



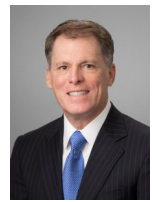
Weekly E&P Update

March 26, 2024

Vol. 13

Geologic Hydrogen: Promising But Distant

By Steve Hendrickson
President of Ralph E. Davis Associates



In a [previous edition](#) of our newsletter, we described the search for so-called "white" or "gold" hydrogen. Almost all the hydrogen we currently use is [manufactured](#) by either the steam reforming process (using methane as a feedstock) or water electrolysis. Both are energy-intensive processes, so there is strong interest in finding naturally occurring accumulations.

In May of last year, La Française d'Énergie, a French company engaged in the production of natural gas resources primarily from coalbed methane, was conducting research as part of a [project](#) called "REGALOR" to evaluate the potential for coalbed methane in the Lorraine region. They investigated the presence of pockets of natural gas, called "[firedamps](#)," but they found [evidence of gas](#) in a carboniferous-aged aquifer containing high hydrogen concentrations. At approximately 3,000 feet, concentrations were measured at 15% and estimated to reach 98% at 10,000. However, the lower depths have not been sampled, so the higher concentration is purely speculative. A more extensive mapping of the potential hydrogen resources of the region is expected to take two years.

Early estimates put the size of the discovery at 46 million metric tons of hydrogen, but I've seen reports as high as 250 million tons (a metric ton is 1,000 kg). To put that in perspective, according to [one analysis](#), a hydrogen fuel cell vehicle can travel 60 miles per kilogram of hydrogen. A typical internal combustion engine (ICE) vehicle with a 30 mpg fuel economy would need 2 gallons of gasoline to travel the same distance. Using this as a basis of comparison indicates that the lower estimate of the resource potential of the Lorraine discovery could be equivalent to over 2 billion barrels of oil.

Technology is not a panacea, however, and there are [some serious drawbacks](#) to producing naturally occurring hydrogen. Some of the challenges that must be overcome include low deliverability and high processing costs, especially if the concentration of hydrogen is low. So, while the discovery has generated a lot of buzz, even if it is ultimately confirmed, it's far from impacting decarbonization efforts.

Table Of Contents

[This Week in Oil & Gas](#)

[US Commodity Prices](#)

[Industry Headlines](#)

[Recent Transactions](#)

[Rig Activity by US Region](#)

[Deal Value by US Region](#)

[Total US Rig Count by US Region](#)

[US Daily Crude & Dry Natural Gas Production](#)

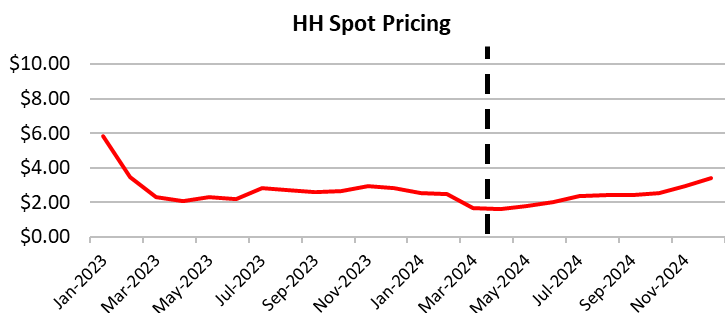
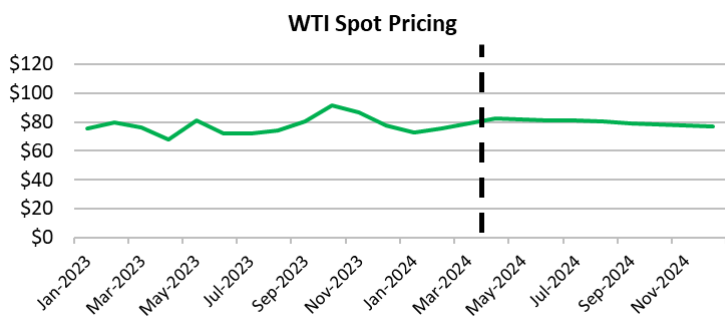
[Historical Production of US Shale Regions](#)

[Upcoming Events](#)

[About Us/Key Contacts](#)



NYMEX FUTURE PRICING



MONDAY'S MARKET CLOSE

NYMEX WTI CRUDE OIL FUTURES as of March 25, 2024 Close (\$/bbl)

Period	Current	WoW Change	Last Week	1 Yr Ago
2024	\$79.62	(\$0.50)	\$80.12	\$66.69
2025	\$73.91	(\$0.06)	\$73.97	\$64.57
2026	\$69.72	\$0.02	\$69.70	\$62.77
2027	\$66.99	(\$0.01)	\$67.00	\$61.06
2028	\$65.28	(\$0.09)	\$65.37	\$59.40

NYMEX HH NATURAL GAS FUTURES as of March 25, 2024 Close (\$/MMBtu)

Period	Current	WoW Change	Last Week	1 Yr Ago
2024	\$2.38	(\$0.09)	\$2.47	\$3.68
2025	\$3.41	(\$0.07)	\$3.48	\$4.25
2026	\$3.74	(\$0.06)	\$3.80	\$4.33
2027	\$3.77	(\$0.04)	\$3.81	\$4.30
2028	\$3.71	(\$0.05)	\$3.76	\$4.30

INDUSTRY METRICS—QUICK SNAPSHOT

	Current	Last Week	WoW Change	%Change
Crude Oil Near-Month Price (\$/bbl)	\$81.94	\$81.03	\$0.91	1%
Natural Gas Near-Month Price (\$/MMBtu)	\$1.61	\$1.69	(\$0.08)	(5%)
Weekly Upstream-Deal Transaction Value (\$MM)	\$386.00	\$0.17	\$385.83	>1,000%
Weekly Number of Upstream-Deal Transactions	5	1	4	400%
Current Total US Rig Count	624	629	(5)	(0.8%)
US Field Crude Oil Production (MMbbl/day)	13.1	13.1	0	-
US Field Dry Natural Gas Production (Bcf/day)	105.3	105.7	(0.4)	(0.4%)
Commercial Crude Oil Stocks-Excluding SPR (MMbbl)	445	447	(2)	(0.4%)
Natural Gas Stocks-Working Gas Underground Storage (Bcf)	2,332	2,325	7	0.3%
Total Drilled But Uncompleted Wells (DUC-Last Month)	4,483	4,483	0	-

