



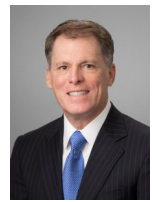
# Weekly E&P Update

May 16, 2023

Vol. 19

## Pumped Hydropower Storage

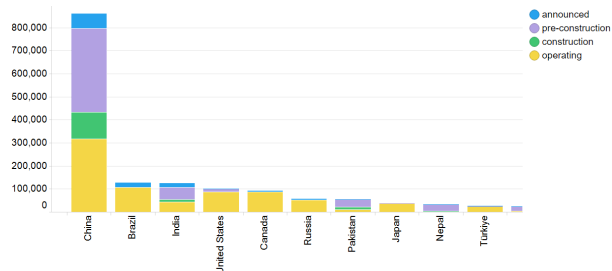
By Steve Hendrickson  
President of Ralph E. Davis Associates



One of the challenges we face in expanding the use of renewable power sources in the electric grid is the inability to store excess power from those sources when they're unavailable, like when the sun isn't shining or the wind isn't blowing. It's estimated that without reliable sources of meaningful energy storage, solar and wind electricity can only contribute around **20 to 40%** of the electrical supply before the grid starts encountering reliability issues. Historically, batteries have been considered the go-to solution for energy storage, but there are significant issues with grid-scale battery deployment in the United States, especially our heavy reliance on [foreign sources of rare earth metals](#).

However, another storage alternative has been around for quite some time and is currently experiencing substantial growth: pumped hydropower storage, also known as pumped hydro energy storage (PHES). PHES involves utilizing excess energy to pump water into a reservoir situated at a higher elevation. During high electricity demand, the water from the reservoir is released through large pipes to a lower elevation, driving electrical turbines in the process. While this storage method isn't new, an impressive installation in Tennessee called the [Raccoon Mountain Pumped-Storage Plant](#) was constructed by the Tennessee Valley Authority in 1970. It is [TVA's largest hydroelectric generating facility](#).

[Recent reports indicate](#) that pumped storage has expanded and is projected to continue growing. China currently dominates the use of pumped storage, with the majority of newly-announced projects and those under construction, as stated by Global Energy Tracker. The chart below displays the amount of pumped hydropower in megawatt-hours for the top ten countries. To put things in perspective, a megawatt-hour is sufficient to power approximately 750 homes for one hour.



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(Source: Global Energy Tracker)

Despite the attractive features of pumped hydropower, there, unfortunately, aren't many new projects expected in the United States. [Likely reasons](#) for this lack of development include costs, conflicts related to land use, unfavorable topography, and regulatory hurdles.

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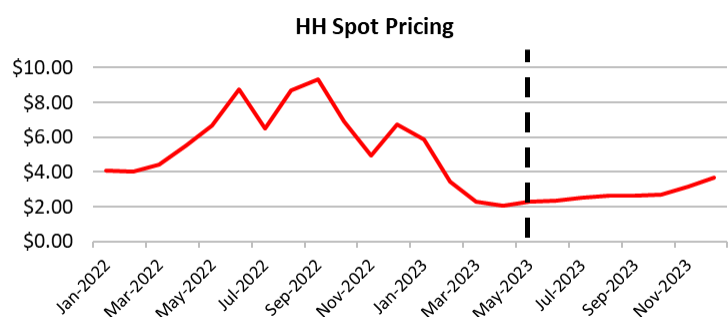
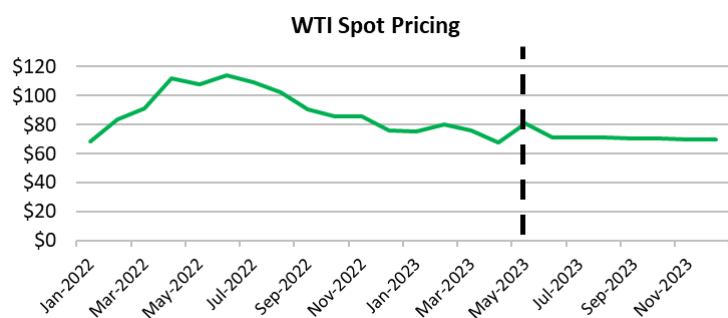
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## NYMEX FUTURE PRICING



## MONDAY'S MARKET CLOSE

### **NYMEX WTI CRUDE OIL FUTURES as of May 15, 2023 Close (\$/bbl)**

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$70.45	(\$1.85)	\$72.30	\$89.89
2024	\$67.64	(\$1.34)	\$68.98	\$80.42
2025	\$65.02	(\$0.95)	\$65.97	\$73.86
2026	\$63.02	(\$0.77)	\$63.79	\$69.11
2027	\$61.24	(\$0.71)	\$61.95	\$65.89

### **NYMEX HH NATURAL GAS FUTURES as of May 15, 2023 Close (\$/MMBtu)**

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$2.81	\$0.12	\$2.69	\$5.38
2024	\$3.55	\$0.05	\$3.50	\$4.25
2025	\$4.15	(\$0.01)	\$4.16	\$4.08
2026	\$4.20	(\$0.04)	\$4.24	\$4.15
2027	\$4.19	(\$0.04)	\$4.23	\$4.23

