores from cable tool drilling.

Contributing heavily to the engineering side was founder **Harry M. Ryder**, an engineer with previous oilfield experience at partnership Ryder & Richmond Corp.

Founder Ryder addressed concerns of producers in Q&A session in 1937

He advised producers to use reliable pressure data

In the mid-1930s, Ryder Scott Co. was a producing company in Pennsylvania. The firm was so successful that other operators in the Bradford field began asking for technical assistance. Oil was only a couple of dollars a barrel, so founders **Harry M. Ryder** and **David Scott Jr**. figured that they could be more profitable as partners in a consulting firm.

Donald T. May confirmed the business plans of the partners in an interview with *Reservoir Solutions* newsletter more than 20 years ago.

May was Ryder Scott's first hire in 1935, and it paid off. May headed up the first laboratory in the world devoted to solving waterflood problems.

Speech kicked off Ryder Scott consulting service

Ryder made a speech at a meeting at the request of the Kentucky Oil & Gas Association in 1937. That was the same year he incorporated consulting firm Ryder Scott Co. in Bradford, PA.

A letter from the association asked Ryder to review questions in writing from members ahead of the meeting.

Ryder said he was honored that the meeting organizers had asked him to lead the discussions on repressuring. He made the presentation in Lexington, KY, on June 4, hundreds of miles from Bradford.

Sharing his field-tested knowledge and introducing his new company were likely priorities for the trip.

Ryder and **C.C. Hogg** of the National Petroleum Co. debated the finer points of repressuring. Though not specific, Ryder said he respected the opinions of Hogg but did not always agree.

Hogg chaired the Production Advisory Committee, which aimed to map the oil sands of Kentucky and establish recovery factors to benefit producers there.

The most common repressuring medium at that time was air and air-gas mixtures. Air is not suitable for repressuring wells because it deteriorates oil and is combustible in some wells.

Ryder was aware of those shortcomings, saying that when air drags the oil, gas and gasoline are removed (lost). He added that air oxidizes the oil, increases the viscosity, makes oil more difficult to move and becomes problematic to refine.

Following are his closing remarks to the audience:

DISCUSSION ON REPRESSURING
In the Form of Questions by Producers
With Answers by **Harry M. Ryder**
Lexington, KY
June 4, 1937

Cores, laboratory logs and gauges are interesting, but utterly worthless unless they are put to work, and they are able and willing to do heavy duty, if given a chance. They are worse than useless, if incompetently handled.

A flow gauge reading taken at a key well will not be correct, if, at the moment, the line pressure is dropping, and may be worse than no reading at all. The reading of an open flow gauge will vary depending on the amount of oil over the sand, the time allowed for it to reach a steady state, when the well was last pumped and on other conditions, and all this must be taken into consideration.

If best results are to be obtained on any repressuring project, it seems worth repeating. Too much emphasis cannot be placed on care, thoroughness and competence in planning the project, the actual repressuring development of the lease and finally the continuous observation of the movements of the air, gas and oil and prompt applications of corrective measures as they appear.

If this idea is carried through consistently, the greatest possible returns will be the reward.

Ryder Scott to continue to inform industry through new newsletter

— **Dean Rietz**, *chairman and CEO*

Ryder Scott is changing editors of our flagship newsletter, *Reservoir Solutions*, as our outgoing editor, Mike Wysatta, retires. Please see the Page 1 article written by Mike.

We owe a big thank-you to him. Mike is a well-known staple in the reserves sector. His coverage has kept us abreast of the latest industry trends, news and important events over his many years at Ryder Scott.

Mike was very valuable to our Ryder Scott family. He had a knack for providing commentary on some highly technical topics while keeping the language concise and conversational to maintain reader engagement.

As one steps down, another steps up

Reflecting industry as a whole, a new, diverse generation is now guiding our newsletter. Our subject matter experts are our geophysicists, geologists and petroleum engineers.