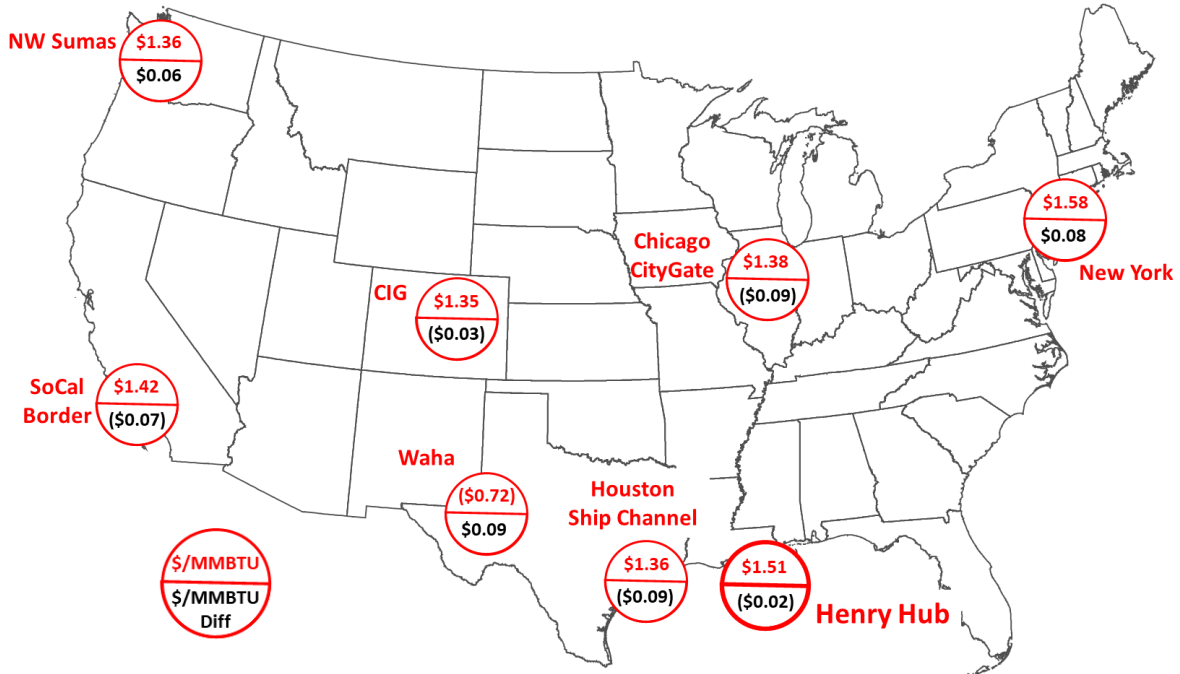
*Source—Energy Information Administration, United States (EIA)

*Source—Baker Hughes North America Rotary Rig Count & PLS M&A Database

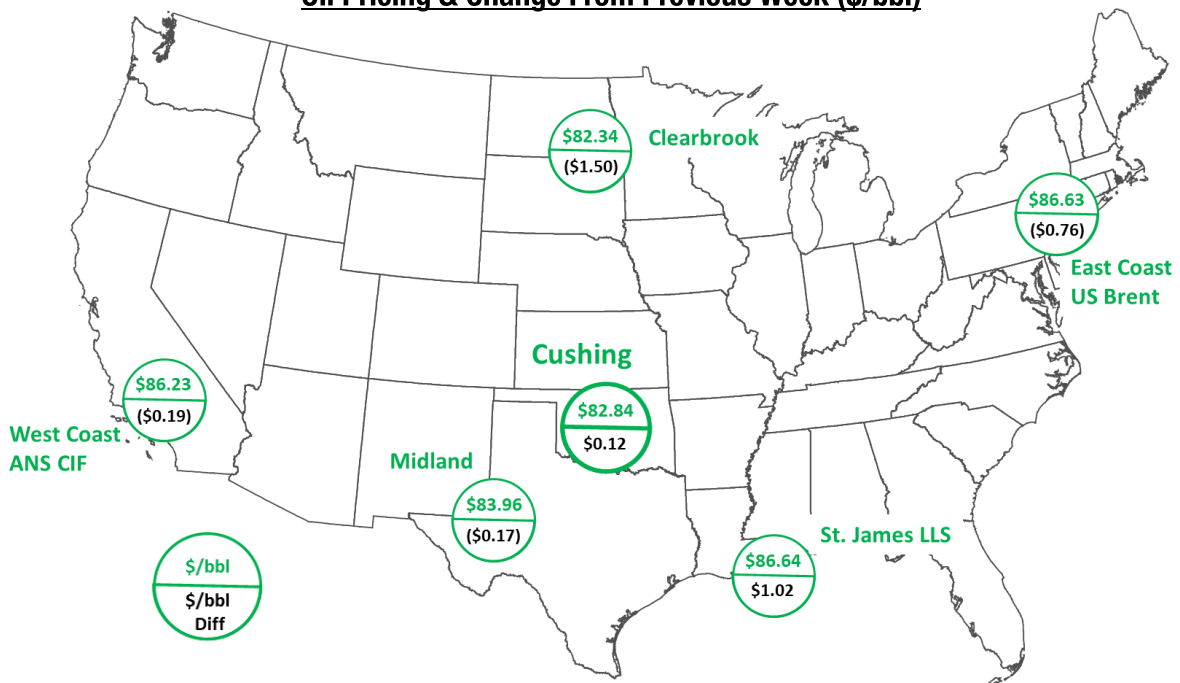


US COMMODITY PRICES CONTINUED

Natural Gas Pricing & Change From Previous Week (\$/MMBtu)



Oil Pricing & Change From Previous Week (\$/bbl)



*Source—Bloomberg LP



SELECTED INDUSTRY HEADLINES

Oil Settles Higher as Russia Orders Output Cuts, Geopolitical Rensions Persist

Oil prices settled higher on Monday as orders from the Russian government to curb oil output, and attacks on energy infrastructure in both Russia and Ukraine offset the United Nation's demand for a ceasefire in Gaza.

