



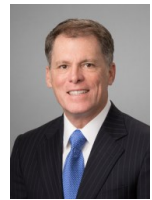
Weekly E&P Update

January 17, 2023

Vol. 2

ChatGPT Continues to Impress

By Steve Hendrickson
President of Ralph E. Davis Associates



In one of our newsletters late last year, I quickly looked at the [ChatGPT](#) "research release" launched by [OpenAI](#). If you haven't heard of it yet, you surely will, because it has great potential to enhance, disrupt or eliminate certain occupations that rely on the use of words. According to Insider, the Wall Street Journal reports that since ChatGPT was released, [the value of OpenAI](#) has been estimated at \$29 billion. Its adoption has [significant consequences](#) for Google's search engine business, and it [reached one million users](#) in only five days.

In my previous article, I concluded that it was unlikely it would have a significant impact on the practice of petroleum engineering, but I've spent more time with it and now see at least two realms where it could impact the productivity of engineers.

Time taken to reach 1m users (mths)

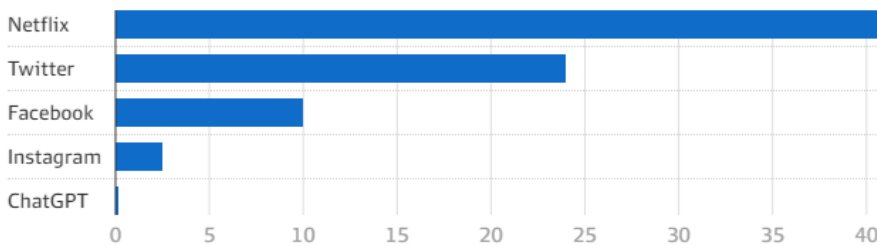


Chart: Financial Review • Source: Genevieve Roch-Decter, CFA

[CLICK TO ENLARGE](#)
(Source: Financial Review)

Writing - The platform was specifically designed to write, and it's quite good at it, at least to a certain level of insight and nuance. A [recent article](#) describes how universities are beginning to change the way they teach to take into account its ability to write essays. One professor was quoted as saying that the clearly-best paper submitted by a particular class was a ChatGPT product. After college, technical professionals often do a good bit of writing, and this could be a tool that improves their productivity.

Coding - This is an area that I've been really impressed with. Many engineers don't write their own code to solve engineering problems. They either purchase third-party software or try to make do with products like Excel, Access, and Spotfire. Hiring developers to write software can be expensive, and there are often challenges in bridging the gap between the subject matter expert and the developer. I've been impressed so far with the ability of ChatGPT to write short pieces of code in R, and I'm curious to see it in action with Python. The simple questions I asked it solved quickly, and probably with fewer lines than I would have used. It's able to work conversationally, so if you can describe your problem in discrete steps, you can develop a customized solution in a very short time with limited prior experience.

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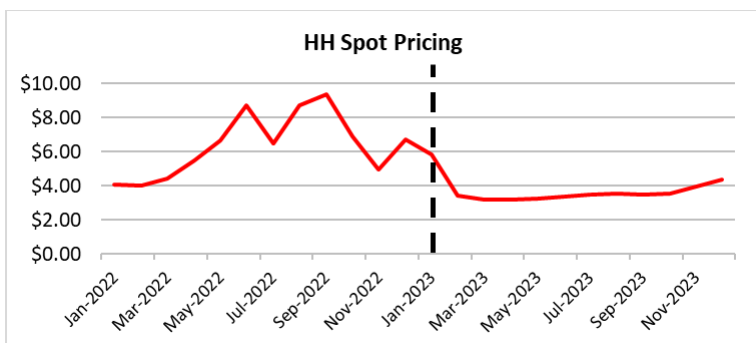
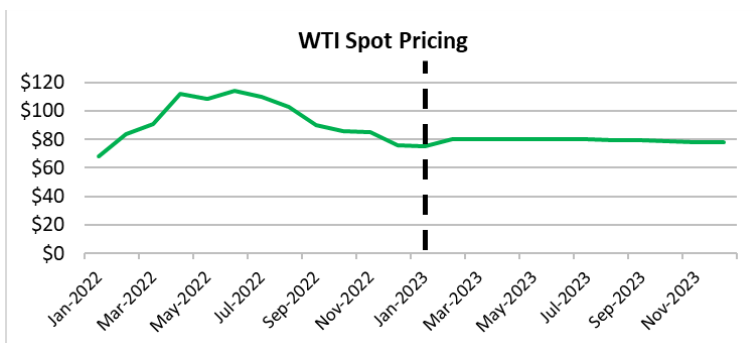
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NYMEX FUTURE PRICING



FRIDAY'S MARKET CLOSE

NYMEX WTI CRUDE OIL FUTURES as of January 13, 2023 Close (\$/bbl)

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$79.52	\$4.53	\$74.99	\$71.04
2024	\$75.02	\$2.83	\$72.19	\$66.09
2025	\$70.79	\$1.81	\$68.98	\$62.87
2026	\$67.36	\$1.07	\$66.29	\$60.75
2027	\$64.48	\$0.58	\$63.90	\$59.58

NYMEX HH NATURAL GAS FUTURES as of January 13, 2023 Close (\$/MMBtu)

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$3.53	(\$0.31)	\$3.84	\$3.54
2024	\$4.01	(\$0.08)	\$4.09	\$3.19
2025	\$4.19	(\$0.02)	\$4.21	\$3.10
2026	\$4.25	(\$0.01)	\$4.26	\$3.06
2027	\$4.30	-	\$4.30	\$3.08