They may not even be aware of their contributions to the newsletter. However, with every technical paper they write, or every presentation they make, they are helping to augment newsletter coverage and content. This has always been an important aspect of the Ryder Scott newsletter and will remain essential moving forward.

For instance, this issue features an article on a recent SPE paper written by Ryder Scott authors who introduced a case study of the learning-curve concept in the PRMS.

Like Mike, the new editorial staff knows that content is king, so, in some respects, expect continued coverage of technical presentations and papers in the newsletter.

Please let me introduce the new editor, **Pamela Sabo**. Many of you may already know the name since she has been at Ryder Scott for more than 20 years.


Pamela Sabo

Pamela has worn many hats during her tenure. She began her career at Ryder Scott in 2001, fresh out of college, with a bachelor's degree in mathematics and minor in computer science from the University of Texas at Austin.

She started in my group as a technician in the reservoir simulation department. Pamela moved through the ranks of technician, senior technician and analyst during the next 15 years.

She has always enjoyed working with others and when an opportunity arose in 2016, Pamela accepted the challenge to switch to business development as the coordinator.

In 2019, she became business development and sales manager after emerging as our No. 1 job candidate. Ryder Scott also had looked for an editor inside and outside our company, but in the end, Pamela's comprehensive understanding of our business, her natural writing abilities, and her

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We've had a good run – Cont. from page 3

For my part, I am leaving much wiser than when I started out in the industry in the 1990s, as a mid-career change.

I'm looking forward to simple pleasures punctuated with a few adventures. I won't stray too far away from a keyboard though. Ink runs through my veins.

You've been a good audience. Thanks for hanging in there with me. The future is yours.

*Editor's Note: Ryder Scott wants to hear from you, our readers, with comments and suggestions for future editorial content. Please send an email to **Dean Rietz**, CEO; **Pamela Sabo**, business development manager; and **Mike Wysatta** at info@ryderscott.com.*

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tremendous work ethic and attitude made her the right choice for the position.

Pamela recently received an MBA degree in marketing from the University of Houston.

You will notice some changes to the format and layout of our upcoming April newsletter, thanks to the hard work of in-house designer, **Deborah Corral**. **Emily Ammons**, business development coordinator, and **Sarah Sameei**, technical writer, are also on Pamela's staff.

She aims to increase content from staff contributions. Also, expect a new name for *Reservoir Solutions* newsletter.

Please reach out to Pamela with any suggestions, comments or observations via email at pamela_sabo@ryderscott.com.

Ryder Scott to commemorate 85th anniversary with a coffee table book this year

Ryder Scott plans to print and distribute coffee table books with photos and a history of the firm to celebrate its 85th year as a consultant. Oil historian **William R. Brice**, professor emeritus of geology and planetary sciences at the University of Pittsburgh at Johnstown, is doing research and writing an early history on a pro-bono basis.

Mike Wysatta, retired public relations manager, will edit and help write the book. **Ron Harrell**, chairman emeritus at Ryder Scott, is also doing research and writing.

Ryder Scott plans to print and distribute the books during Q3 to celebrate its 85th anniversary.

Dean Rietz, chairman and CEO, greenlighted the project and said he looks forward to producing a book rich in content and historical images to share with clients and colleagues.

TOP WORK PLACES 2021 HOUSTON CHRONICLE

Ryder Scott is a top workplace, say employees

Ryder Scott won a **Top Workplaces 2021** honor from the *Houston Chronicle* newspaper. The award is based on a third-party survey measuring employee feedback. More than 55,000 employees from 2,768 companies participated in the nomination process.

