

Baker Hughes Oil Rig and Primary Vision Frac Spread Counts

13 October 2023

PRINCETON
ENERGY
ADVISORS



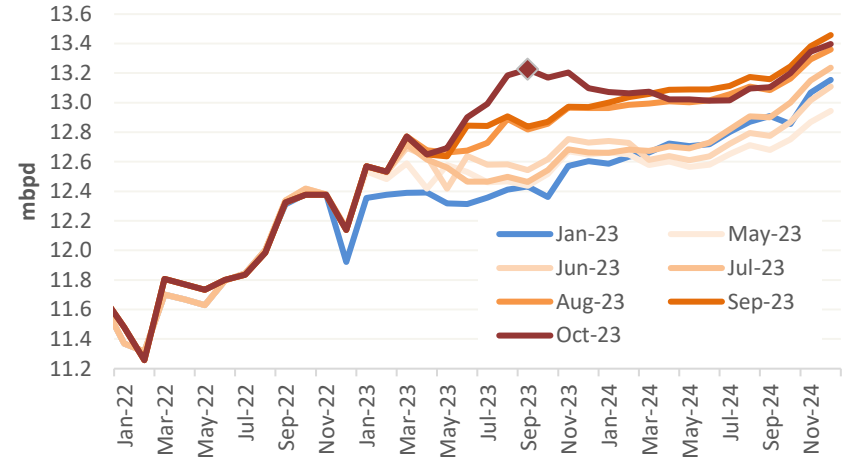
- Rigs counts saw their best week since last November
- Rig counts
 - Total oil rig counts: +4 to 501
 - Horizontal oil rig counts: +4 to 449
 - The Permian horizontal oil rig count: +1
 - The Canadian horizontal oil rig count saw a bit of life this week, +8 to 114, but still 26 below this week last year
- The US horizontal oil rig count is falling at a pace of -2.5 / week on a 4 wma basis.
 - This number has been negative for 45 of the last 46 weeks
- Frac spreads rose, +3 to 263
 - As earlier, this is still too high for the current rig count, as DUCs continue to fall.
 - To hold DUCs steady, the spread count must fall by 27

Summary Assessment

- The most interesting news this week was EIA revisions in both the STEO and PSR to US crude and condensate production.
- US crude and condensate (C+C) production has been revised up 400 kbpd in the October STEO.
 - This changes the production narrative, as it shows almost unbroken growth from Jan. 2022 to Sept. 2023, with growth averaging about 1 mbpd / year despite falling rigs counts since last December
- Since August 2022, a gap had appeared between US C+C production as reported in the weekly PSR and the monthly STEO (bottom graph).
 - As a result of this gap and upward revision per the monthly STEO, the weekly C+C numbers have been revised up 1 mbpd in the last two months, bringing the PSR and STEO C+C numbers back into alignment (red circle, bottom graph)
 - This is a very large revision, but sometimes that's how it goes. It does make the data harder to interpret.
- The latest STEO shows US C+C production peaking last month.
 - Given the strength of trend to that point, a near term decline would seem less likely
 - Therefore, an upward revision of Q4 C+C numbers seems quite plausible
 - On the whole, however, the EIA sees US production peaking, which seems probable given on-going declines in rig counts, but timing is uncertain.

