



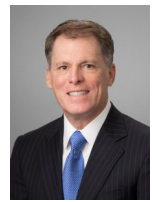
Weekly E&P Update

October 10, 2023

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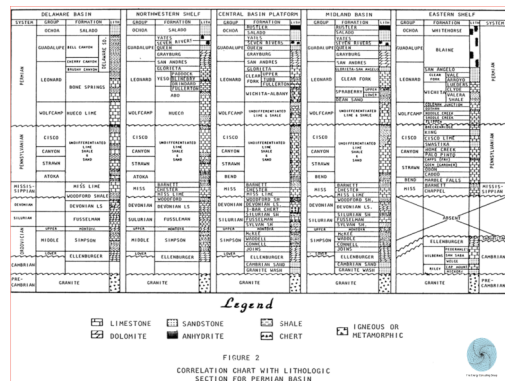
Permian Barnett Development Continues

By Steve Hendrickson
President of Ralph E. Davis Associates



An article we highlight in our Industry Headlines this week is from the Society of Petroleum Engineers [Journal of Petroleum Technology](#), which summarizes the key takeaways from the recent SPE Permian Basin Energy Conference. One of the topics discussed was Permian operators' search for new plays in the basin to replenish the remaining undrilled inventory. The Barnett Shale was discussed as one of the plays in the Permian that holds promise, so in this week's newsletter, we thought a quick summary of the play would be informative.

The Barnett Shale is a Mississippian-aged formation that is present over much, but not all of the greater Permian Basin. In many correlations we've seen, it is referred to as the Woodford Shale, which is a convenient way to aggregate the section from the upper Devonian through the Mississippian. It has been developed in a relatively small number of wells (compared to other plays in the Permian), and quickly identifying the wells completed in the zone is challenging due to inconsistencies in naming.



(Source: Energy Consulting Group)

I examined 63 horizontal wells that were identified as producing from the Barnett formation in Enverus and made the following observations -

The earliest wells in the play were placed on production in 2006, but drilling activity really didn't start until 2018. Last year, there were 22 wells placed on production, and the pace so far this year has been similar. A small group of wells in this data set were drilled in the Delaware Basin, but the majority were drilled on the Central Basin Platform (CBP) in and around southern Andrews County. A smaller group is on the western edge of the Midland Basin, and a few are scattered over the southern CBP around Crane County. Elevation Resources is the clear leader in activity to date, but Occidental and others are also exploring the play.

The Delaware Basin wells produce gas, but those on the CBP and into the Midland Basin are oil wells. Cumulative

GORs range from around 1000 up to 5000 scf/bbl, but this range reflects different levels of depletion as the GOR rises over time. As a result, the wells that have been in production for less time exhibit lower GOR's.

Focusing strictly on the oil wells, most of them are nominally 2-mile laterals. Well spacing is relatively open so far: we estimate that most are spaced at two to four wells per section, and almost all would be classified as "parent" wells using our definition of a child as being within 1000' of a well that was completed more than 12 months earlier.

Because many of the wells are relatively young, decline curve analysis is risky. Nevertheless, we took a shot at estimating the ultimate oil recovery for the 32 oil wells in our data set with at least one year of production history. We derived a mean EUR of 50 bbl/foot with a distribution P10/P90 ratio of 2.6. Remember that this is a small data set and is impacted by the potential oil production allocation issues common to Texas oil leases.

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](#)

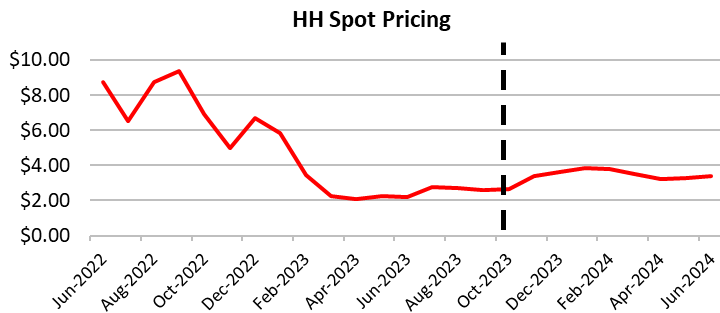
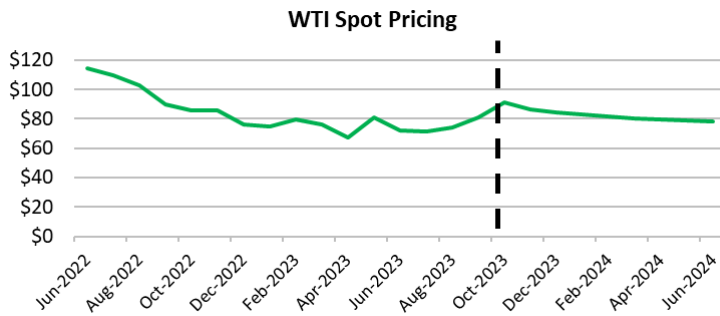
[Historical Production of US Shale Regions](#)

[Upcoming Events](#)

[About Us/Key Contacts](#)



NYMEX FUTURE PRICING



MONDAY'S MARKET CLOSE

NYMEX WTI CRUDE OIL FUTURES as of October 9, 2023 Close (\$/bbl)

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$85.49	(\$2.51)	\$88.00	\$83.56
2024	\$78.32	(\$2.49)	\$80.81	\$75.20
2025	\$72.56	(\$2.45)	\$75.01	\$69.84
2026	\$68.74	(\$2.55)	\$71.29	\$66.08
2027	\$65.76	(\$2.66)	\$68.42	\$63.22

NYMEX HH NATURAL GAS FUTURES as of October 9, 2023 Close (\$/MMBtu)