INDUSTRY METRICS—QUICK SNAPSHOT

	Current	Last Week	WoW Change	%Change
Crude Oil Near-Month Price (\$/bbl)	\$78.32	\$73.97	\$4.35	6%
Natural Gas Near-Month Price (\$/MMBtu)	\$3.68	\$3.76	(\$0.09)	(2%)
Weekly Upstream-Deal Transaction Value (\$MM)	\$0.00	\$120.00	(\$120.00)	(100%)
Weekly Number of Upstream-Deal Transactions	0	1	(1)	(100%)
Current Total US Rig Count	775	772	3	0.4%
US Field Crude Oil Production (MMbbl/day)	12.2	12.1	0.1	0.8%
US Field Dry Natural Gas Production (Bcf/day)	105.8	105.8	-	0%
Commercial Crude Oil Stocks-Excluding SPR (MMbbl)	440	421	19	5%
Natural Gas Stocks-Working Gas Underground Storage (Bcf)	2,902	2,891	11	0.4%
Total Drilled But Uncompleted Wells (DUC-Last Month)	4,443	4,443	-	0%

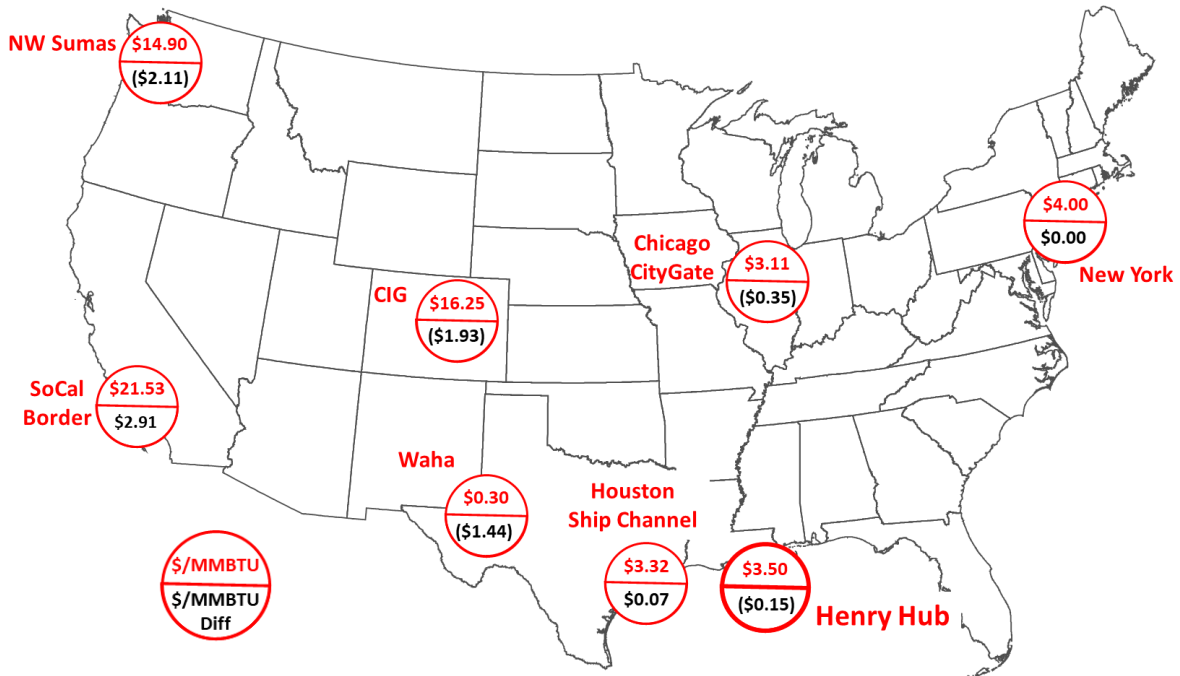
*Source—Energy Information Administration, United States (EIA)

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

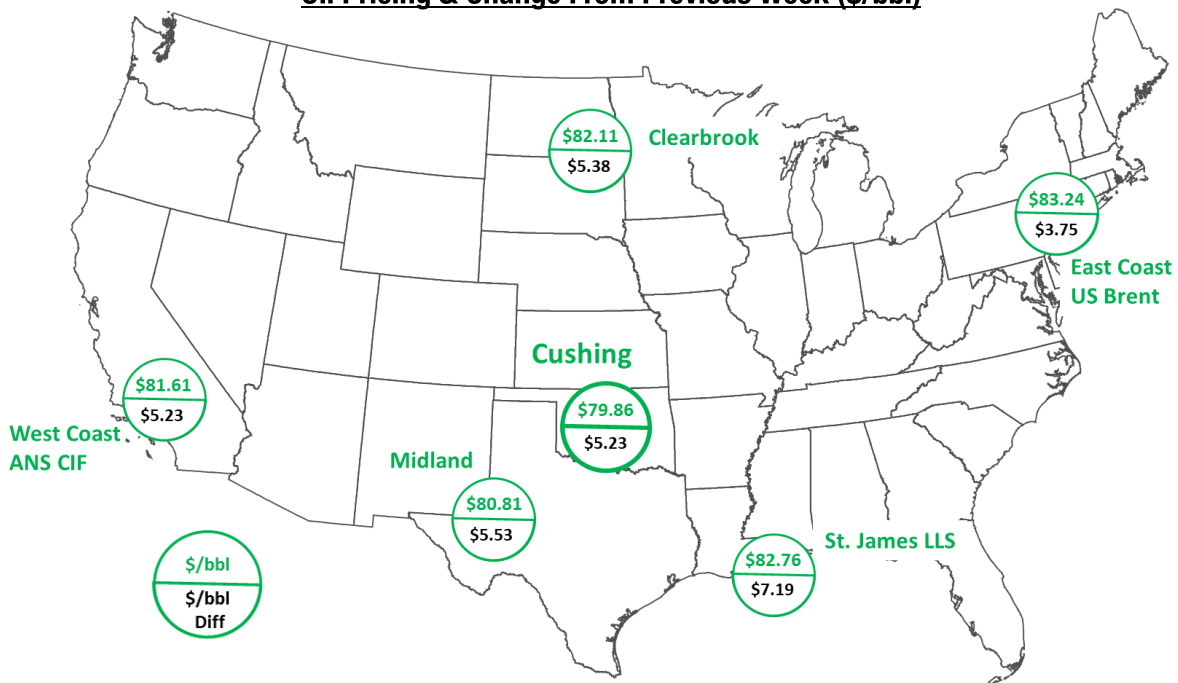


US COMMODITY PRICES CONTINUED

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



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



*Source—Bloomberg LP



SELECTED INDUSTRY HEADLINES

Oil Gains 3% On Global Economic Optimism, Despite Surprise U.S. Crude Build

Oil prices rose 3% to a one-week high on recently as hopes for an improved global economic outlook and concern over the impact of sanctions on Russian crude output outweighed a massive surprise build in U.S. crude stocks.