Record U.S. Oil Production and the Potential Impacts

Domestic oil production in the U.S. reached a new record in November 2023, hitting 13.31 million barrels per day, according to data from the U.S. Energy Information Administration.

Oil Demand Outpaces Expectations, Testing Calculus on Peak Crude

The world is using more oil than ever and demand is outpacing expectations again this year, raising questions about how soon global consumption will peak.

Oil Rises on Geopolitical Unrest and Signs OPEC+ Will Hold Firm (LOGIN CREDENTIALS REQUIRED)

Oil futures rose on geopolitical unrest and signs that OPEC+ will stick with current output cuts when delegates hold a review session next week.

Natural Gas Intrastate Pipeline Capacity Additions Outpaced Interstate Additions in 2023

In 2023, 5.2 billion cubic feet per day (Bcf/d) of natural gas intrastate pipeline capacity was added in the United States, according to our recently updated Natural Gas Pipeline Projects Tracker.

U.S. Energy Secretary Tells Skeptical Executives Natural Gas Export Pause Will be Short-lived

The Biden administration this week sought to reassure skeptical oil and gas executives that a pause on liquefied natural gas exports from new projects would be short-lived and would not alter the industry's meteoric growth.

North American Rig Count Down 43 Rotary Rigs

US drilling for natural gas decreased this week, down 4 rigs to 112. The number of rigs drilling for oil declined by 1 to 509. Nat gas prices

US Gas Producers Shrug Off Low Prices, Bet on LNG Boom

Energy executives say they are looking past current ultra-cheap gas prices and betting on a coming wave of new liquefied natural gas (LNG) plants to lift demand - and prices - for the fuel.

Winter's Supply Overhang Weighing on April Natural Gas Bidweek Prices (LOGIN CREDENTIALS REQUIRED)

Baseload natural gas prices were trending lower for April delivery as excess end-of-winter inventory levels kept bidders hesitant on the first day of bidweek trading Friday.

As Commercial Launch Looms, CEO Highlights "Huge Step Change" in Geothermal Interest

The developer of the recently emerged anchorbit technology is preparing to drill its first geothermal well next year in Germany.

Energy Transition Breakthroughs Will Come From the Silicon Valley of Energy, Bill Gates Says

Billionaire investor Bill Gates sees Houston, the Silicon Valley of energy, as a leading player in the global energy transition.

Gas Industry Leans on Emissions Tech as Climate Crackdown Looms

With electricity demand set to spike, U.S. energy companies are aiming to make sure natural gas is part of the world's fuel mix for decades to come.

3 Big Questions Will Shape US Energy Sector

Last week's gathering of energy executives here exposed competing visions of the future U.S. energy mix: either a future supply of abundant low-carbon power or one dominated by fossil fuels to accommodate spiraling demand for electricity.



SELECTED RECENT TRANSACTIONS

TotalEnergies to Acquire Upstream Position in Eagle Ford Shale

Global energy company TotalEnergies is expanding in the US shale patch with an upstream acquisition in the Eagle Ford of South Texas, chairman and CEO Patrick Pouyanné.

Diversified Energy Buys NatGas Assets in Runup to LNG Exports

Diversified Energy will pay \$386 million to buy 100% interest in Oaktree Capital Management's assets in Oklahoma, East Texas and Louisiana.

Civitas, Prioritizing Permian, Jettisons Non-core Colorado Assets

After plowing nearly \$7 billion into Permian Basin M&A last year, Civitas Resources is selling off non-core acreage from its legacy position in Colorado as part of a \$300 million divestiture goal.

Epsilon Energy Bolsters Permian Presence With Pradera Fuego Acquisition, Eyes Future Drilling

Epsilon Energy's acquisition in Ector County, Texas, underscores its strategic focus on expanding crude oil production in the Permian Basin, positioning the company for growth and operational efficiencies.

Esperanza, Andros Capital Partners to Acquire ExxonMobil's Interests in Ursa, Princess Fields

Esperanza Capital Partners and Andros Capital Partners LLC have announced the execution of a definitive purchase agreement to acquire Exxon Mobil Corporation's assets in the Ursa and Princess fields in the Gulf of Mexico.

Chord Energy, Canada's Enerplus to Combine Into \$11 Billion Company in North Dakota's Williston Basin

Chord Energy Corp. and Canada's Enerplus Corp. said late Wednesday they have agreed to merge in an \$11 billion stock and cash deal with an eye toward establishing a "premier" position in North Dakota's Williston shale basin.

Benchmark Buys Revolution Resources' Anadarko Assets in \$145 Million Deal

Benchmark Energy II is acquiring Revolution Resources just over four years after Revolution bought out Jones Energy Inc.'s Midcontinent portfolio.

Bayswater Acquires New Oil and Gas Production, Drilling Assets in DJ Basin

Bayswater Exploration & Production, a Denver-based oil and natural gas development company, recently acquired assets that will continue to expand its operations in the Denver Julesburg Basin in Weld County, Colorado.

Diamondback Agrees to \$26 Billion Deal to Buy Endeavor Energy in Growing Permian Push

Shale producer Diamondback Energy said on Monday it would buy the largest privately held oil and gas producer in the Permian Basin, Endeavor Energy Partners, in a cash-and-stock deal valued at about \$26 billion, including debt.

California Resources Corporation to Combine With Aera Energy

California Resources Corporation announced the signing of a definitive merger agreement to combine with Aera Energy, LLC in an all-stock transaction valued at approximately \$2.1 billion.