## INDUSTRY METRICS—QUICK SNAPSHOT

	<b>Current</b>	<b>Last Week</b>	<b>WoW Change</b>	<b>%Change</b>
Crude Oil Near-Month Price (\$/bbl)	\$71.42	\$71.35	\$0.07	0.1%
Natural Gas Near-Month Price (\$/MMBtu)	\$2.19	\$2.15	\$0.04	2%
Weekly Upstream-Deal Transaction Value (\$MM)	\$544.70	\$1,730.00	(\$1,185.30)	(69%)
Weekly Number of Upstream-Deal Transactions	4	3	1	33%
Current Total US Rig Count	731	748	(17)	(2%)
US Field Crude Oil Production (MMbbl/day)	12.3	12.3	-	0%
US Field Dry Natural Gas Production (Bcf/day)	105.6	106.8	(1)	(1%)
Commercial Crude Oil Stocks-Excluding SPR (MMbbl)	463	460	3	0.6%
Natural Gas Stocks-Working Gas Underground Storage (Bcf)	2,141	2,063	78	4%
Total Drilled But Uncompleted Wells (DUC-Last Month)	4,676	4,676	-	0%

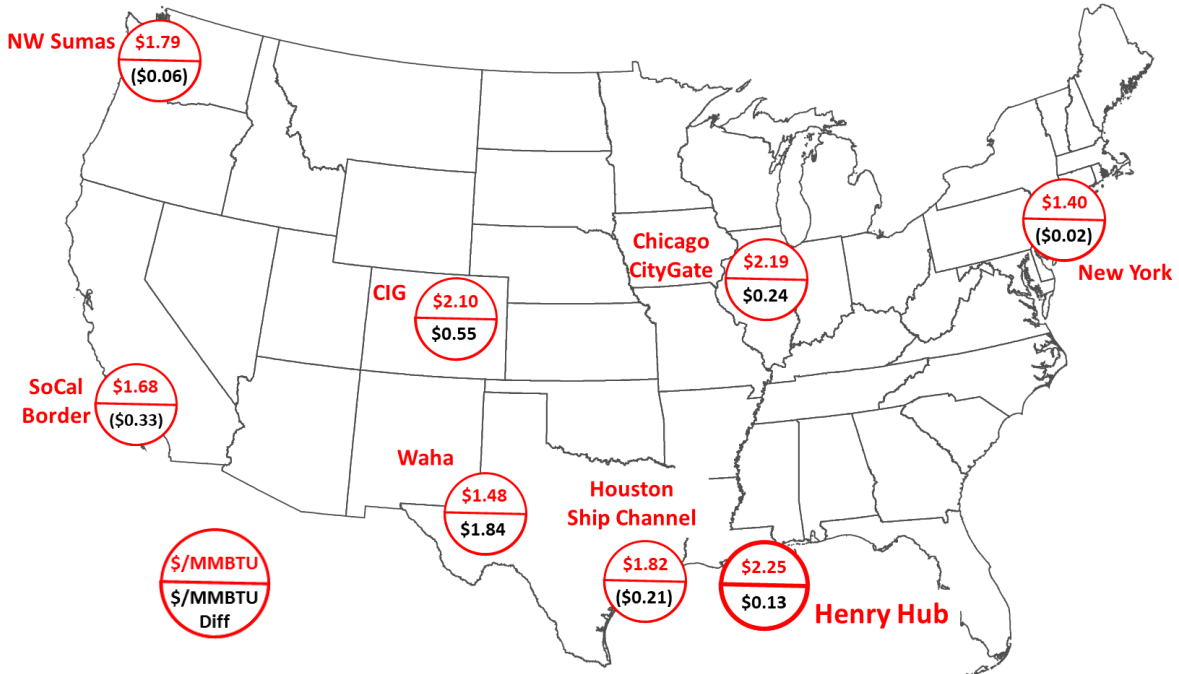
\*Source—Energy Information Administration, United States (EIA)