U.S. Oil Production Growth's Path Is Clear

How much will U.S. oil production grow this year—this is the question on a lot of minds, both in the United States itself, and across the world.

U.A.E. Names Oil Executive to Lead Climate Talks at COP28

Sultan Al Jaber, who heads the Abu Dhabi National Oil Company, was chosen by the United Arab Emirates to head the upcoming COP28 summit.

House Votes To Ban Sales From Strategic Petroleum Reserve To China

The House recently passed a bill to ban sales from the nation's Strategic Petroleum Reserve to China.

What The End Of The US Shale Revolution Would Mean For The World (LOGIN CREDENTIALS REQUIRED)

Fracking catapulted America to the top of the energy hierarchy, but low yields and a lack of reinvestment threaten that position.

Oil Up More Than 1% On U.S. Inflation Data, Demand Optimism

Oil prices gained about \$1 a barrel recently, supported by figures showing U.S. consumer prices unexpectedly fell in December and by optimism over China's demand outlook.

Iranian Oil Exports End 2022 At A High, Despite No Nuclear Deal

Iranian oil exports hit new highs in the last two months of 2022 and are making a strong start to 2023 despite U.S. sanctions, according to companies that track the flows, on higher shipments to China and Venezuela.

Kremlin Revenue Under Pressure as Crude Price Falls on Sanctions

The Russian state's oil revenue came under further pressure as the average crude price the government uses to calculate its taxes dropped to the lowest in more than two years.

Egypt's Natural Gas Exports Surge

Egypt saw its natural gas exports surge in 2022, a continuation of a trend that started eight years ago and was boosted by Europe's energy crisis.

Russia Forced To Use More Of Its Own Oil Tankers To Dodge Sanctions

Russia is increasing the number of its own oil tankers that it is using to deliver its crude oil to buyers.

China Dec Crude Oil Imports 3rd-Highest In Yr, 2022 Imports Down 0.9%

China's crude oil imports in December rose 4.2% from a year earlier to the third-highest in 2022 on a daily basis, data showed recently.

EU Approves \$1.2Bn Scheme For Danish CCS Technology

The European Commission has approved a \$1.2 billion Danish scheme to support the roll-out of carbon capture and storage (CCS) technologies.

EIA Data Shows Surprise U.S. Crude Stock Build After Winter Storm (LOGIN CREDENTIALS REQUIRED)

U.S. crude stocks built unexpectedly, the Energy Information Administration said, as refiners were slow to restore production after a cold freeze that shut operations.

Public Shale Drillers Take The Lead Over Private Oil Operators

Publicly traded oil operators such as Occidental Petroleum Corp. and EOG Resources Inc. have taken the lead in expanding shale drilling, displacing private companies that dominated the space for more than a year.

Higher Oil Prices Have Not Led to More Exploration

Higher oil prices in 2022 have not fed through into more exploration, according to a recent high impact drilling report, which noted that high impact well numbers in 2023 look to be in line with 2020-2022, "with 75-85 high impact wells currently expected to complete in the year".

Vegetable Oil Is Gaining Traction As A Biofuel

Interest in biofuels has exploded in recent years, and as governments pursue both energy security and lower emissions, that interest is only rising.



SELECTED RECENT TRANSACTIONS

HNCR Sponsored SPAC Files For \$120 Million Business Combination

Houston Natural Resources Corp. (HNRC) announced that its subsidiary Houston Natural Resources, Inc, through its majority owned HNRAC Sponsors, LLC, sponsored a Special Purpose Acquisition Corp (SPAC), HNR Acquisition Corp (HNRA), and entered into a membership purchase agreement with Pogo Resources and two affiliates (Pogo) for a purchase price of \$120 million dollars.

Arena Energy Announces Strategic Acquisition of Gulf of Mexico Shelf Properties from GOM Shelf, LLC

Arena Energy, LLC (“Arena”), a leading independent oil and gas exploration company focused on the Gulf of Mexico Shelf, recently announced it has closed on the acquisition of seven blocks and twelve platforms in the Gulf of Mexico from GOM Shelf, LLC.

PHX Minerals Reports Fiscal 2022 Results and Haynesville, SCOOP Acquisitions

PHX Minerals Inc. recently announced that it acquired 923 net royalty acres in the SCOOP and Haynesville plays for approximately \$13.5 million in its fiscal fourth quarter of 2022.

Maverick Energy Group Announces Pass Creek Resources LLC Acquisition

Maverick Energy Group, Ltd. recently announced its completed a transaction whereby Maverick will acquire 100% of the units of Pass Creek Resources, LLC.

Arena Energy Awarded Eleven Blocks in Lease Sale 257, Adding Over 50,000 Acres to Existing Footprint on Gulf of Mexico Shelf

Arena Energy LLC recently announced that it was awarded eleven leases in the U.S. Gulf of Mexico by the Bureau of Ocean Energy Management (BOEM) in Lease Sale 257.

IOG Resources II Announces Acquisition

IOG Resources II LLC recently announced that it acquired producing gas assets in Appalachia operated by Seneca Resources, an affiliate of National Fuel Gas.