Vital Energy Closes Deal to Acquire Additional Interests in Permian Basin Assets

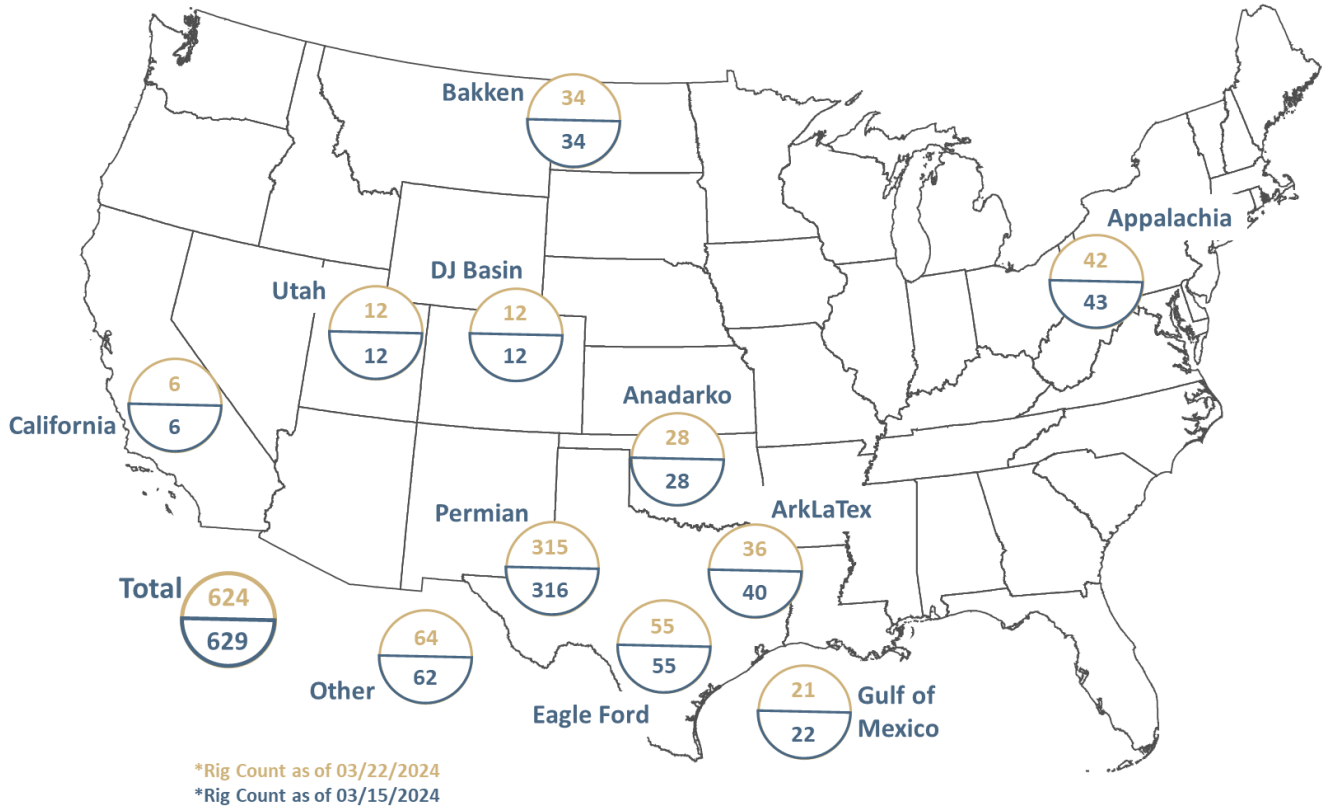
The \$78-million deal gives Vital Energy additional working interests in producing assets associated with the recent asset acquisition from Henry Energy LP, Moriah Henry Partners LLC, and Henry Resources LLC.

Silver Hill Energy Partners to Buy Liberty Resources' North Dakota Assets

Silver Hill Energy Partners said it would acquire Liberty Resources II's interests in oil and gas properties and all of Liberty Midstream Solutions in North Dakota for an undisclosed amount.