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

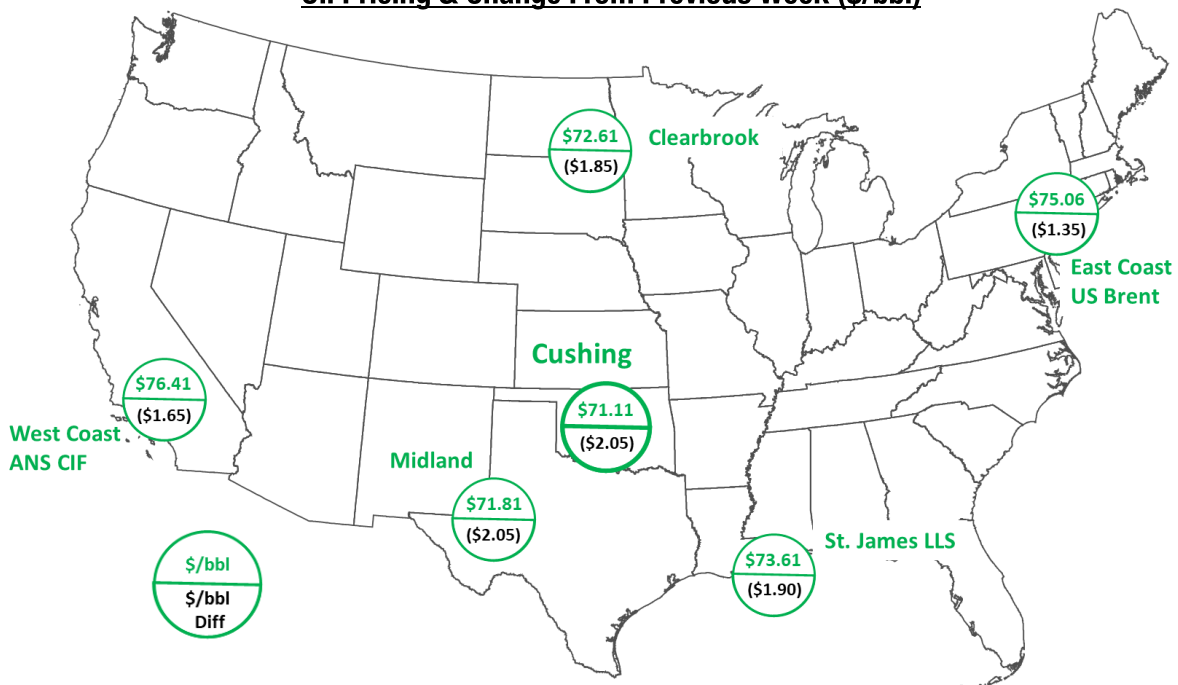


**US COMMODITY PRICES CONTINUED**

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



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



\*Source—Bloomberg LP



## **SELECTED INDUSTRY HEADLINES**

### **OPEC Cut Failed To Lift Oil Prices, But The Year Isn't Over Yet**

Crude oil prices have been on a losing streak for four consecutive weeks now, erasing all the gains they booked after OPEC's latest supply cut announcement as economic fears take precedence over demand expectations.

### **Biden Administration To Buy 3 Million Barrels Of Oil To Begin Replenishing Emergency Oil Stockpile**

The Biden administration announced plans on Monday to buy 3 million barrels of crude oil, marking the start of a years-long process aimed at replenishing America's depleted emergency oil stockpile.

### **The Energy Transition Has A Metals Problem**

A transition to net zero would thus require much more copper than we are producing now on a global scale, and copper is only one of a dozen of metals that was expected to be in deficit this year.

### **Houston Is Attracting Oil Flows Again Amid Record-High U.S. Crude Exports**

Houston is attracting crude flows via pipelines again as record-high U.S. oil exports have resulted in a surge in pipeline utilization to the top-exporting hub of Corpus Christi, analysts told Reuters.

### **U.S. Shale Production Set To Rise To Highest On Record In June -EIA (LOGIN CREDENTIALS REQUIRED)**

U.S. oil output from the seven biggest shale basins is due to rise in June to the highest on record, data from the Energy Information Administration showed recently.

### **New Rules for Power Plants Could Give Carbon Capture a Boost. Here's How.**

The technology has struggled to gain traction, but strict new emissions limits for gas and coal stations could encourage broader adoption.

### **North Sea Body Says 22 Projects in the Pipeline**

North Sea operators plan to progress 22 projects in the coming years, which, subject to robust emissions checks, would target 1.5 billion barrels, the North Sea Transition Authority (NSTA) said in a statement posted on its site recently.

### **Oil Price Dip Ignores Burgeoning Chinese Demand And Imminent Supply Crunch, IEA Warns**

The ongoing pressure in oil prices neglects an accelerating demand outlook and looming supply tightness, the Paris-based International Energy Agency warned roughly three weeks ahead of OPEC and OPEC+ meetings to review the producer alliance's output strategy.

### **Russia Hasn't Made Its Pledged Crude-Output Cuts, the IEA Says (LOGIN CREDENTIALS REQUIRED)**

Russia hasn't implemented its pledged crude-output cuts, with exports hitting a postwar high as Moscow seeks to boost energy revenue to fund military spending, according to the International Energy Agency.

### **Oil Steadies As IEA Turns More Bullish On Oil Demand**

Oil futures steadied as support from a higher global demand forecast from the IEA was countered by weaker than expected Chinese economic data.

### **Tight Market For Sour Crude Oil To Squeeze U.S. Gulf Coast Refiners (LOGIN CREDENTIALS REQUIRED)**

Sour crude oil supplies for U.S. Gulf Coast oil refiners will be squeezed in coming weeks, market participants said, as global demand rises following this month's OPEC+ production cut.

### **Pakistan Wants To Pay In Chinese Yuan For Russia's Crude Oil**

Pakistan hopes that it can pay for future Russian oil deliveries in Chinese yuan, although it has only bought one crude oil cargo from Russia so far.



## **SELECTED RECENT TRANSACTIONS**

### **Trio Petroleum Corp. Signs Acquisition Agreement to Acquire up to 100% of Producing Asset**

Trio Petroleum Corp. recently announced the signing of an Acquisition Agreement to potentially acquire up to 100% of the working interest in the Union Avenue Field located in Bakersfield, California.

### **Canada Energy Partners Announces Signing Of Participation Agreement With Wandoo Energy LLC For The Development Of The Kuester-Ochoa Project And Concurrent Unit Financing Of \$2M**

Canada Energy Partners Inc. recently announced that they have determined that a lower capital cost acquisition opportunity will satisfy the current capital market appetite in the junior energy markets, so they have entered into a Participation Agreement with Wandoo Energy LLC, a Texas based oil & gas company.

### **Vital Energy To Acquire Permian Assets For \$540 mln**

Vital Energy Inc VTLE.N said recently it would acquire Permian assets of Forge Energy II Delaware, an EnCap portfolio company, in a \$540 million all-cash deal.

### **Crescent Energy Announces Accretive Eagle Ford Bolt-On; Acquires Operated Interest In Existing Non-Operated Assets**

Crescent Energy Company announced that it has entered into a definitive purchase agreement to acquire operatorship and incremental working interest in its existing Western Eagle Ford assets from Mesquite Energy, Inc. for total consideration of \$600 million in cash, subject to customary purchase price adjustments.

### **Callon To Acquire Core Delaware Basin Assets And Exit Eagle Ford**

Callon Petroleum Company (“Callon”) signed two definitive agreements that streamline and focus Callon’s operations, accelerate the achievement of its debt reduction target and allow for the initiation of a shareholder return program in third quarter of 2023.

### **Elk Range Royalties Announces Mineral And Royalty Acquisition In The Eagle Ford Basin**

Elk Range Royalties (“Elk Range”) is pleased to announce it has acquired certain Eagle Ford Basin mineral and royalty interests (“the Acquired Assets”) from an undisclosed private seller.