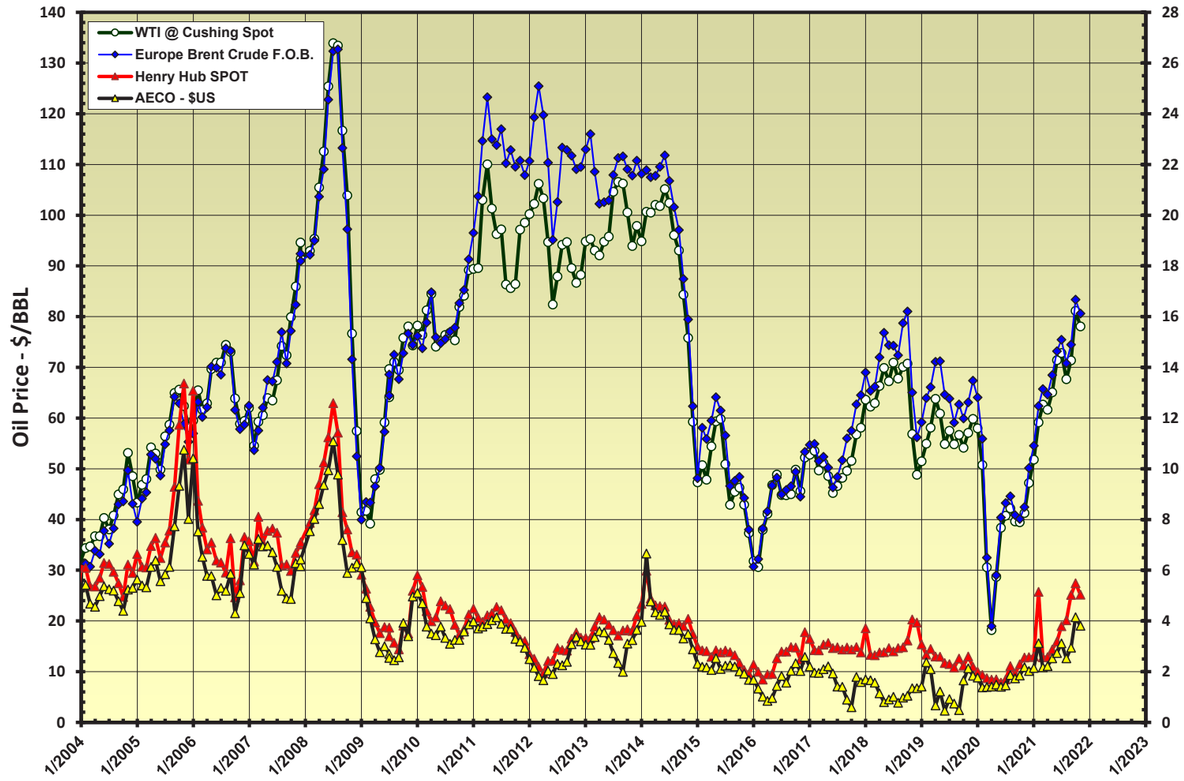
Only 175 companies climbed to the top, including Ryder Scott. The firm had a 66-percent response rate with 140 comments.

Ryder Scott's ranking was published in a special section of the *Houston Chronicle* on November 14.

The survey measures 15 drivers of engaged cultures, including alignment, execution and connection.

"You understand that it takes more than simply striving to be the best – it takes an attitude that we are all in this together," **Dean Rietz**, CEO, told employees. "Like a winning team. Like a tight-knit family. We care about each other."

Price History of Oil & Gas Benchmarks in U.S. Dollars



Published, monthly-average, cash market prices for WTI crude at Cushing (NYMEX), Brent crude and Henry Hub and AECO gas.

Publisher's Statement

Reservoir Solutions newsletter is published quarterly by Ryder Scott Co. LP. Established in 1937, the reservoir evaluation consulting firm performs hundreds of oil and gas reserves studies a year. Ryder Scott multi-disciplinary studies incorporate geophysics, petrophysics, geology, petroleum engineering, reservoir simulation and economics. With 119 employees, including 80 engineers and geoscientists, Ryder Scott has the capability to complete the largest, most complex reservoir evaluation projects in a timely manner.

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