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$3.50	\$0.46	\$3.04	\$5.53
2024	\$3.59	\$0.25	\$3.34	\$4.70
2025	\$4.04	\$0.11	\$3.93	\$4.51
2026	\$4.04	\$0.02	\$4.02	\$4.46
2027	\$3.95	(\$0.01)	\$3.96	\$4.34

INDUSTRY METRICS—QUICK SNAPSHOT

	Current	Last Week	WoW Change	%Change
Crude Oil Near-Month Price (\$/bbl)	\$86.43	\$90.82	(\$4.39)	(5%)
Natural Gas Near-Month Price (\$/MMBtu)	\$3.37	\$2.96	\$0.41	14%
Weekly Upstream-Deal Transaction Value (\$MM)	\$2,113.63	\$61.00	\$2,052.63	3,365%
Weekly Number of Upstream-Deal Transactions	2	1	1	100%
Current Total US Rig Count	619	623	(4)	(0.6%)
US Field Crude Oil Production (MMbbl/day)	12.9	12.9	0	-
US Field Dry Natural Gas Production (Bcf/day)	106.0	106.1	(0.1)	(0.1%)
Commercial Crude Oil Stocks-Excluding SPR (MMbbl)	414	416	(2)	(0.5%)
Natural Gas Stocks-Working Gas Underground Storage (Bcf)	3,445	3,359	86	3%
Total Drilled But Uncompleted Wells (DUC-Last Month)	4,749	4,749	0	-

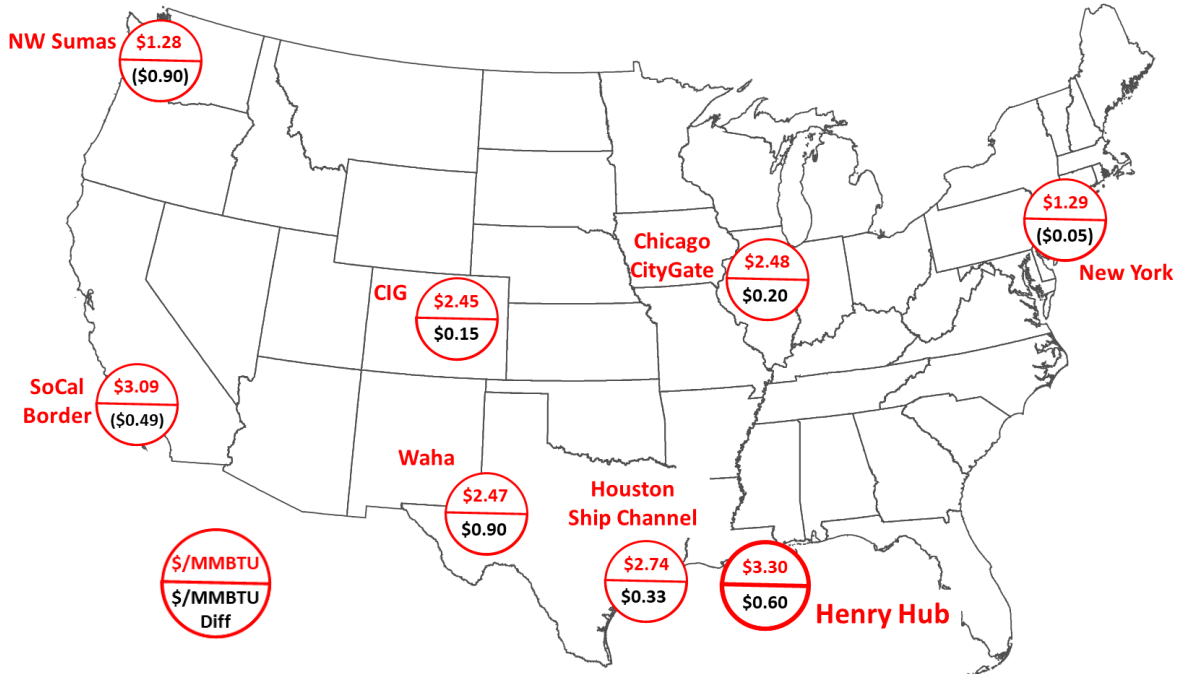
*Source—Energy Information Administration, United States (EIA)