Royale Announces New Joint Development Agreement In Permian Basin

Royale Energy Inc. recently announced that it executed a Joint Development Agreement (JDA) with Ares Energy Ltd. for up to 25,000 acres in Ector and Andrews counties, Texas in the Permian Basin. This “Pradera Fuego Project” is a horizontal resource play in the Mississippian interval.

Diamondback Energy Announces Northern Midland Basin Acquisition

Diamondback Energy Inc. recently announced that it entered into a definitive purchase agreement to acquire all leasehold interest and related assets of Lario Permian LLC, a wholly owned subsidiary of Lario Oil & Gas Company, and certain associated sellers in exchange for 4.18 million shares of Diamondback common stock and \$850 million of cash.

Jericho Energy Ventures Enters Into Agreement To Sell Portion Of Its Undeveloped Oklahoma STACK Acreage

Jericho Energy Ventures Inc. recently announced that its joint venture partner in the STACK JV has agreed to divest a portion of its undeveloped acreage in the prolific STACK oil region of Oklahoma to an offset operator for total net proceeds of \$1.37 million.

Diamondback Energy Completes Divestiture Of Non-Core Delaware Basin Acreage

Diamondback Energy Inc. recently announced that it completed the divestiture of non-core Delaware Basin acreage for net proceeds of \$155 million.

Pantheon Resources Acquires 40,000 Acres In North Slope Lease Sale

Pantheon Resources plc recently announced the successful acquisition of approximately 40,000 acres in the State of Alaska's North Slope Area-wide lease sale.

88 Energy Awarded Acreage In North Slope Lease Sale

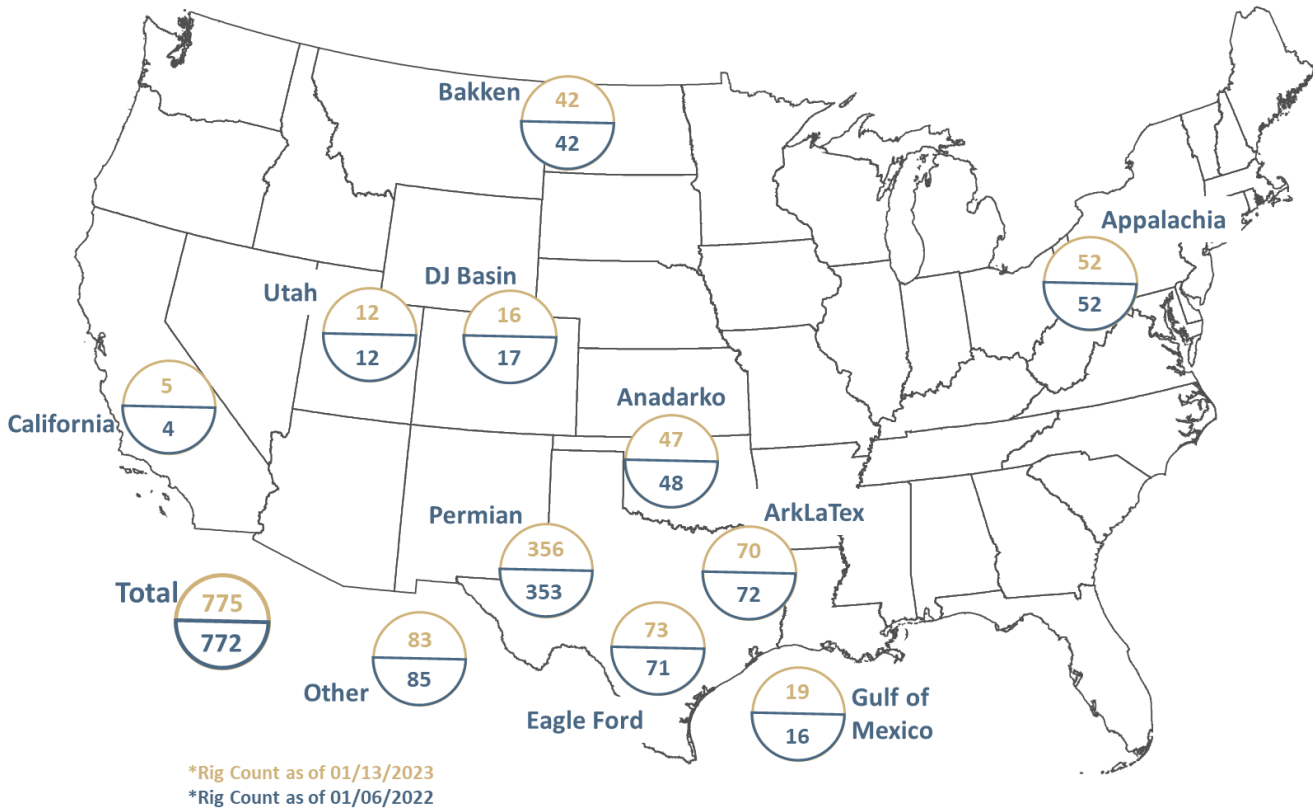
88 Energy Ltd. recently announced that its wholly owned subsidiary, Captivate Energy Alaska Inc., was declared the highest bidder for select acreage offered as part of the North Slope Areawide 2022W oil and gas lease sale.

Kimbell Royalty Partners LP Announces \$290 Million Permian Basin Acquisition In Cash & Unit Transaction

Kimbell Royalty Partners LP recently announced that it agreed to acquire mineral and royalty interests held by Austin-based Hatch Royalty LLC in a cash and unit transaction valued at approximately \$290 million.