### **U.S. Energy Development Corp. Expands Footprint In Permian Basin With \$225M Investment**

U.S. Energy Development Corp., an Arlington-based exploration and production company, has acquired a 25% working interest in the Mascot Project, a stacked pay asset in core Midland Basin for \$225 million cash and other considerations, the company announced.

### **88 Energy Awarded New Alaskan North Slope Block**

88 Energy Ltd., Perth, has been awarded a new exploration block (Project Leonis) on the North Slope of Alaska, about 15km southwest of the town of Deadhorse and 25km north of the operator’s Project Phoenix block.

### **Japan’s Mitsui Buys U.S. Gas Asset In ‘Pragmatic Solution’ For Energy Transition**

Japan’s Mitsui & Co Ltd., has bought a 92% stake in an unconventional gas asset in Texas and plans to promote its gas business as a “pragmatic solution” for the energy transition, it said on Thursday.

### **Kimbell Royalty Partners, LP Announces \$143.1 Million Midland Basin Mineral and Royalty Acquisition**

Kimbell Royalty Partners, LP has entered into an agreement to acquire Midland Basin mineral and royalty assets in Texas from MB Minerals LP, a subsidiary of Sabalo Holdings LLC (backed by EnCap Investments).

### **Ovintiv To Acquire Leasehold Interest And Related Assets**

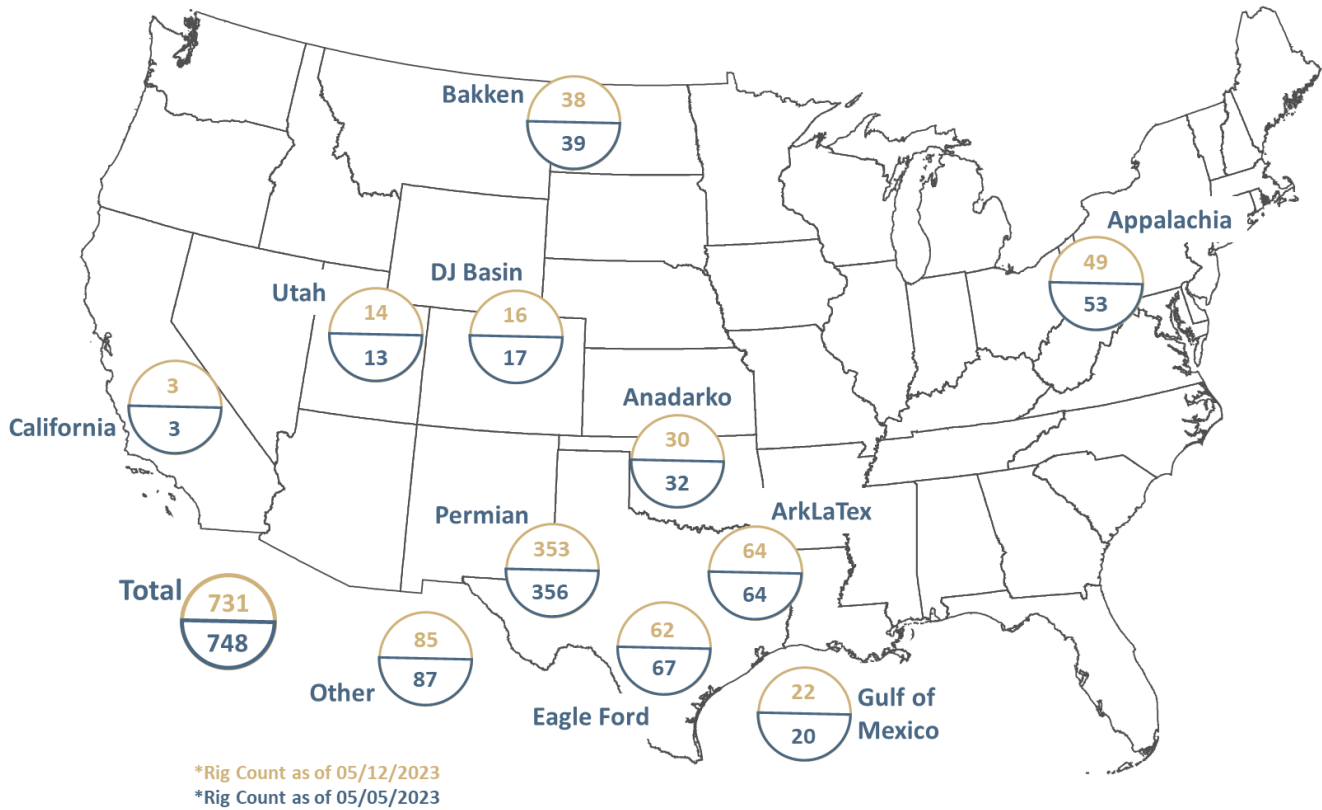
Ovintiv Inc has entered into agreements to divest its Bakken assets in North Dakota to Grayson Mill Bakken LLC, an affiliate of Grayson Mill Energy LLC.

### **Ovintiv To Acquire \$4.2B Midland Basin Assets**

Ovintiv Inc has entered into a definitive purchase agreement to acquire substantially all leasehold interest and related assets of Black Swan Oil & Gas LLC, PetroLegacy Energy II LLC, and Piedra Energy III LLC.