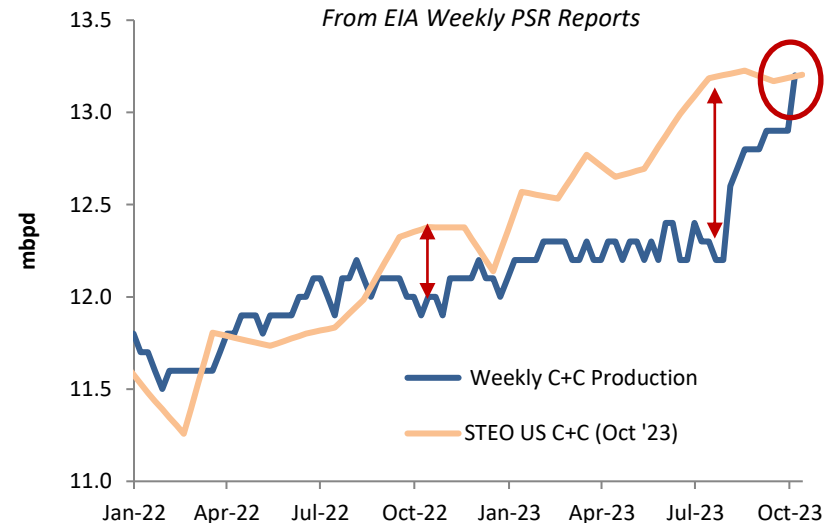
US Crude and Condensate Production

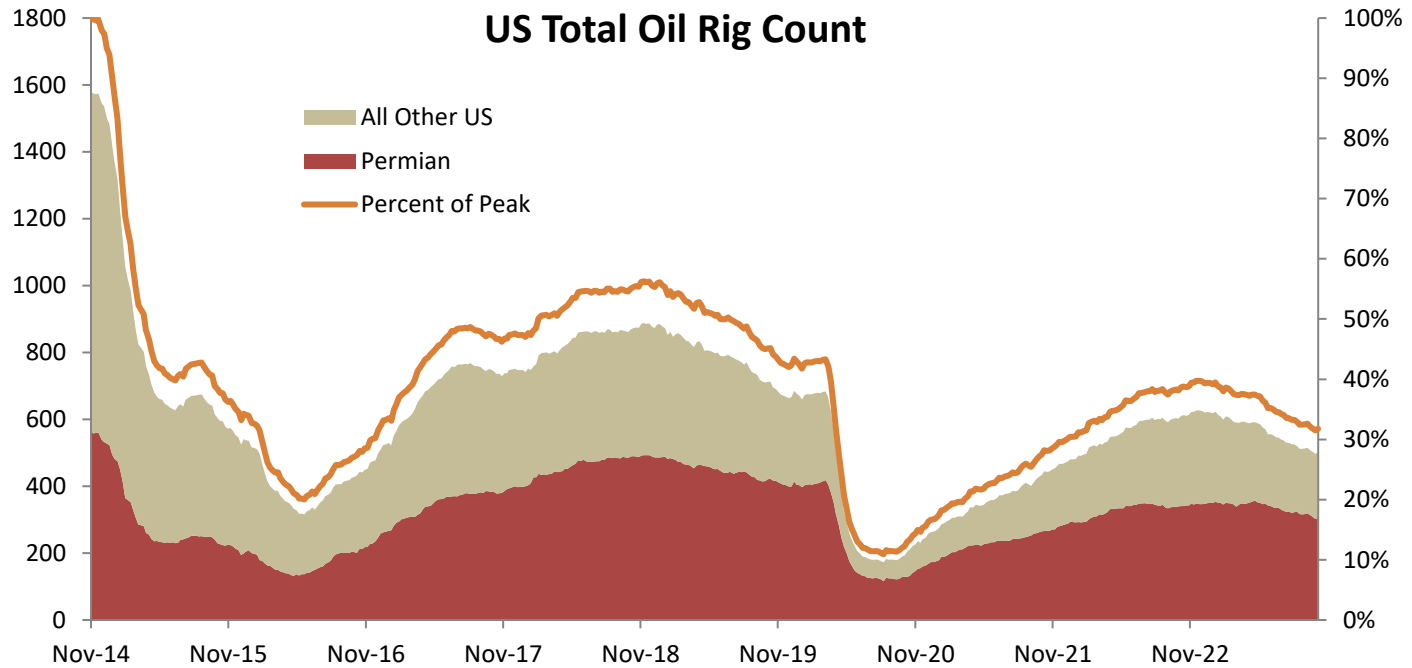
From EIA Monthly STEO Reports



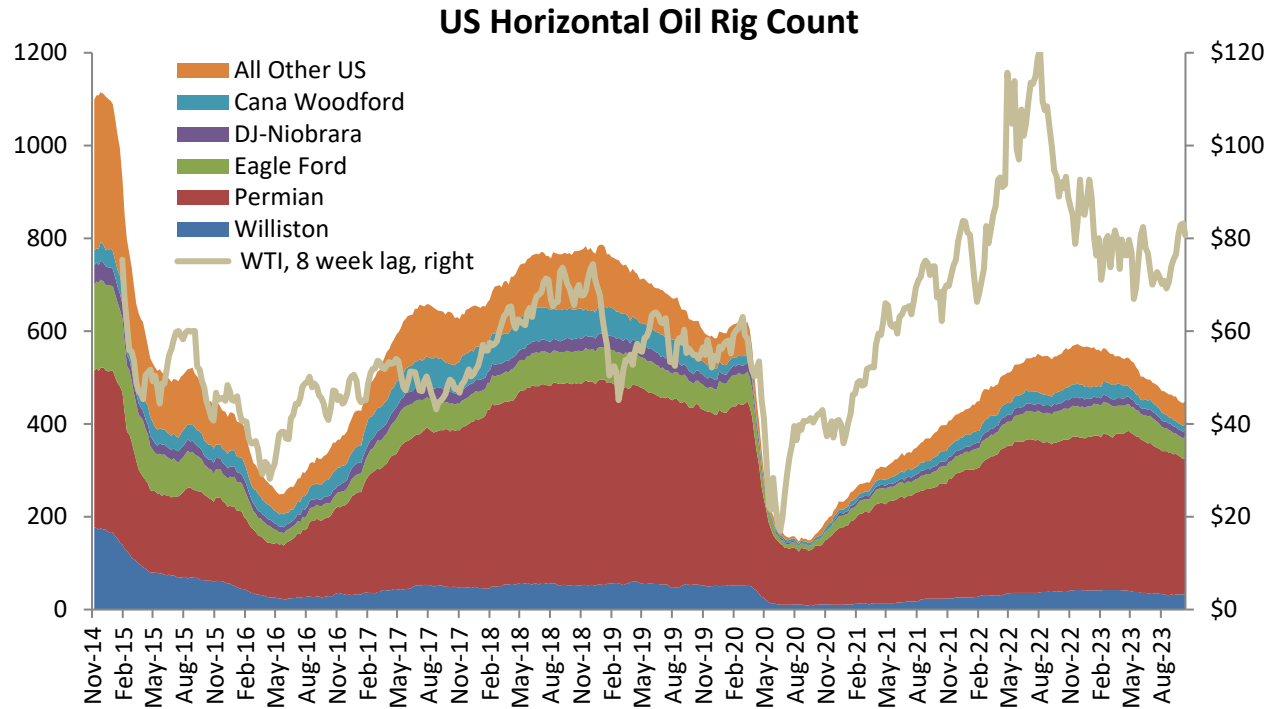
US Crude + Condensate Production