RIG ACTIVITY BY US REGION

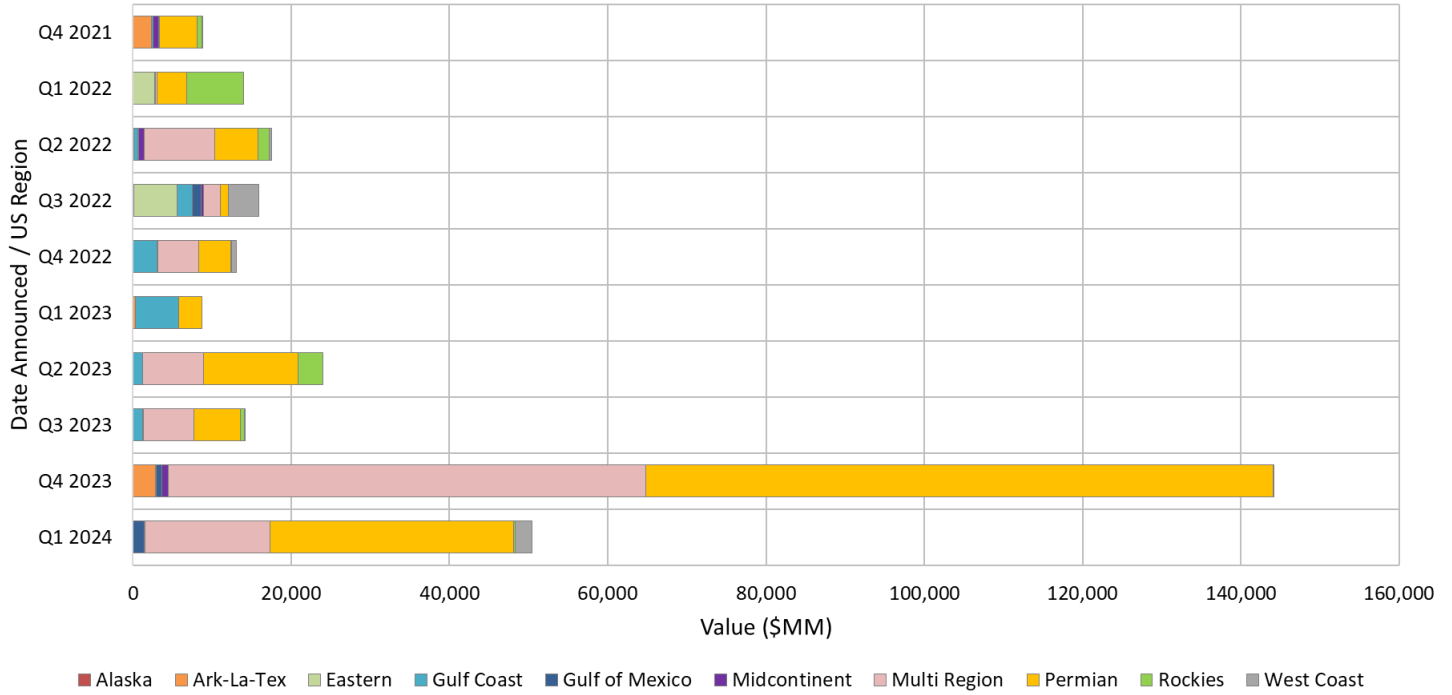


	Week Ending 03/22/2024			Week Ending 03/15/2024		Week Ending 03/24/2023
U.S. Rig Breakouts	Count	+/-	Count	+/-	Count	
Oil	509	(1)	510	(84)	593	
Gas	112	(4)	116	(50)	162	
Not Specified	3	0	3	0	3	
Directional	56	2	54	6	50	
Horizontal	556	(6)	562	(136)	692	
Vertical	12	(1)	13	(4)	16	
Land (Inc Others)	601	(4)	605	(138)	739	
Inland Waters	0	0	0	(1)	1	
Offshore	23	(1)	24	5	18	
US Total	624	(5)	629	(134)	758	

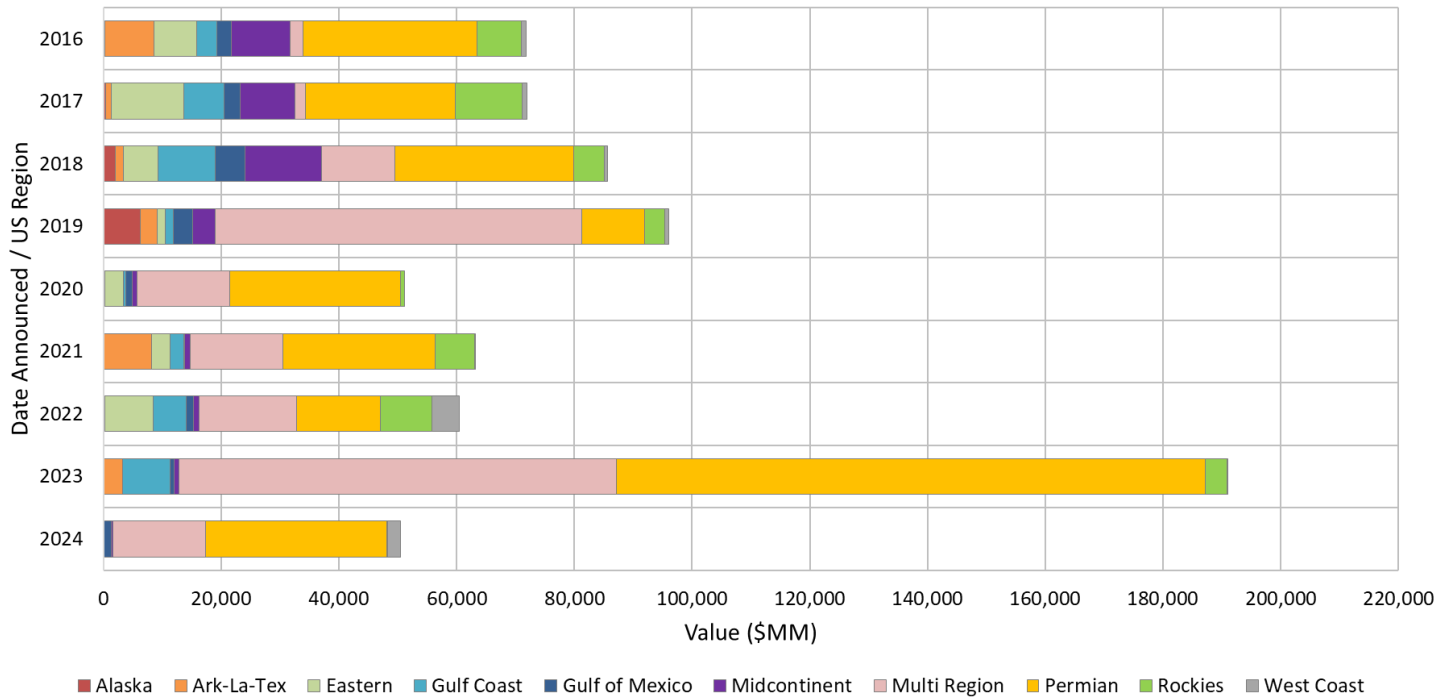
*Source—Baker Hughes Weekly Rig Counts



DEAL VALUE BY US REGION (BY QUARTER)