## RIG ACTIVITY BY US REGION

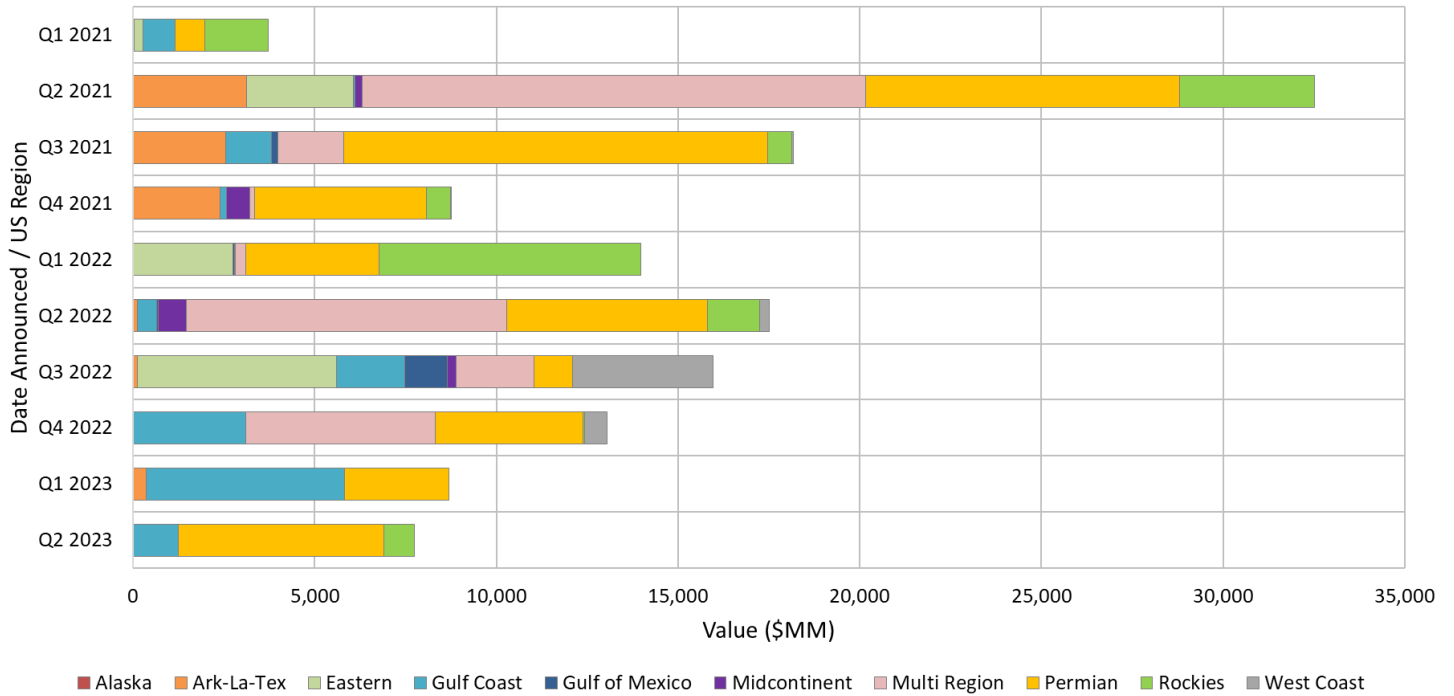


	Week Ending 05/12/2023			Week Ending 05/05/2023		Week Ending 05/13/2022
U.S. Rig Breakouts	Count	+/-	Count	+/-	Count	
Oil	586	(2)	588	23	563	
Gas	141	(16)	157	(8)	149	
Not Specified	4	1	3	2	2	
Directional	52	1	51	14	38	
Horizontal	660	(16)	676	9	651	
Vertical	19	(2)	21	(6)	25	
Land (Inc Others)	707	(18)	725	12	695	
Inland Waters	2	0	2	1	1	
Offshore	22	1	21	4	18	
<b>US Total</b>	<b>731</b>	<b>(17)</b>	<b>748</b>	<b>17</b>	<b>714</b>	