RIG ACTIVITY BY US REGION

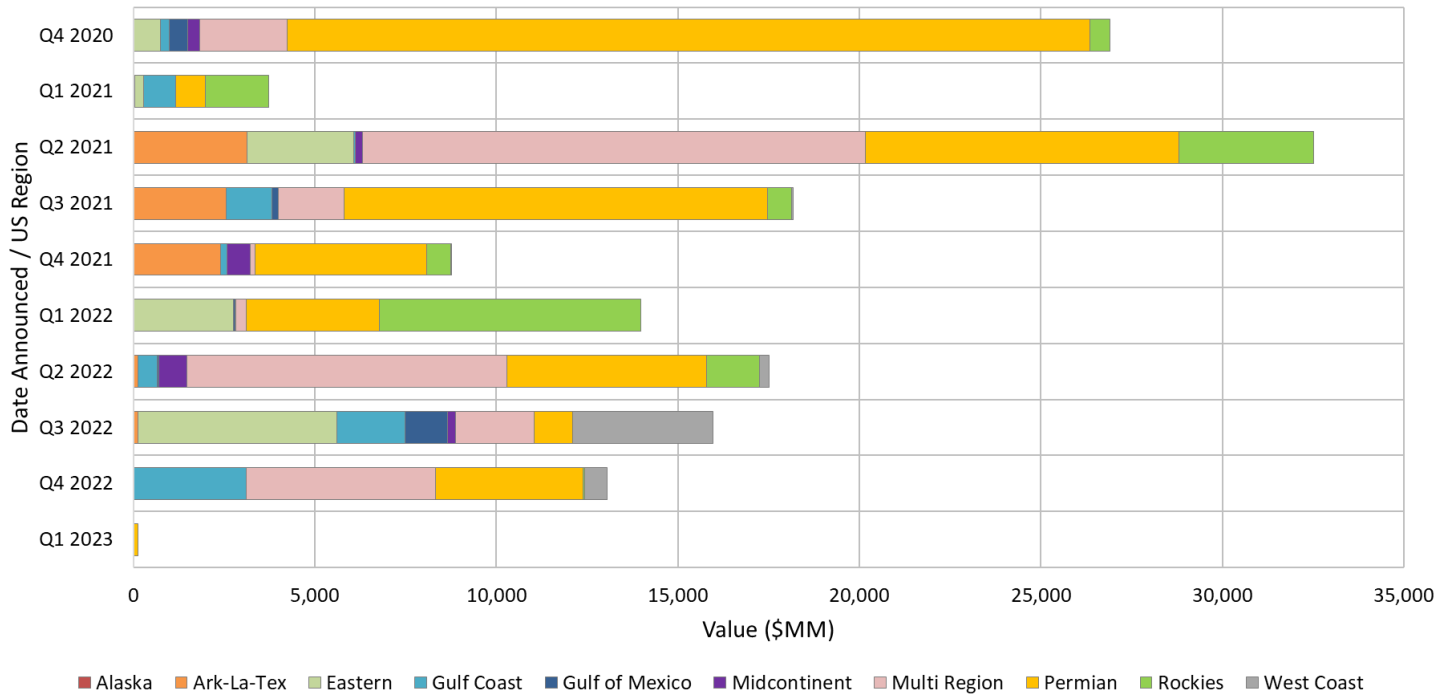


	Week Ending 01/13/2023			Week Ending 01/06/2022		Week Ending 01/14/2022
U.S. Rig Breakouts	Count	+/-	Count	+/-	Count	
Oil	623	5	618	131	492	
Gas	150	(2)	152	41	109	
Not Specified	2	0	2	2	0	
Directional	49	3	46	14	35	
Horizontal	700	0	700	159	541	
Vertical	26	0	26	1	25	
Land (Inc Others)	754	0	754	173	581	
Inland Waters	2	0	2	0	2	
Offshore	19	3	16	1	18	
US Total	775	3	772	174	601	