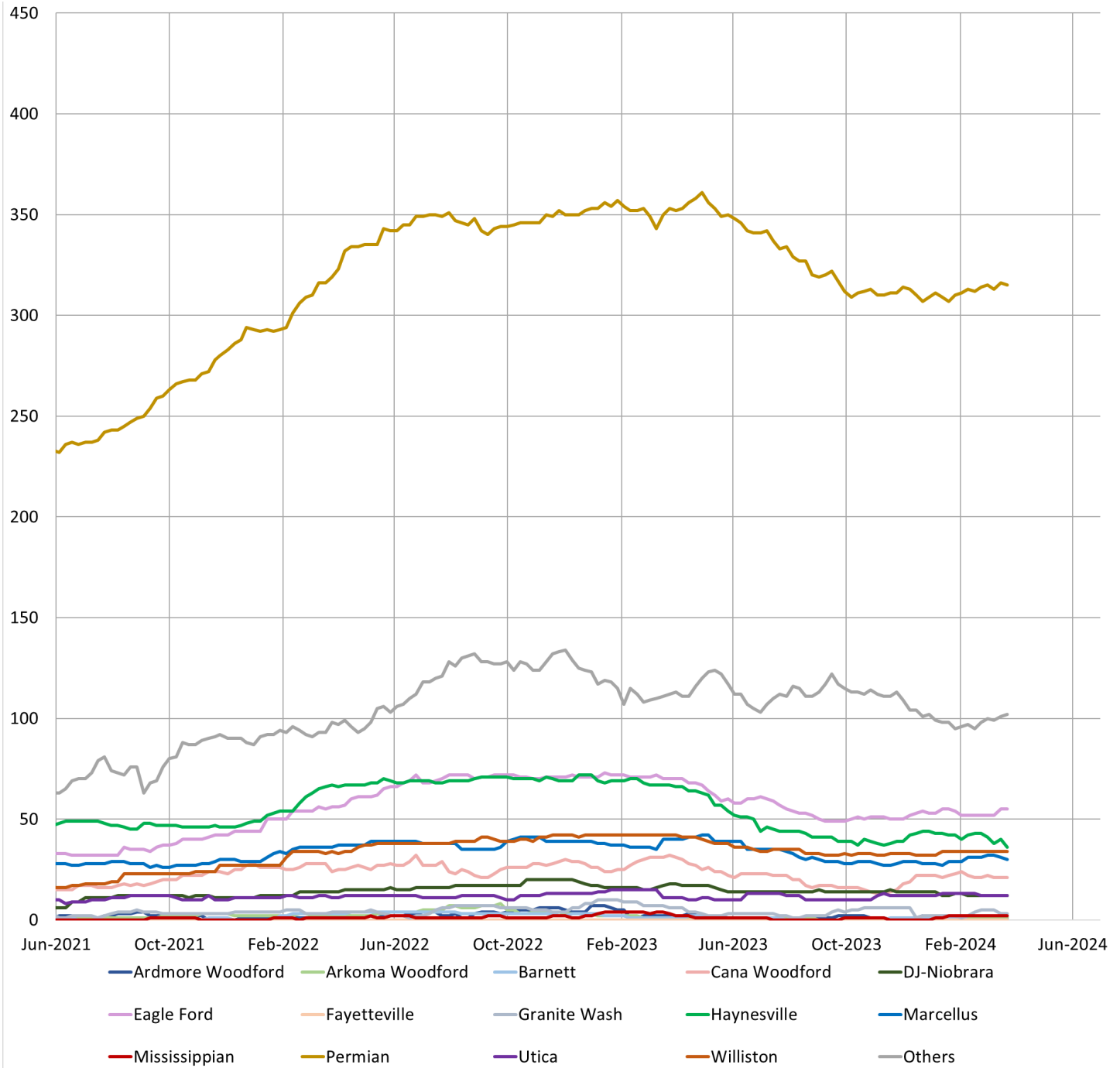
DEAL VALUE BY US REGION (BY YEAR)



*Source—PLS M&A Database (Charts exclude terminated deals)