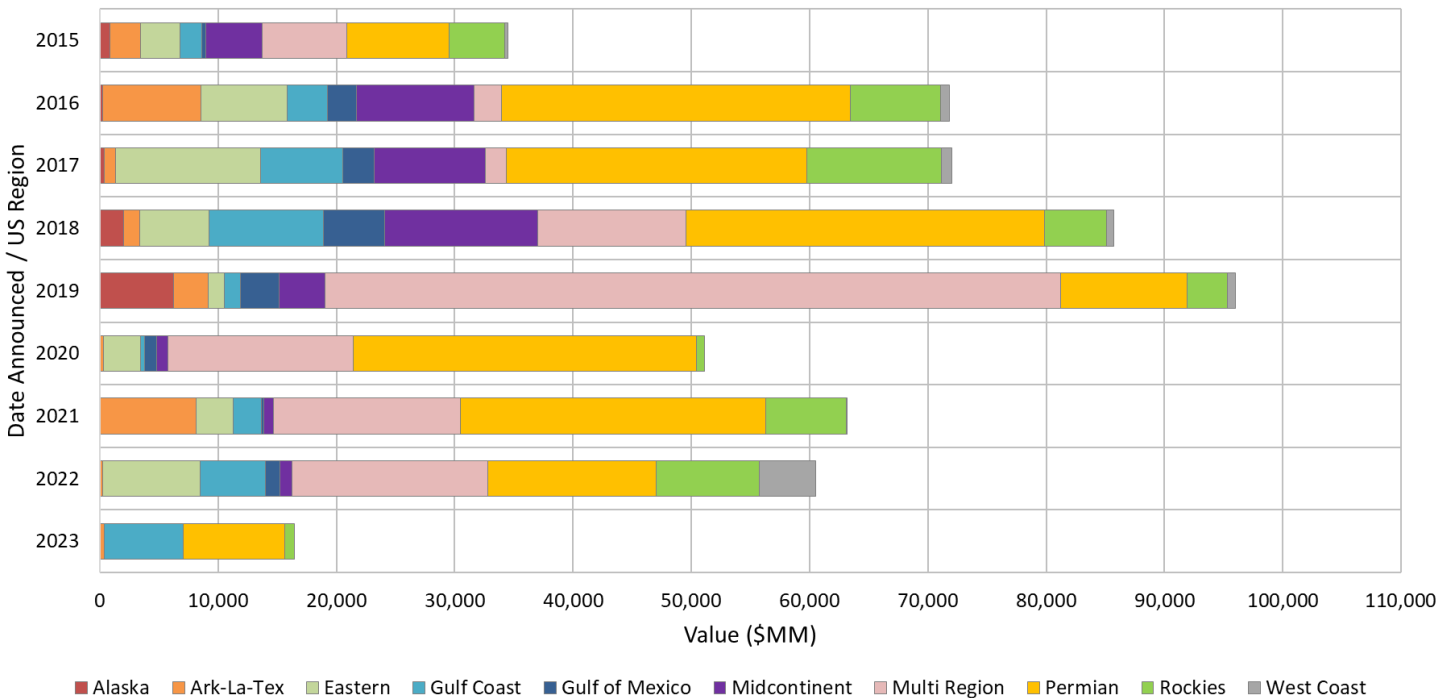
\*Source—Baker Hughes Weekly Rig Counts



## DEAL VALUE BY US REGION (BY QUARTER)



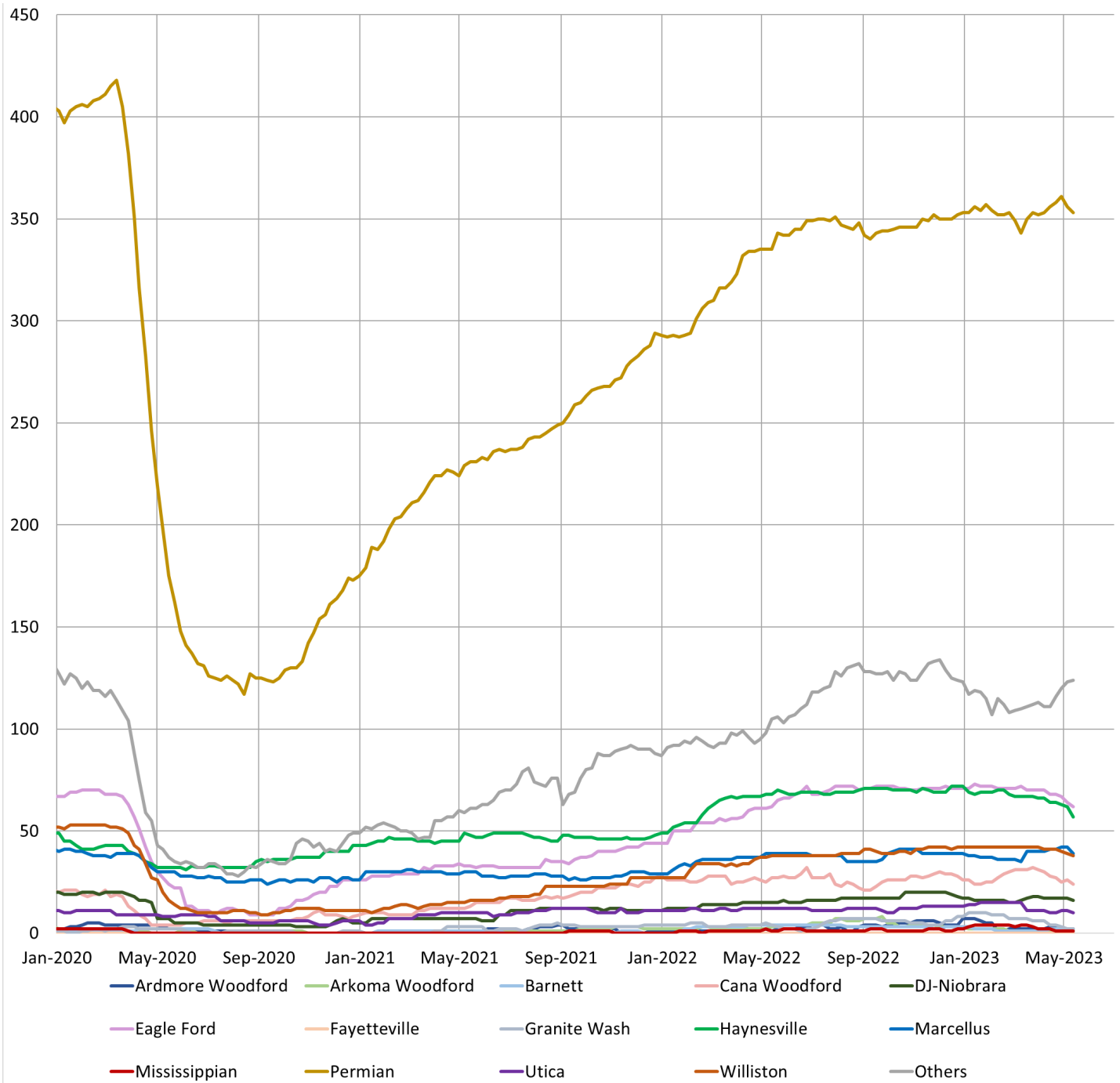
## DEAL VALUE BY US REGION (BY YEAR)