From EIA Weekly PSR Reports



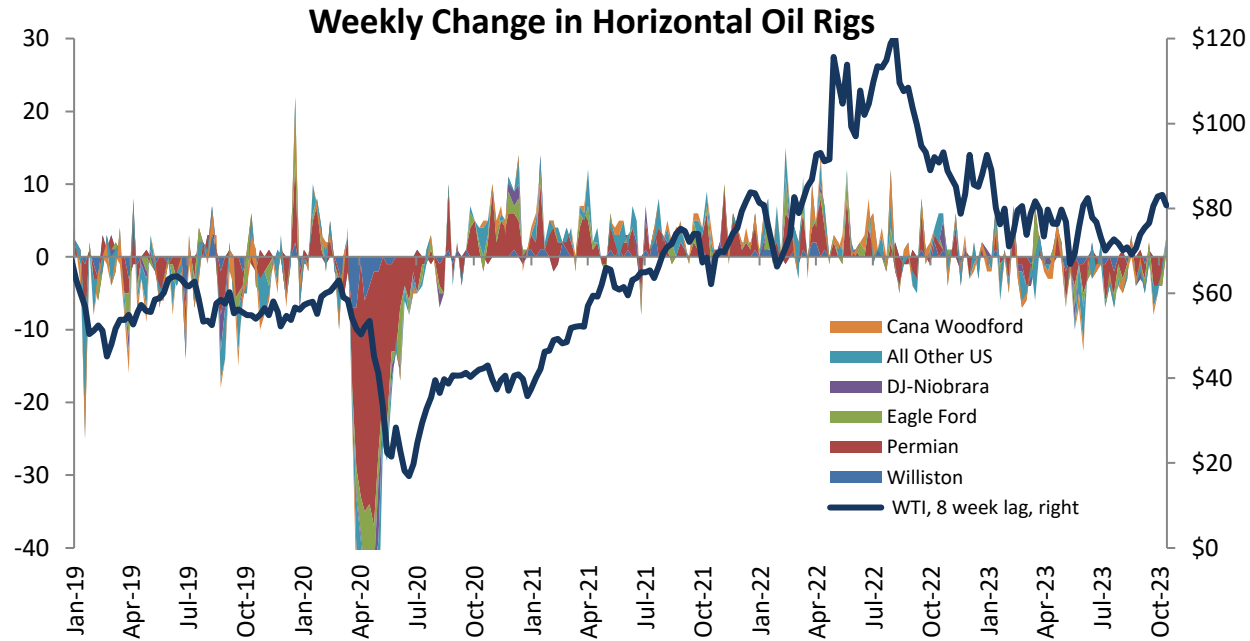


- Total oil rigs: +4 to 501
- Permian: +2
- All Other US: +2



- Horizontal oil rigs: +4 to 449
- Permian: +1
- All Other US: +3