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

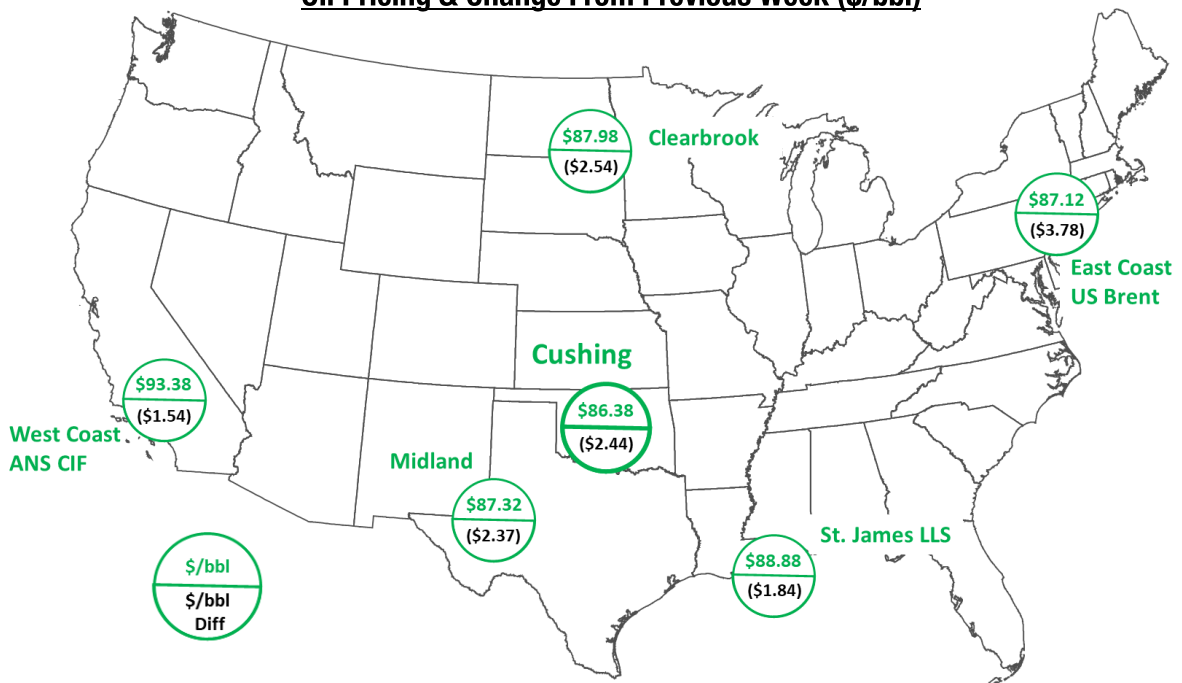


US COMMODITY PRICES CONTINUED

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



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



*Source—Bloomberg LP



SELECTED INDUSTRY HEADLINES

US Drillers Cut Oil, Gas Rigs for Third Week In a Row

U.S. energy firms recently cut the number of oil and natural gas rigs operating for a third week in a row for the first time since early September, energy services firm Baker Hughes said in its closely followed report on Oct. 6.

OPEC Raises Oil Demand View in Long-term Outlook

OPEC raised its world oil demand forecasts for the medium and long term in an annual outlook, and said \$14 trillion of investment is needed to meet this demand even as renewable fuel use grows and more electric cars take to the road.

Oil Producers in Midland Are Working on the Next Permian

When the title of the keynote address at an oil conference in Midland is “The Secret To Finding the Next Permian,” it suggests there are people with doubts about the status quo.

Oil Prices Rise and Global Stocks Fall After Israel Declares War on Hamas

Oil prices surged while stock markets and the Israeli currency fell at the start of the week as investors reacted to war between Hamas and Israel.

Oil Prices Rise, But Post Biggest Weekly Decline Since March (LOGIN CREDENTIALS REQUIRED)

Oil prices rose recently but remained posted their steepest weekly losses since March, after another partial lifting of Russia's fuel export ban compounded demand fears due to macroeconomic headwinds.

Tighter Supply/Demand Outlook Seen as Natural Gas Futures Maintain Strength Early (LOGIN CREDENTIALS REQUIRED)

Natural gas futures held onto last week's huge gains in early trading recently as analysts highlighted a tightening fundamental outlook to close out the injection season.

US Natural Gas Exports Hit Record Levels, But Analysts Say More Investment is Needed to Meet Demand

While the trend is only going to continue with growth in the U.S. liquefied natural gas sector, more investment in upstream production is needed to meet the demand, analysts said.

Natural Gas Prices Forecast: News of Strikes, Cold Fronts Fuel Gains

Amid Middle East tensions and Australian strike plans, US natural gas futures hit a 10-month high, affecting global prices and forecasts.

Weekly Natural Gas Spot Prices, Futures Rally on Production Declines, Northern Chills

Weekly natural gas cash prices powered upward, supporting the futures market in the process, amid bouts of chilly air and production interruptions in the prolific Permian Basin.

BP's \$4.1 Billion Bet on Renewable Natural Gas Gets Underway

The oil giant is counting on a new modular design to rapidly scale up the production of renewable natural gas from landfills.

Carbon Sequestration Drives Surveys

The 45Q tax credit for carbon capture and storage has increased substantially since its introduction in 2008. Now at \$85 for every metric ton, it is helping drive a search for storage sites that are close to emission sources and have the right geology to contain carbon.

Shell Aims to 'Decarbonize Profitably,' Its New Energies US CEO Says

Shell's strategy has not changed as the company remains focused on delivering more value with less emissions, Shell New Energies US CEO Glenn Wright said recently, addressing unease about its position in the energy transition.



SELECTED RECENT TRANSACTIONS

Civitas Resources to Buy Permian Assets For About \$2.1 bln

Civitas Resources will buy acreage in the oil-rich Permian Basin from global energy trader Vitol's U.S. upstream venture for about \$2.1 billion in cash and stock, the U.S. oil and gas producer said recently.

1979 Royalties, LP Announces Northern Midland Basin Minerals & Royalty Acquisition From Peacemaker Royalties

1979 Royalties, LP a subsidiary of Endeavor Energy Resources, announced it has closed the acquisition of oil & gas mineral and royalty interests from Peacemaker Royalties, a portfolio company of EnCap Investments, in the Midland Basin for \$61 million in cash.

W&T Offshore Acquires Eight Oil, Gas Producing Assets in Gulf of Mexico

W&T Offshore, Inc. has completed the acquisition of working interests in eight shallow water oil and gas producing assets in the central and eastern shelf region of the Gulf of Mexico from an undisclosed private seller.

Santos to Divest Half of Working Interest in 148 Leases at Alaska North Slope

Australian oil and gas major Santos said recently it would divest half of its working interest in 148 exploration leases in the Langiappe area on the Alaska North Slope in a farm-down agreement with two U.S.-based companies.

Momentum Minerals Operating II, LP Closes Permian Basin Mineral and Royalty Acquisition

Momentum Minerals has closed the acquisition of a Permian Basin mineral and royalty package from Post Oak Crown Minerals, LLC and Post Oak Legacy Assets I, LLC, both of which are affiliates of Post Oak Energy Capital, LP

Vital Energy acquires Permian Basin Assets from Henry, Maple and Tall City

Vital Energy has signed agreements valued at about \$1.17 billion to expand its acreage in the Permian Basin, where dealmaking is gathering pace as drillers tap the largest U.S. oil patch to quickly replenish their depleting reserves.