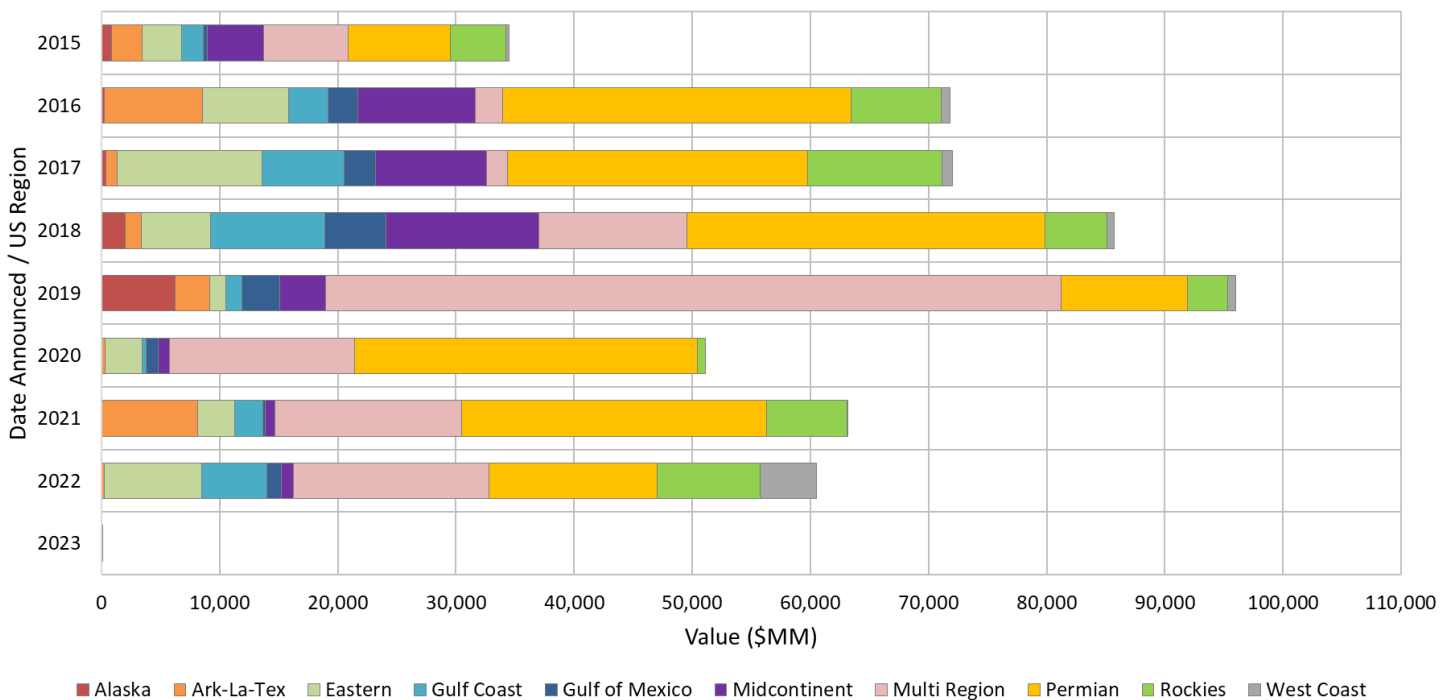
*Source—Baker Hughes Weekly Rig Counts



DEAL VALUE BY US REGION (BY QUARTER)



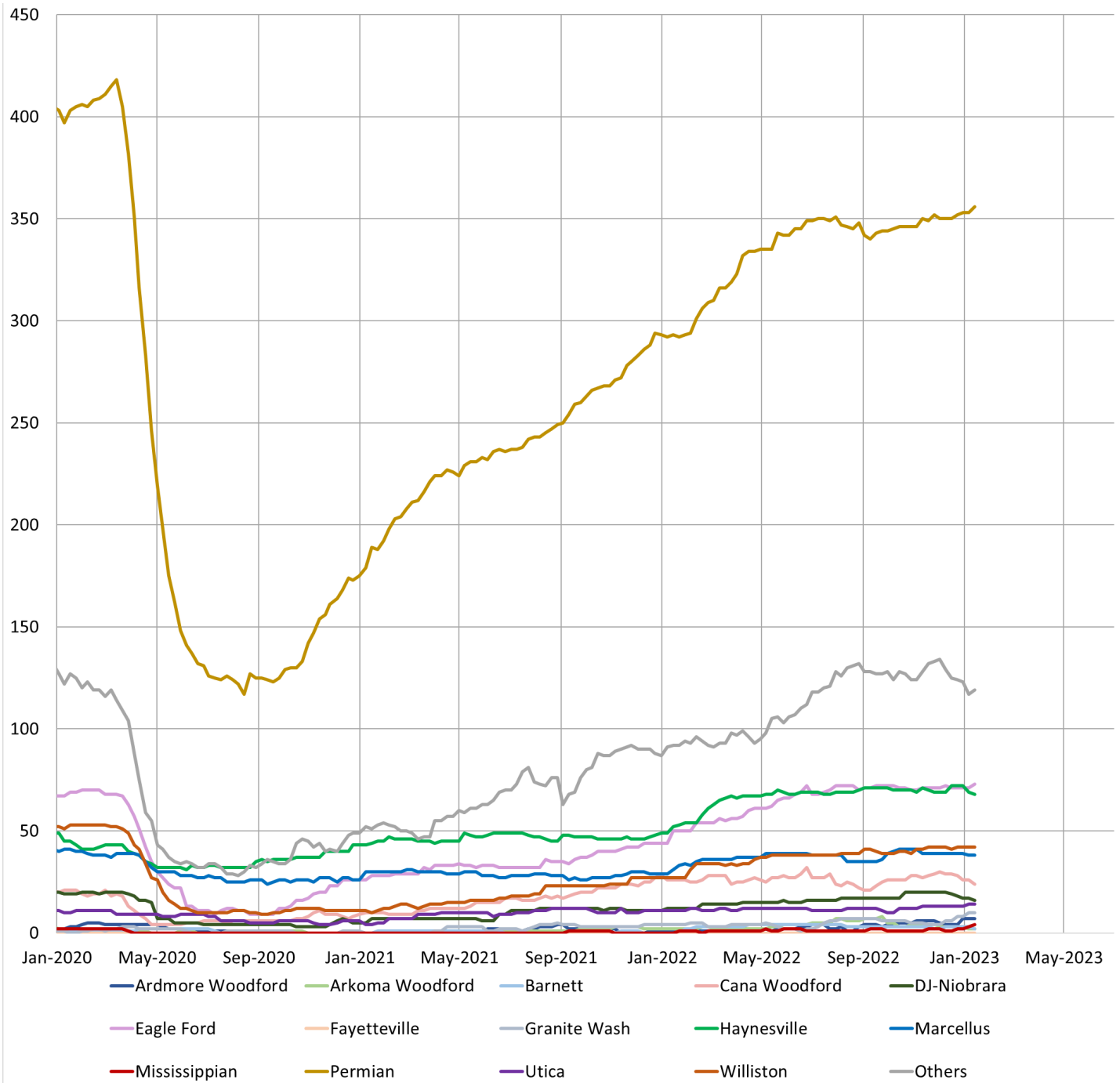
DEAL VALUE BY US REGION (BY YEAR)