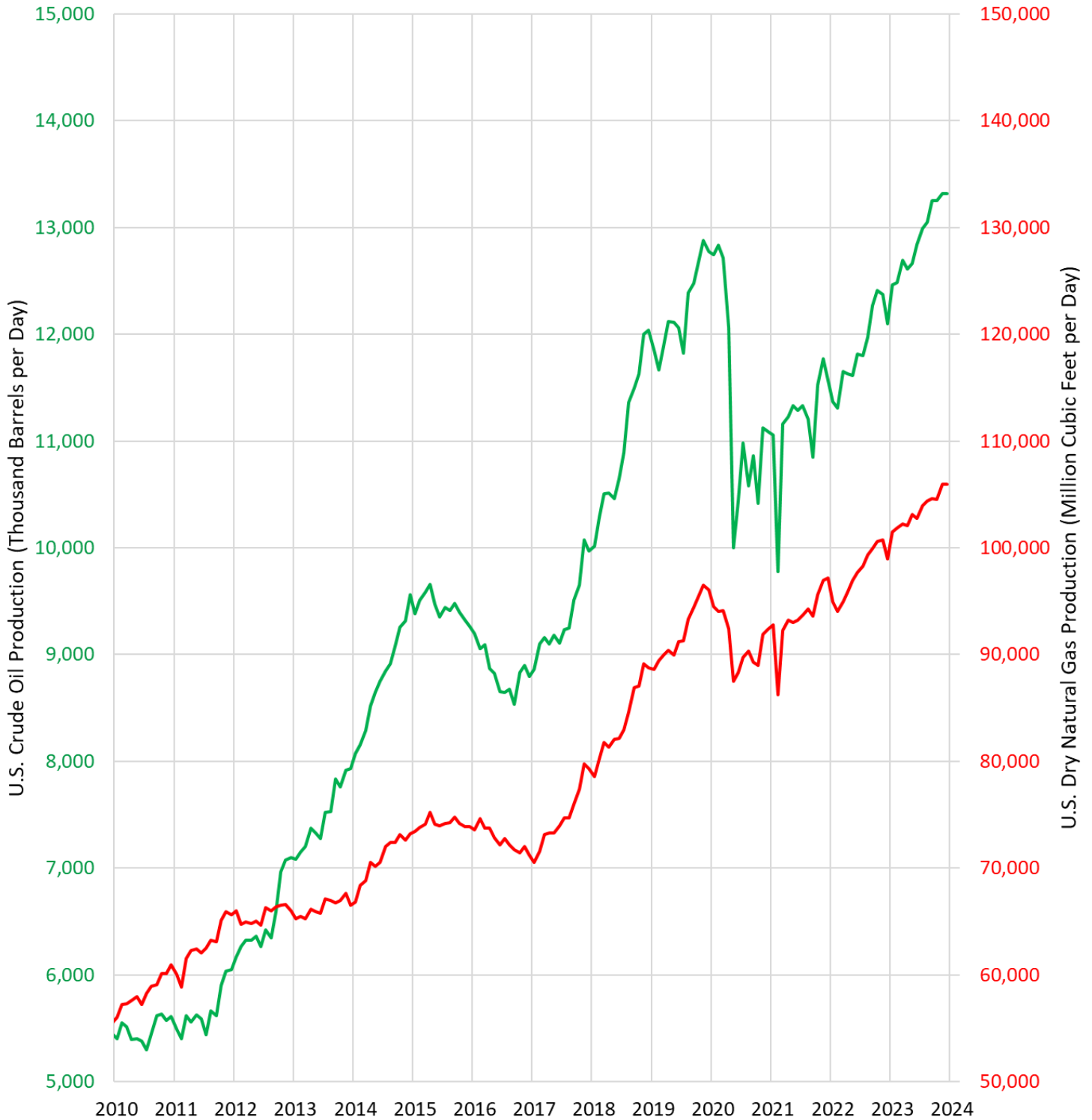
RIG ACTIVITY BY US REGION



*Source—Baker Hughes Weekly Rig Counts



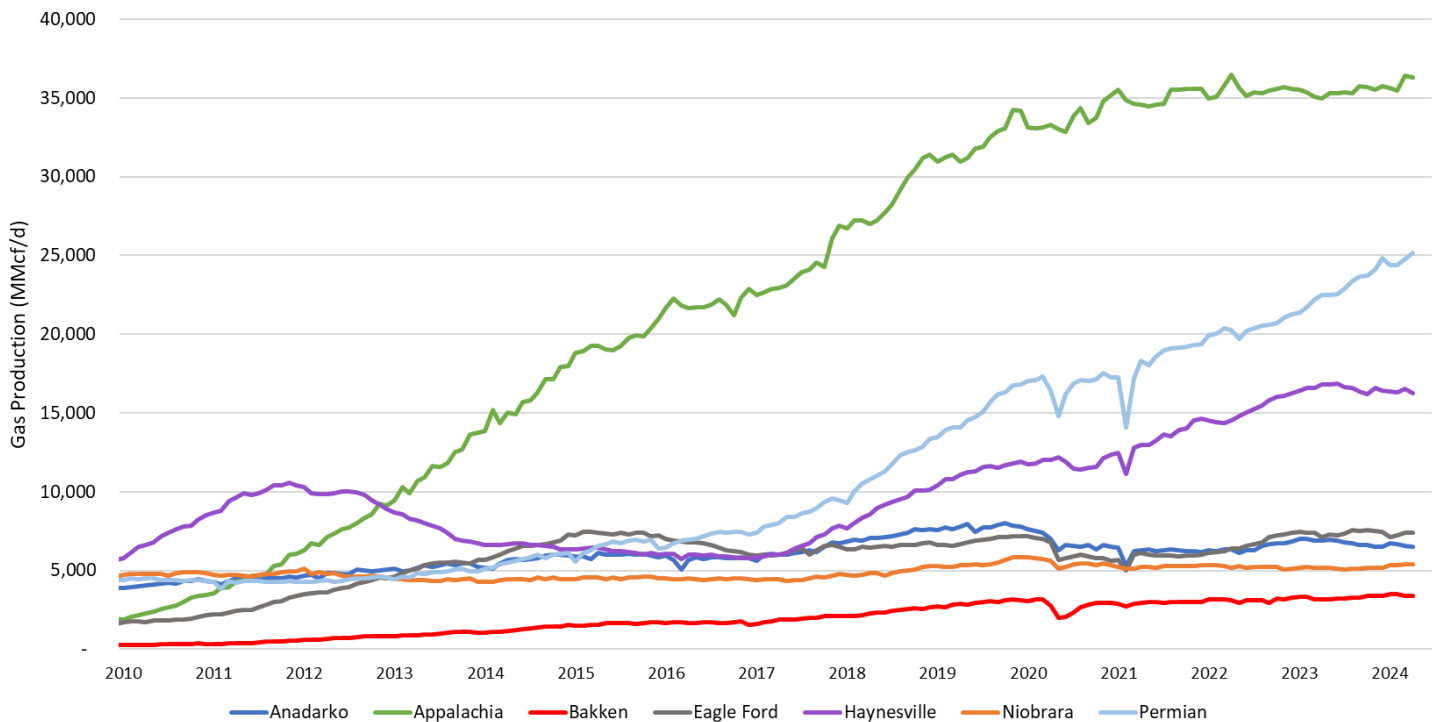
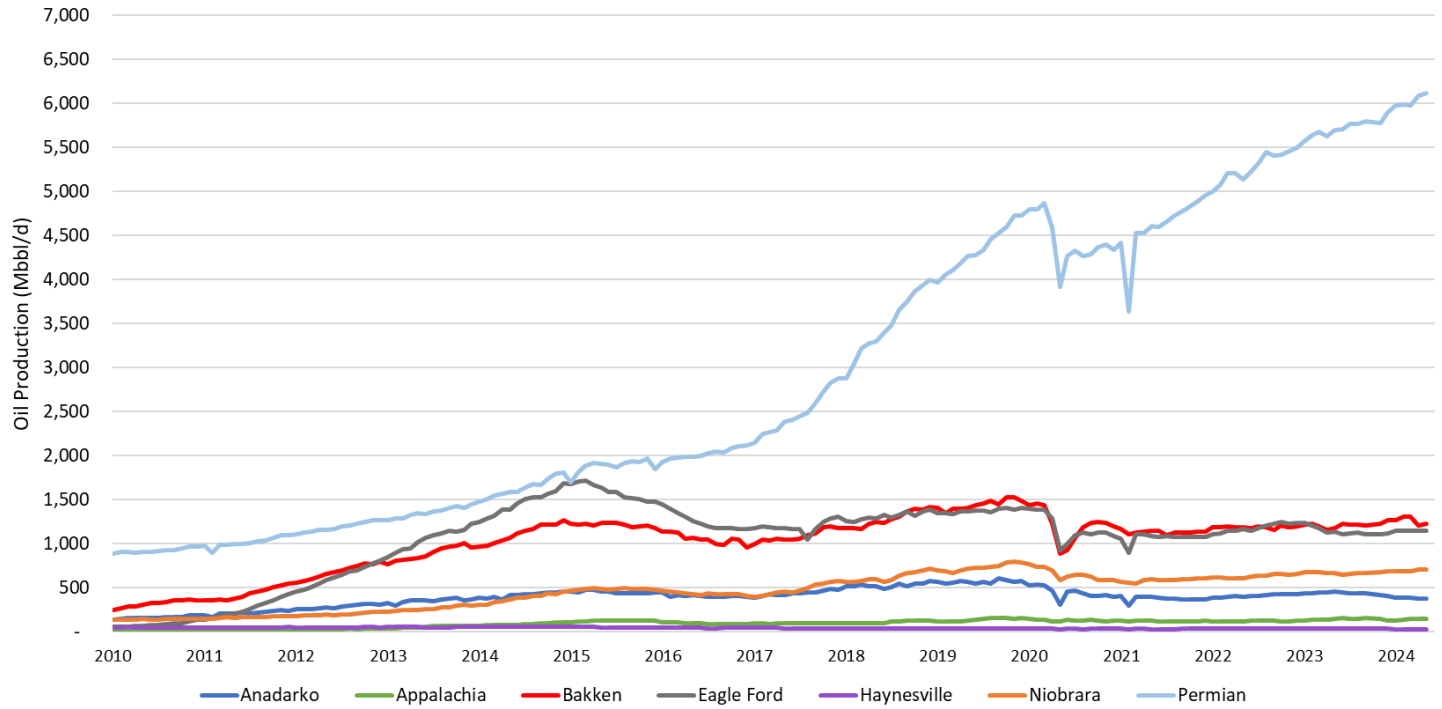
US DAILY CRUDE (MMbbl) & DRY NATURAL GAS PRODUCTION (MMcf)