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



## RIG ACTIVITY BY US REGION

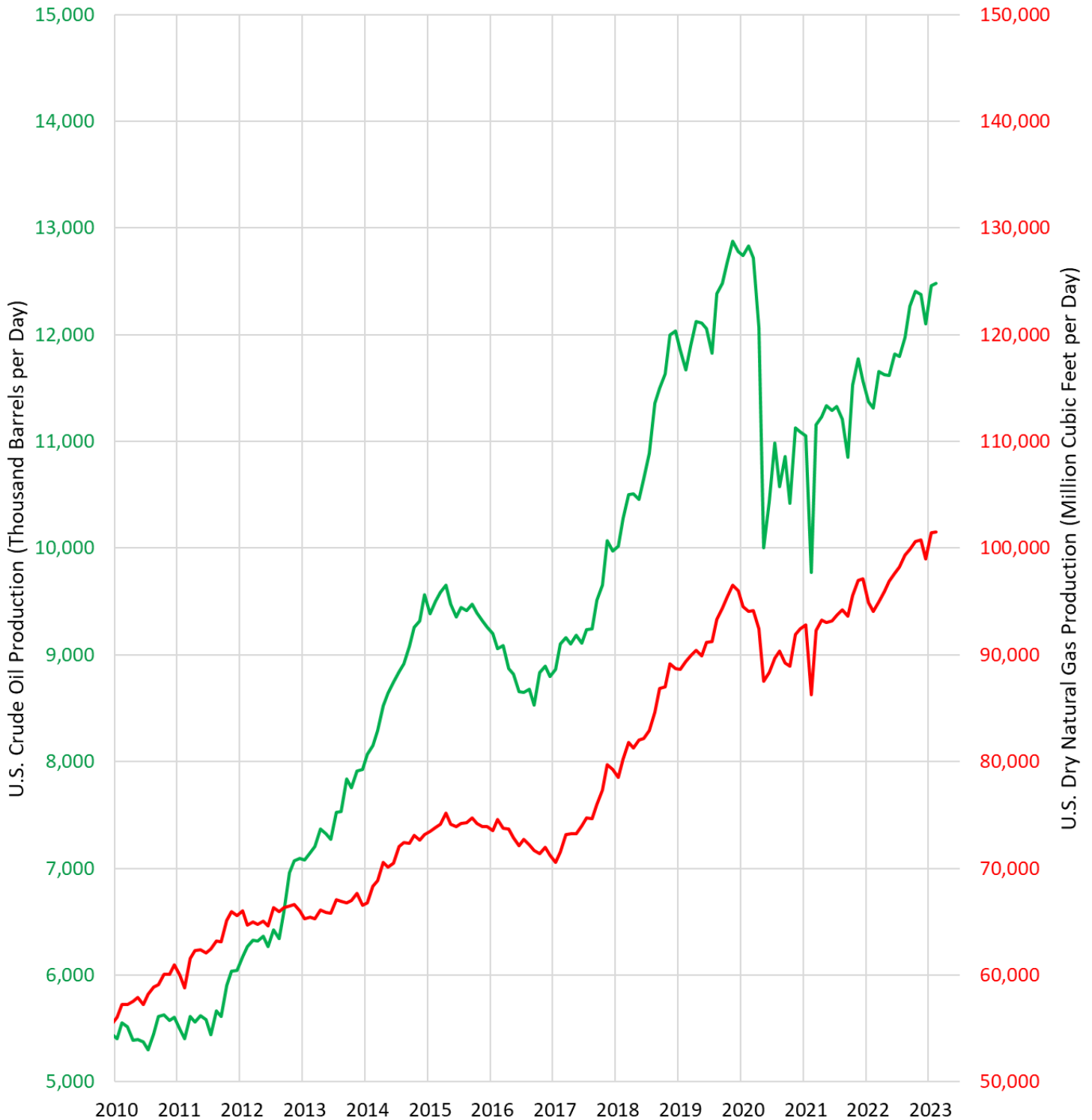


\*Source—Baker Hughes Weekly Rig Counts





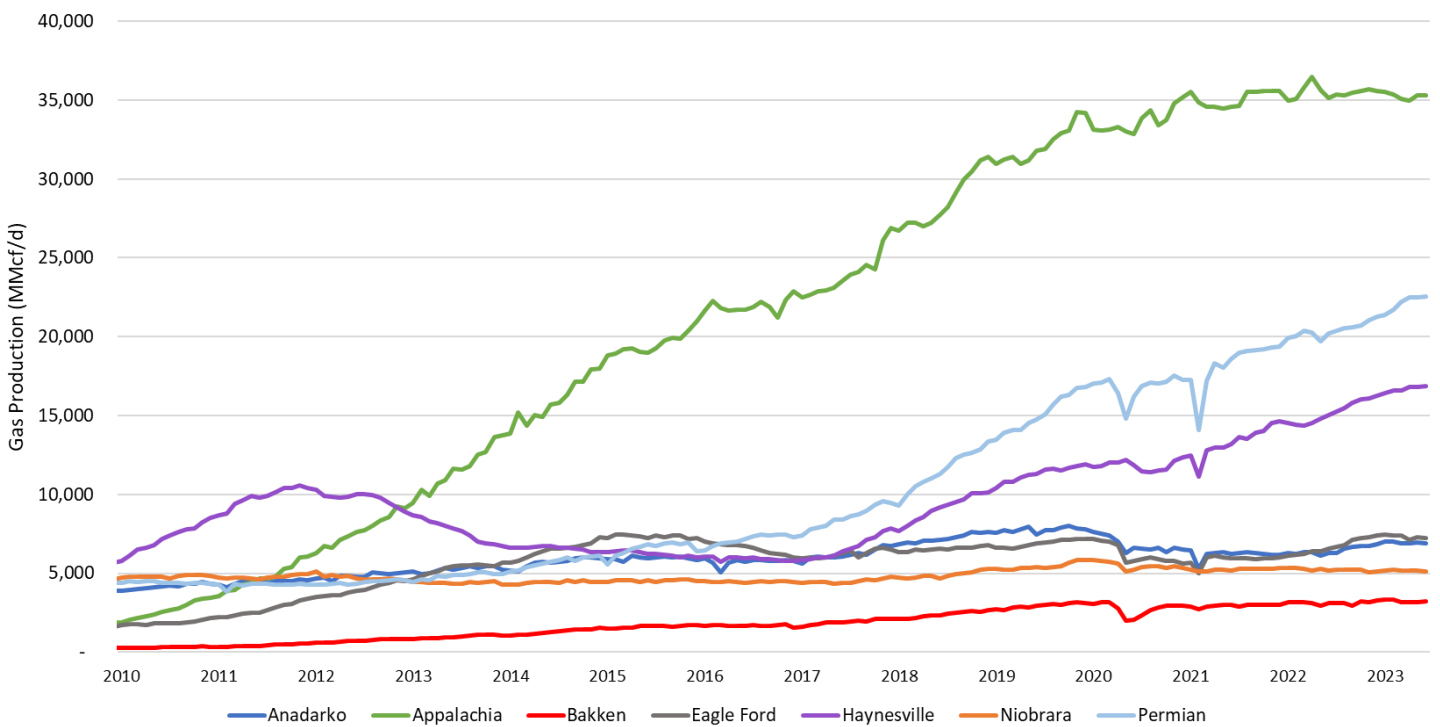
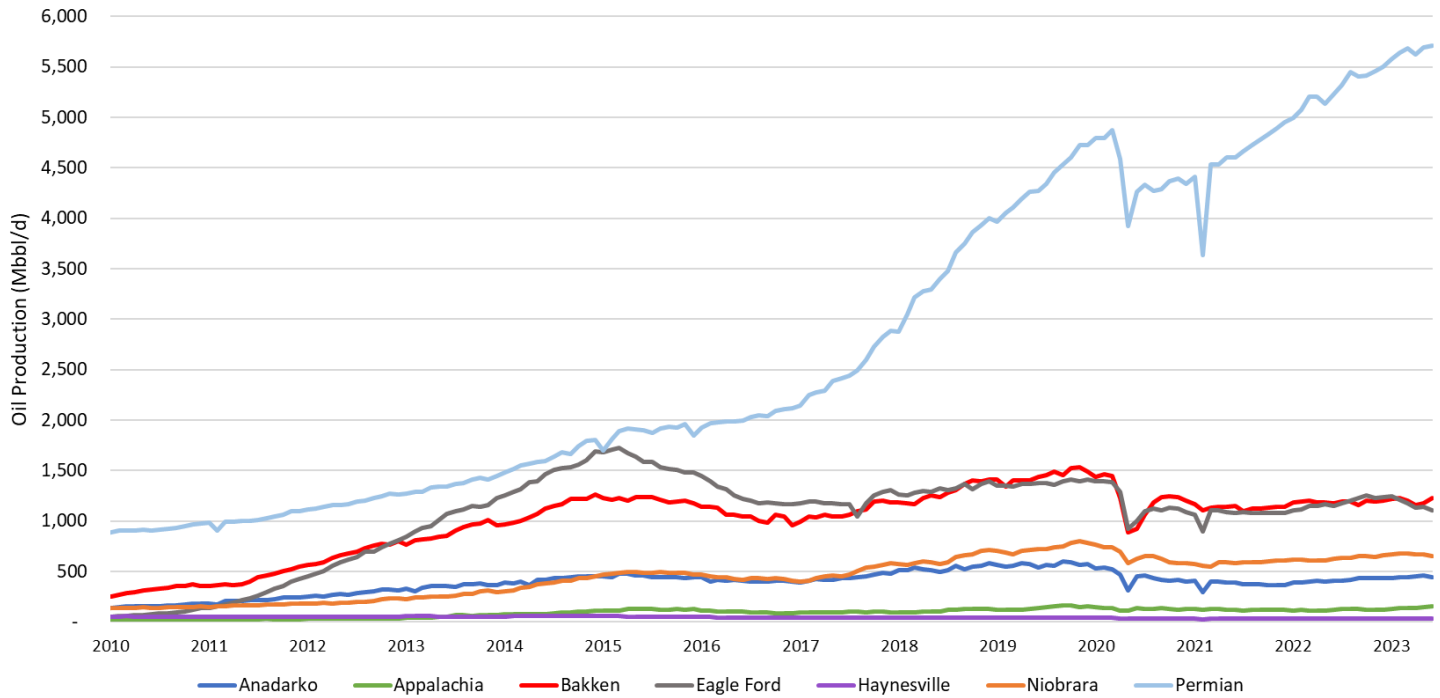
**US DAILY CRUDE (MMbbl) & DRY NATURAL GAS PRODUCTION (MMcf)**



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



## HISTORICAL PRODUCTION OF SELECTED US SHALE REGIONS



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



## **UPCOMING EVENTS**

### **May 2023**

<a href="#"><u>North American Petroleum Accounting Conference</u></a>	May 18-19	Dallas, TX
<a href="#"><u>DUG Permian Basin &amp; Eagle Force Conference &amp; Exhibition</u></a>	May 22-24	Fort Worth, TX
<a href="#"><u>Society of Petroleum Engineers Business Development - Oil and Gas Startups</u></a>	May 25, 2023	Houston, TX

### **June 2023**

Society Of Petroleum Evaluation Engineers (SPEE) Annual Meeting	June 17-20	Newport, RI
<a href="#"><u>Telluride Executive Series</u></a>	June 27-29	Telluride, CO

### **July 2023**

Banff Energy Summit	July 12-14	Banff, Alberta, Canada
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### **August 2023**

\*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.