Magnolia Oil & Gas Announces Bolt-On Asset Acquisition in Giddings

Magnolia Oil & Gas Corporation announced recently that the Company has entered into a definitive purchase agreement to acquire certain oil and gas producing properties including leasehold and mineral interests in Giddings for \$300 million, subject to customary purchase price adjustments.

Viper Energy Partners LP, A Subsidiary Of Diamondback Energy, Inc., Announces Acquisition

Viper Energy Partners LP, recently announced it has entered into a definitive purchase and sale agreement to acquire certain mineral and royalty interests from affiliates of Warwick Capital Partners and GRP Energy Capital in exchange for approximately 9.02 million Viper common units and \$750 million of cash, subject to customary adjustments.

Phoenix Capital Group Purchases Assets in North Dakota

Phoenix Capital Group, a leading oil and gas mineral rights acquisition company, has announced the purchase of roughly 2,530 net acres of land in Mountrail County, North Dakota valued at roughly \$9 million.

Crescent Energy to Acquire Additional Interests in its Operated Western Eagle Ford Position

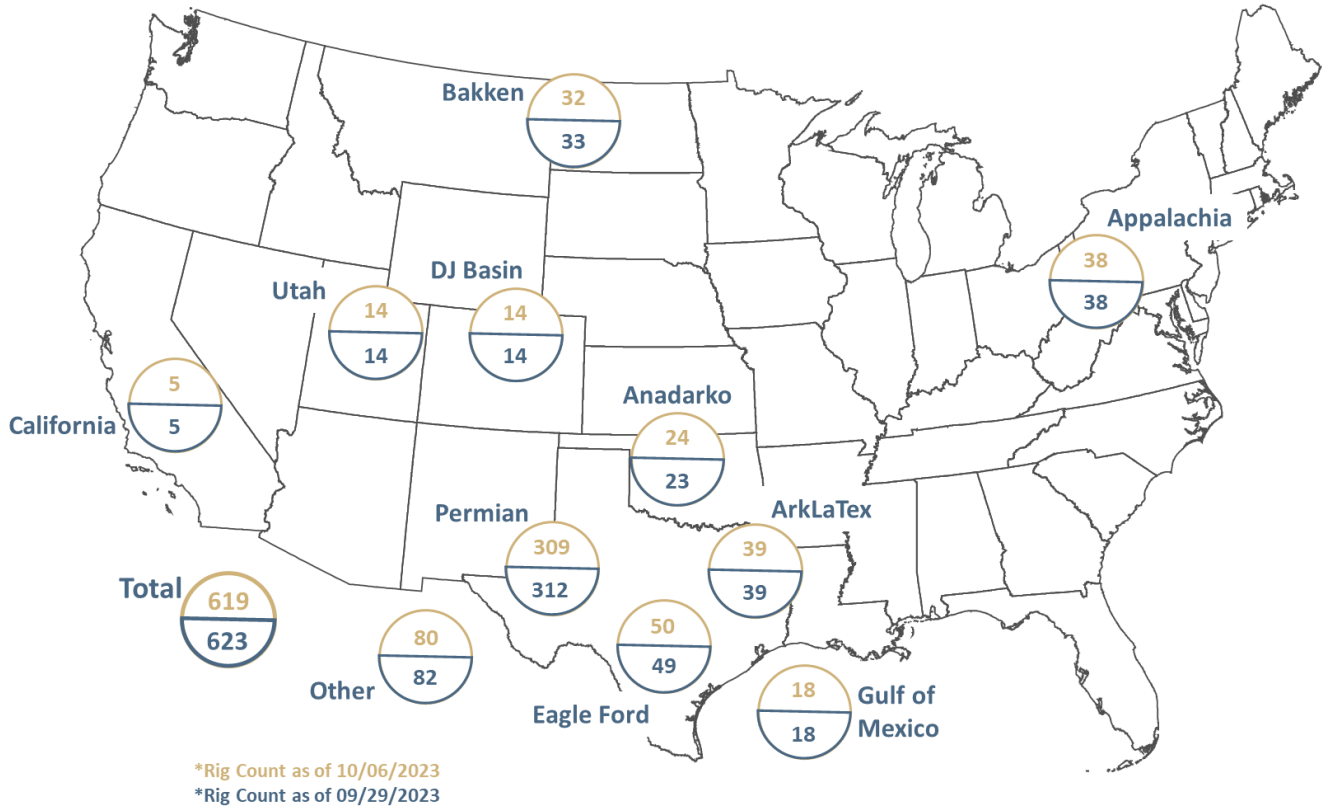
Crescent Energy Company recently announced that it has entered into a definitive purchase agreement to acquire incremental working interest in its operated Western Eagle Ford assets for total consideration of \$250 million in cash, subject to customary purchase price adjustments.

Dorchester Minerals, L.P. Completes Acquisition of Mineral and Royalty Interests

Dorchester Minerals, L.P. announced that it has completed an acquisition of mineral and royalty interests totaling approximately 3,355 gross acres and 568 net royalty acres located in three counties in Texas.