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



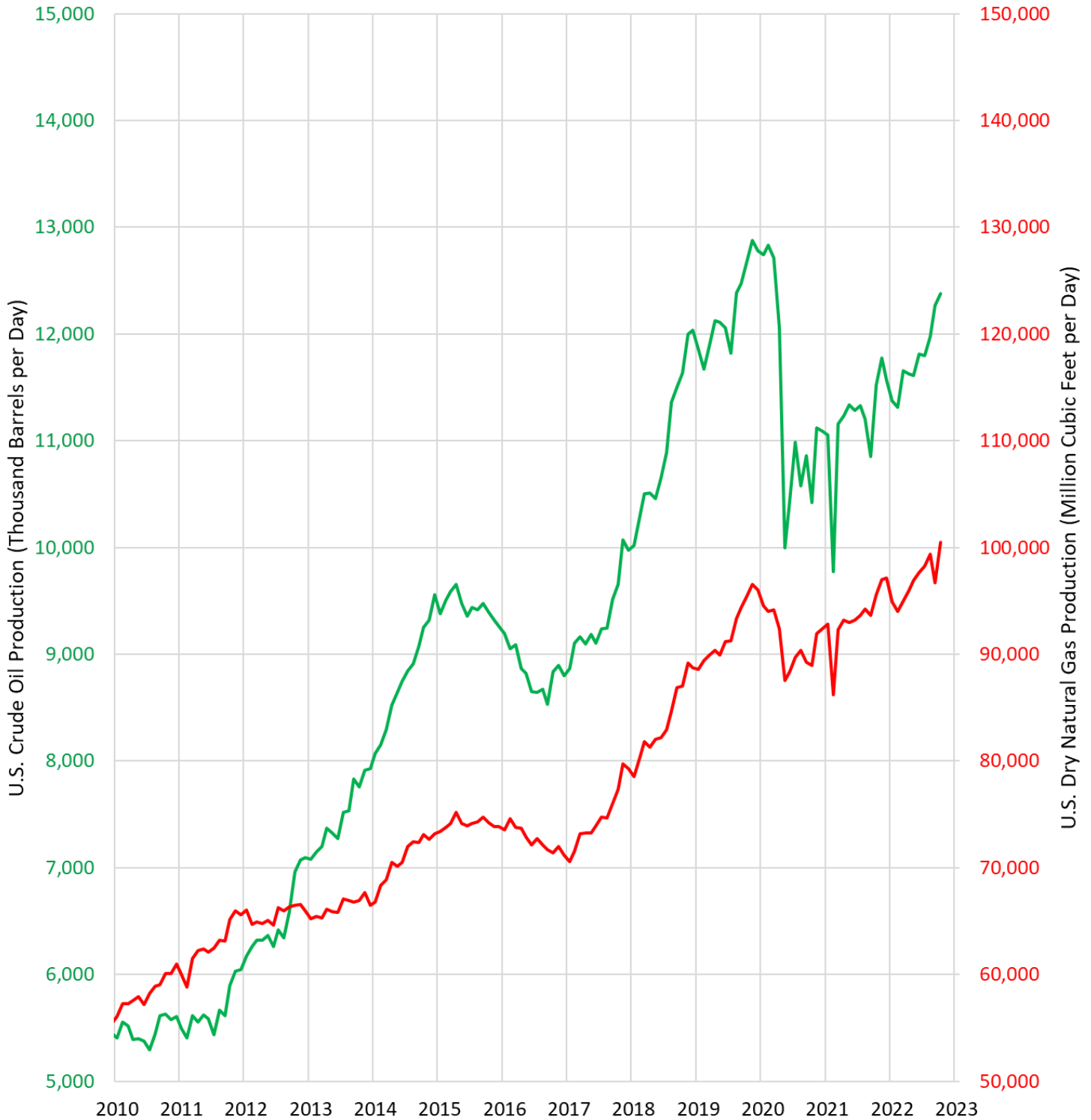
RIG ACTIVITY BY US REGION



*Source—Baker Hughes Weekly Rig Counts



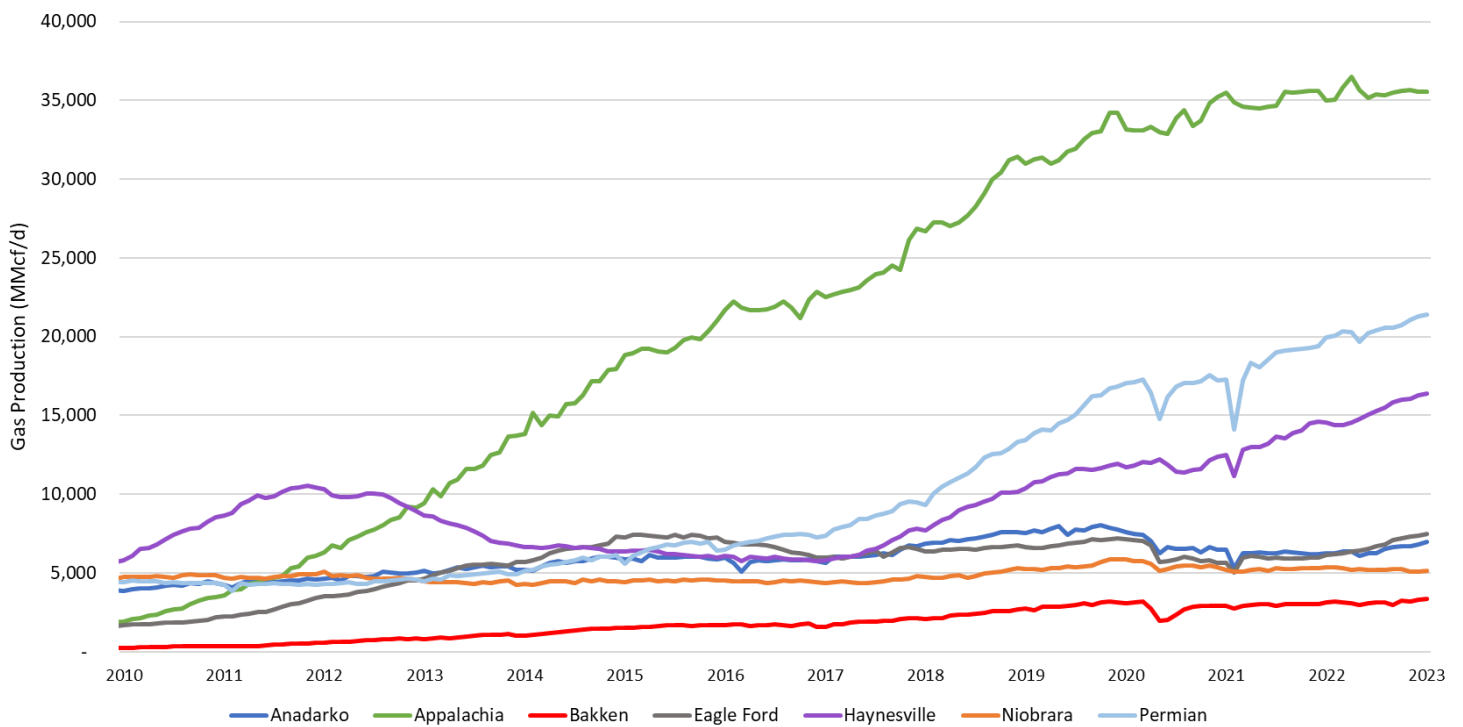
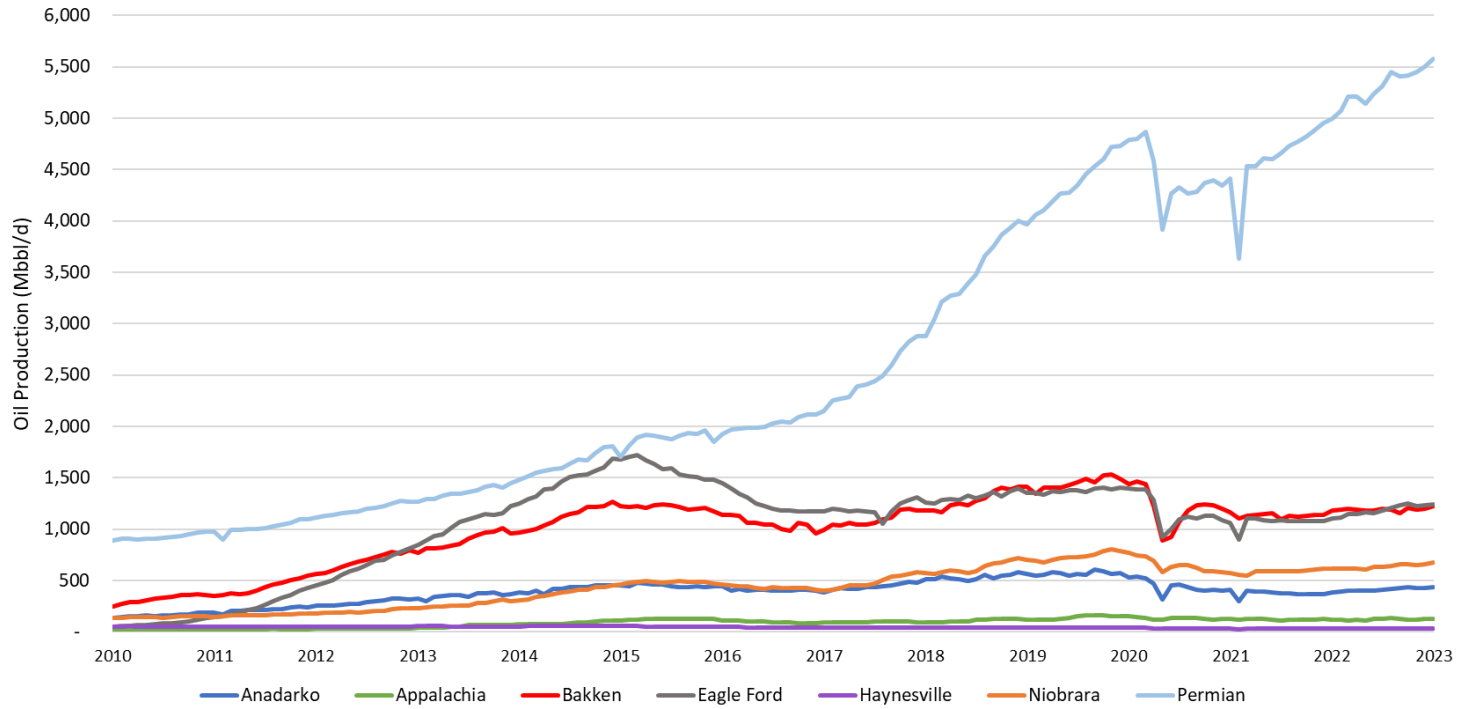
US DAILY CRUDE (MMbbl) & DRY NATURAL GAS PRODUCTION (MMcf)



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



HISTORICAL PRODUCTION OF SELECTED US SHALE REGIONS



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



UPCOMING EVENTS

January 2023

[IPAA Private Capital Conference](#)

January 19

Houston, TX

[SPE Hydraulic Fracturing Technology Conference & Exhibition](#)

January 31-
February 1

The Woodlands, TX

February 2023

[NAPE Summit 2023](#)

February 1-3

Houston, TX

[Argus Americas Crude Summit](#)

February 15-17

Houston, TX

[GoM Energy Transformation Conference](#)

February 21

Houston, TX

March 2023

[CERAWeek 2023](#)

March 6-10

Houston, TX

[4th American LNG Forum](#)

March 13-14

Houston, TX

[DUG Haynesville Conference & Exhibition](#)

March 28-29

Shreveport, LA

May 2023

[Offshore Technology Conference 2023](#)

May 1-4

Houston, TX

[DUG Permian Basin & Eagle Ford Conference & Exhibition](#)

May 22-24

Fort Worth, 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 two years of reserves engineering experience. Before RED, David was a Petroleum Engineer at Energy Advisors Group where he handled the technical processes for marketed conventional and unconventional assets across the Lower 48. He began his career with Longfellow Energy where he contributed to its engineering, operations, and A&D teams. David holds an MBA from The University of Texas Permian Basin and a B.S. in Petroleum Engineering from The University of Oklahoma.