*Source—Energy Information Administration, United States (EIA)



HISTORICAL PRODUCTION OF SELECTED US SHALE REGIONS



*Source—Energy Information Administration, United States (EIA)



UPCOMING EVENTS

March 2024

[ROCC US Men's Clay Court Championship](#)

March 30 - April 7

Houston, TX

April 2024

[World Oilman's Poker Tournament \(WOPT\)](#)

April 3-5

Las Vegas, NV

[The Leukemia & Lymphoma Society \(LLS\) Big Climb](#)

April 6

Houston, TX

[HBA & HPF Spring Social](#)

April 11

Houston, TX

[World Oilman's Mineral & Royalty Conference \(MARC\)](#)

April 15-16

Houston, TX

[Quorum Qnections Conference](#)

April 23-25

Las Vegas, NV

[HPF/SPE Fifth Annual Crawfish Boil](#)

April 24

Houston, TX

[World Oilman's Tennis Tournament \(WOTT\)](#)

April 24-28

Houston, TX

[ADAM Energy Golf Tournament](#)

April 29

Frisco, TX

May 2024

[Alteryx Inspire 24](#)

May 13-16

Las Vegas, NV

[North American Petroleum Accounting Conference](#)

May 16-17

Dallas, TX

[ASA Energy Valuation Conference](#)

May 16

Houston, TX

[Qnections 24 | Barcelona](#)

May 28-30

Barcelona, Spain

[Texas Dreamin' 2024](#)

May 30-31

Austin, TX

*Denotes an Opportune Sponsored Event



ABOUT RALPH E. DAVIS ASSOCIATES

Ralph E. Davis Associates LLC (RED) is an industry-leading petroleum engineering and geosciences firm committed to satisfying the individual needs of clients. We accomplish this by holding ourselves to the highest standards of integrity and professionalism to deliver honest, direct and actionable insights to help clients achieve their strategic objectives. We distinguish ourselves by combining reservoir engineering, geoscience evaluation techniques and advanced data analytics with economic analyses to provide our clients with individual, customized solutions.

Banks, bondholders, private equity firms, financial institutions and law firms around the world trust in RED's diverse services and unrivaled upstream oil and gas expertise to deliver comprehensive solutions that help clients make informed decisions. We add value to every engagement by employing a team approach, leveraging Opportune LLP's experienced bench of experts in transactional due diligence, tax advisory, investment banking, restructuring and valuation.

We offer technical and economic analyses to deliver our clients a complete, independent, accurate and detailed assessment of the value of their assets. We apply a robust set of technical capabilities to assist our clients. Our capabilities include:

- Reservoir engineering and geosciences
- Economic forecasting and reporting
- Data analytics and geospatial analysis

KEY CONTACTS



Steve Hendrickson is the President of Ralph E. Davis Associates, an Opportune LLP company. Steve has over 35 years of professional leadership experience in the energy industry with a proven track record of adding value through acquisitions, development and operations. Steve is a licensed professional engineer in the state of Texas, and holds an M.S. in Finance from the University of Houston and a B.S. in Chemical Engineering from The University of Texas at Austin. He recently served as a board member of the Society of Petroleum Evaluation Engineers (SPEE) and is a registered FINRA representative.



John Beaird is Vice President of Ralph E. Davis Associates, an Opportune LLP company. John has 39 years of oil and gas management, reservoir engineering, and petroleum economics evaluation experience. Recent relevant experience includes the Permian, Western Gulf, Tx-La-Miss Salt, Mid-Continent, Denver-Julesburg, Wind River, Williston Basin, and Appalachian Basins. John is a registered Petroleum Engineer in the State of Texas and holds a B.S. in Petroleum Engineering from Louisiana Tech University. He is also an active member of the Society of Petroleum Evaluation Engineers (SPEE).



David Edwards is a Petroleum Engineer at Ralph E. Davis Associates, an Opportune LLP company. David has over three years of reserves engineering experience in conventional and unconventional reservoirs. Before RED, David was a Petroleum Engineer at a lower middle market A&D advisory firm where he handled the technical processes for marketed assets. He began his career with an operator in Dallas, where he contributed to its engineering, operations, and A&D teams. David holds an M.B.A. from The University of Texas Permian Basin and a B.S. in Petroleum Engineering from The University of Oklahoma.