RIG ACTIVITY BY US REGION

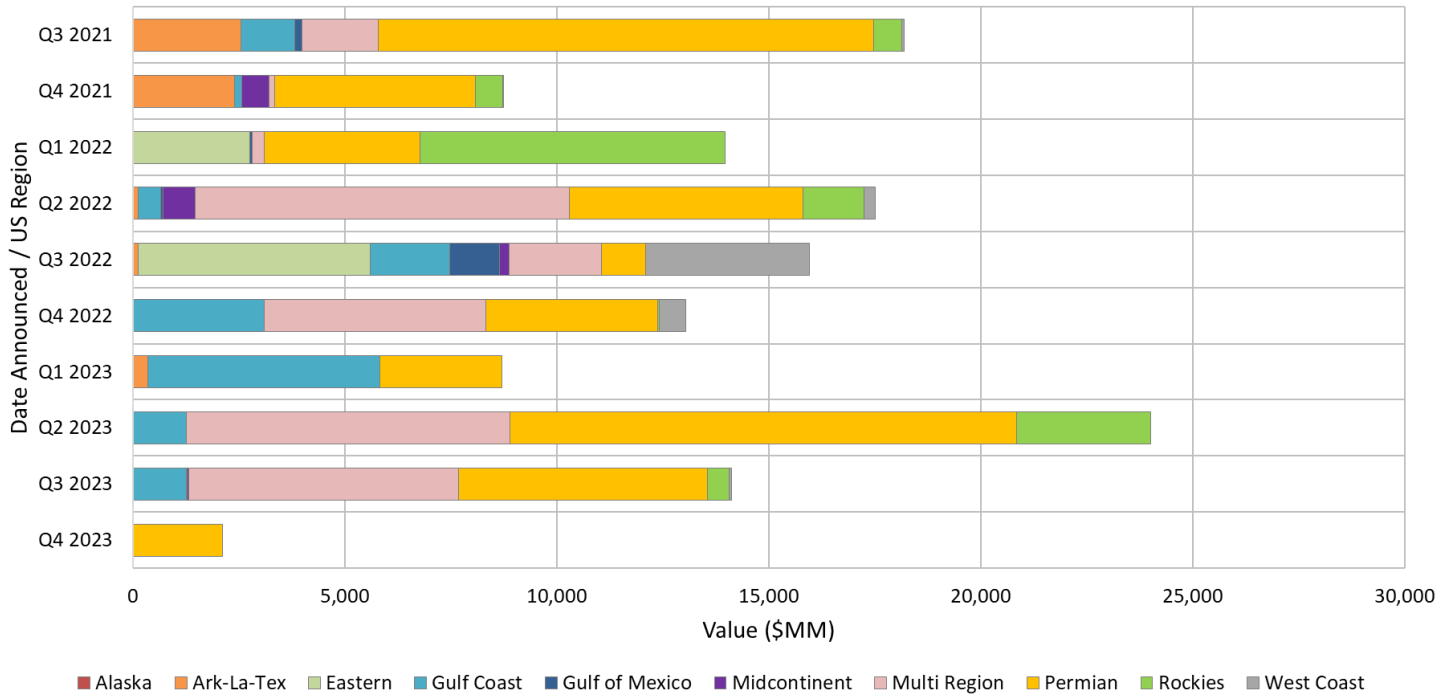


	Week Ending 10/06/2023			Week Ending 09/29/2023			Week Ending 10/07/2022		
U.S. Rig Breakouts	Count	+/-	Count	+/-	Count	+/-	Count	+/-	
Oil	497	(5)	502	(105)	602				
Gas	118	2	116	(40)	158				
Not Specified	4	(1)	5	2	2				
Directional	53	(2)	55	12	41				
Horizontal	553	0	553	(145)	698				
Vertical	13	(2)	15	(10)	23				
Land (Inc Others)	596	(4)	600	(150)	746				
Inland Waters	3	0	3	0	3				
Offshore	20	0	20	7	13				
US Total	619	(4)	623	(143)	762				

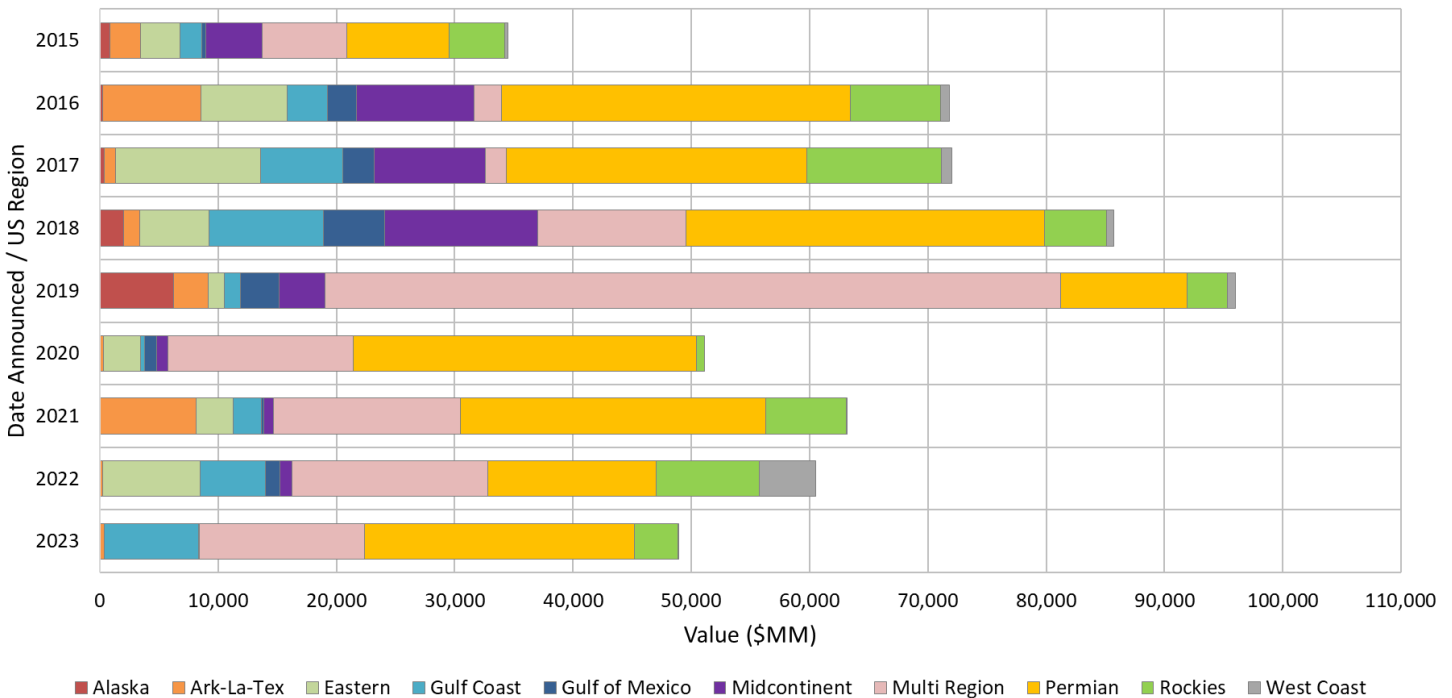
*Source—Baker Hughes Weekly Rig Counts



DEAL VALUE BY US REGION (BY QUARTER)



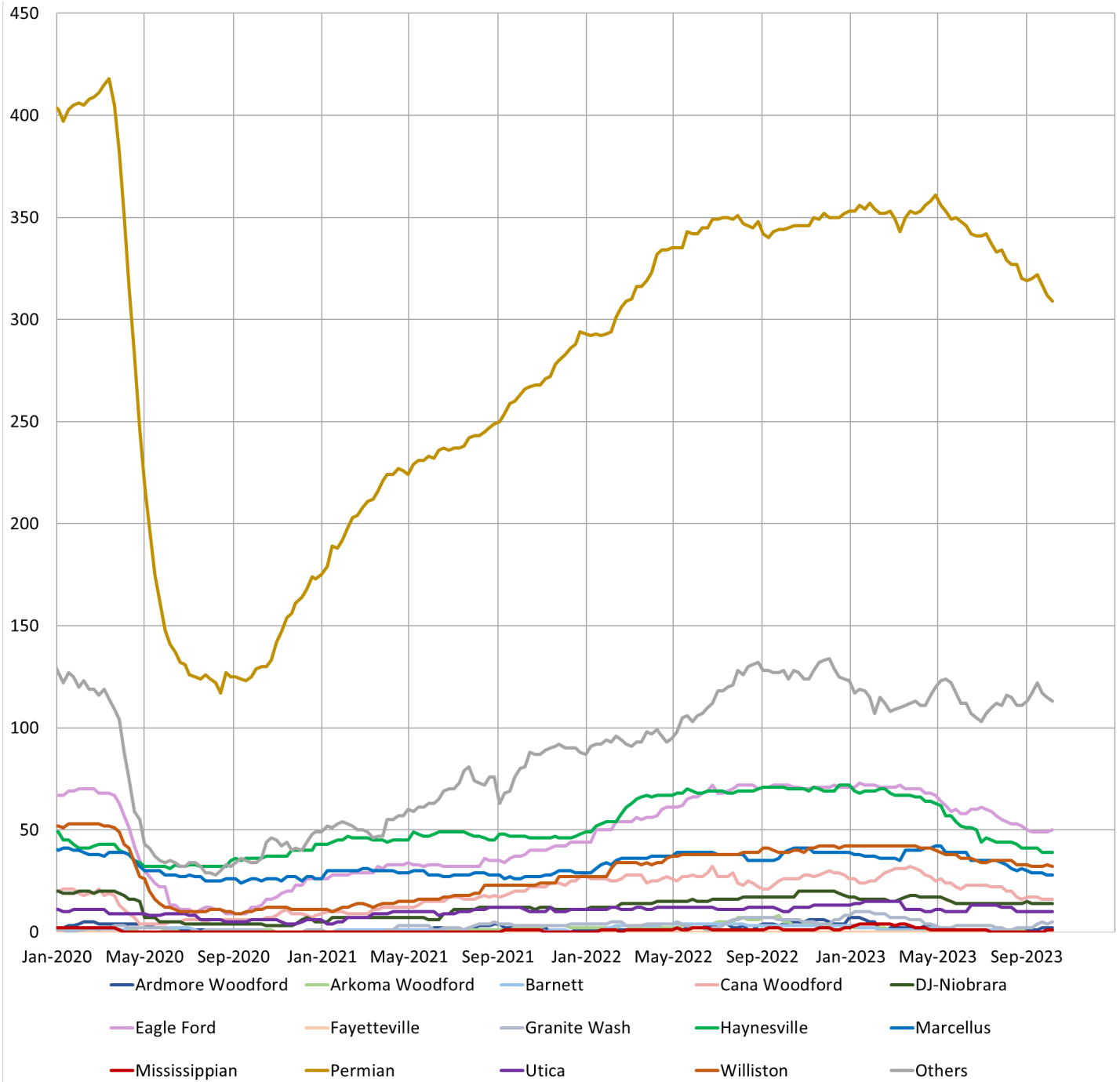
DEAL VALUE BY US REGION (BY YEAR)



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



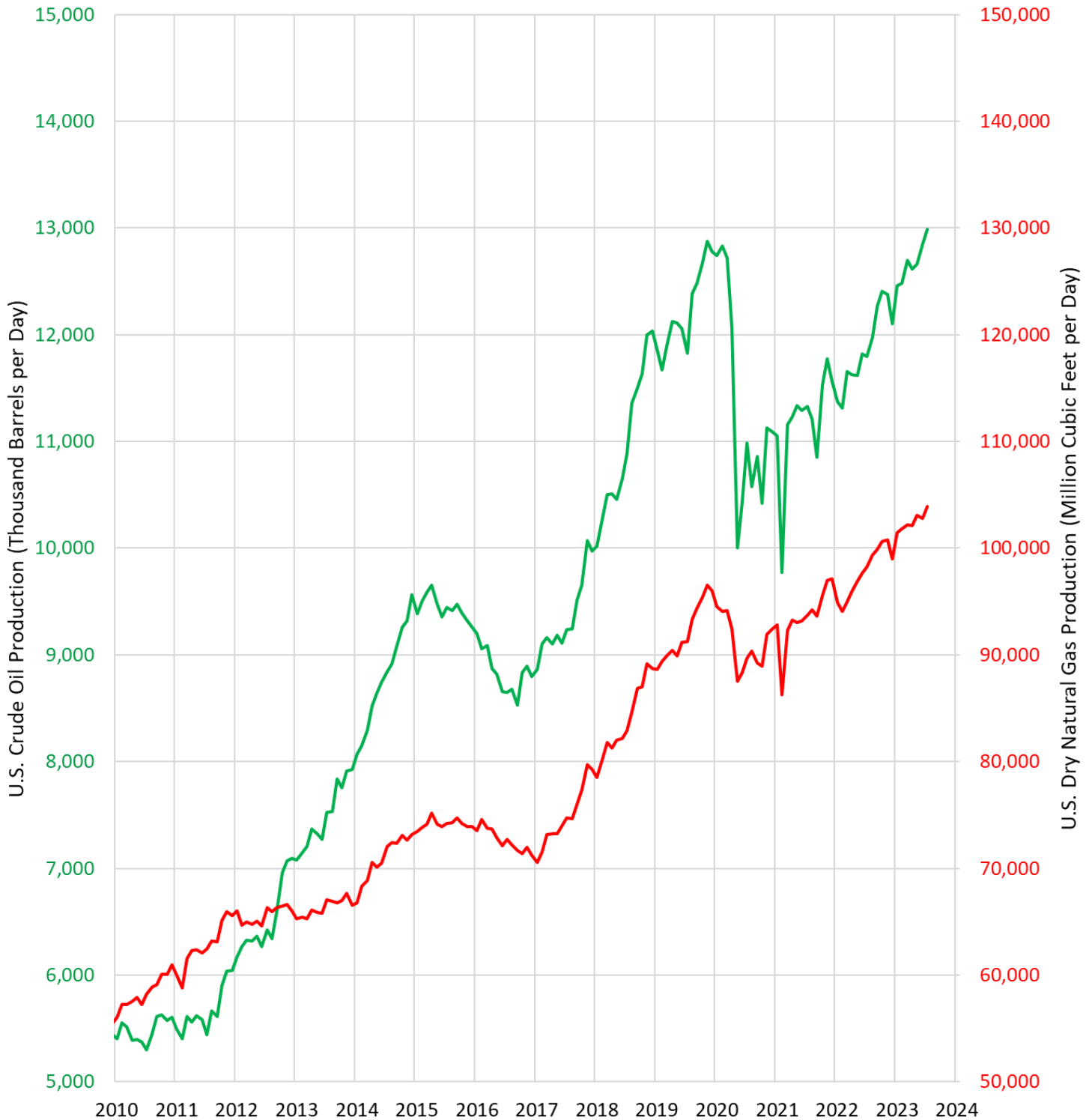
RIG ACTIVITY BY US REGION



*Source—Baker Hughes Weekly Rig Counts



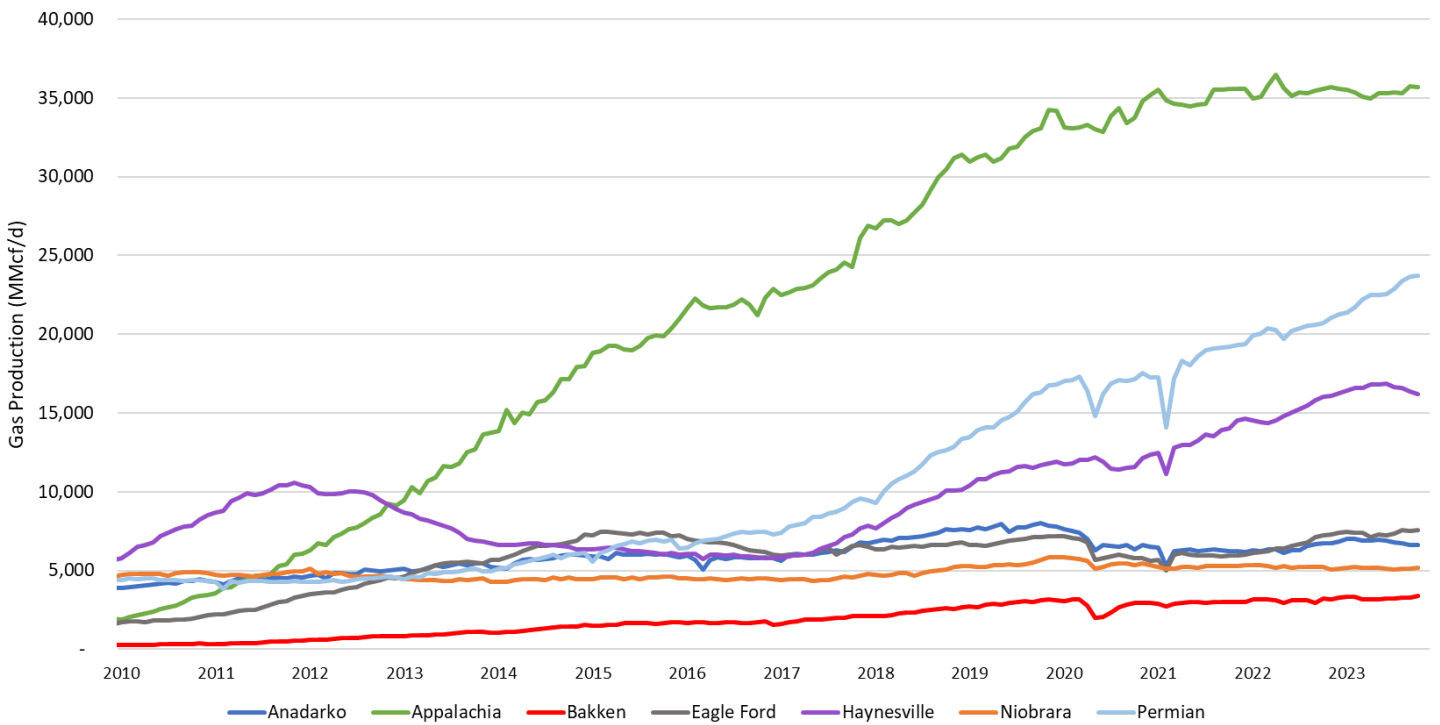
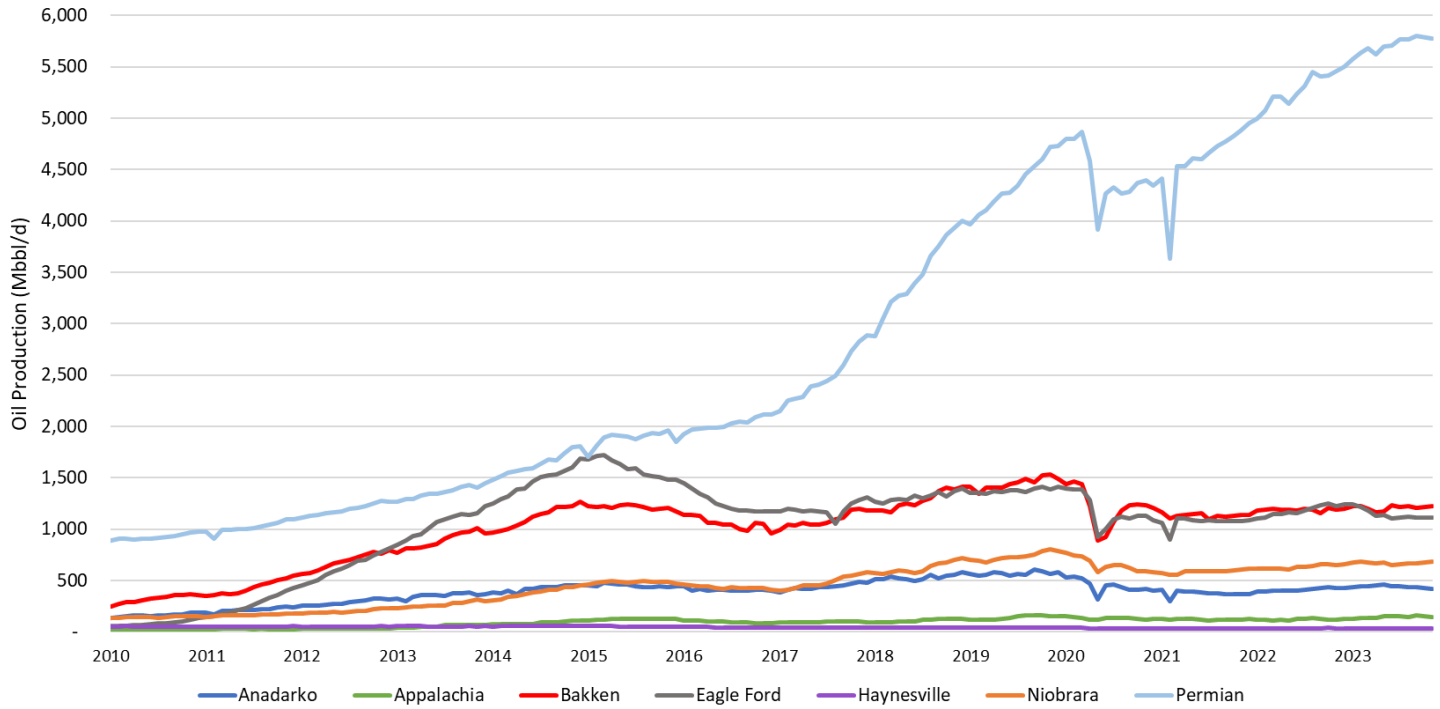
US DAILY CRUDE (MMbbl) & DRY NATURAL GAS PRODUCTION (MMcf)



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



HISTORICAL PRODUCTION OF SELECTED US SHALE REGIONS



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



UPCOMING EVENTS

October 2023

<u>2023 National Conference of Bankruptcy Judges (NCBJ)</u>	October 11-14	Austin, TX
<u>Tulsa Octoberfest</u>	October 19-22	Tulsa, OK
<u>Small Steps Golf Classic</u>	October 30	Houston, TX
<u>Digital Wildcatters—FUZE</u>	October 30-31	Houston, TX

November 2023

<u>IPAA Annual Meeting</u>	November 6-8	San Antonio, TX
<u>AICPA Oil & Gas Conference</u>	November 8-10	Las Vegas, NV
<u>Accounting and Financial Reporting Conference</u>	November 16	Tulsa, OK
<u>OSU Oil and Gas Accounting Conference</u>	November 17	Tulsa, OK
<u>Boys & Girls Club 8th Annual Sporting Clays Tournament</u>	November 17	Houston, TX
<u>IPAA Texas Hold'Em Tournament</u>	November 30	Houston, 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).



Yvonne Trujillo is a Senior Petroleum Engineer at Ralph E. Davis Associates, an Opportune LLP company. Yvonne has over 25 years experience in the oil and gas industry with extensive expertise in reserves engineering, SEC and PRMS/SPE reporting and economics and asset evaluation in conventional and unconventional reservoirs in the U.S. Lower 48. Yvonne earned a B.S. in Mechanical Engineering at Simon Bolivar University in Caracas, Venezuela and an M.S. in Petroleum Engineering at the University of Houston.



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.