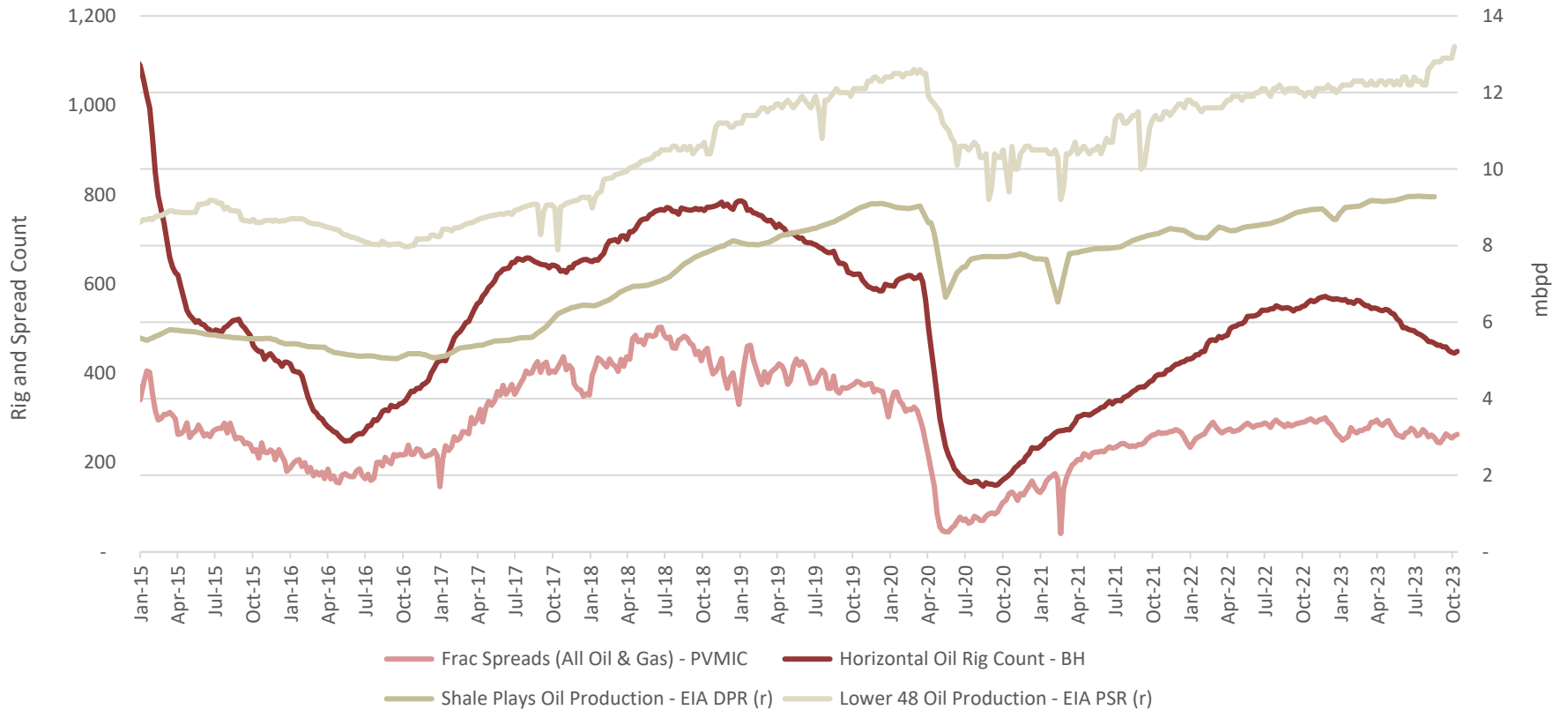
Weekly Change in Horizontal Oil Rig Count by Basin



• By Basin	Change	Count
- Williston	+1	33
- Permian	+1	293
- Eagle Ford	+2	47
- DJ Niobrara	0	14
- Cana Wdford	0	13
- Other US	0	49
- Total	+4	449

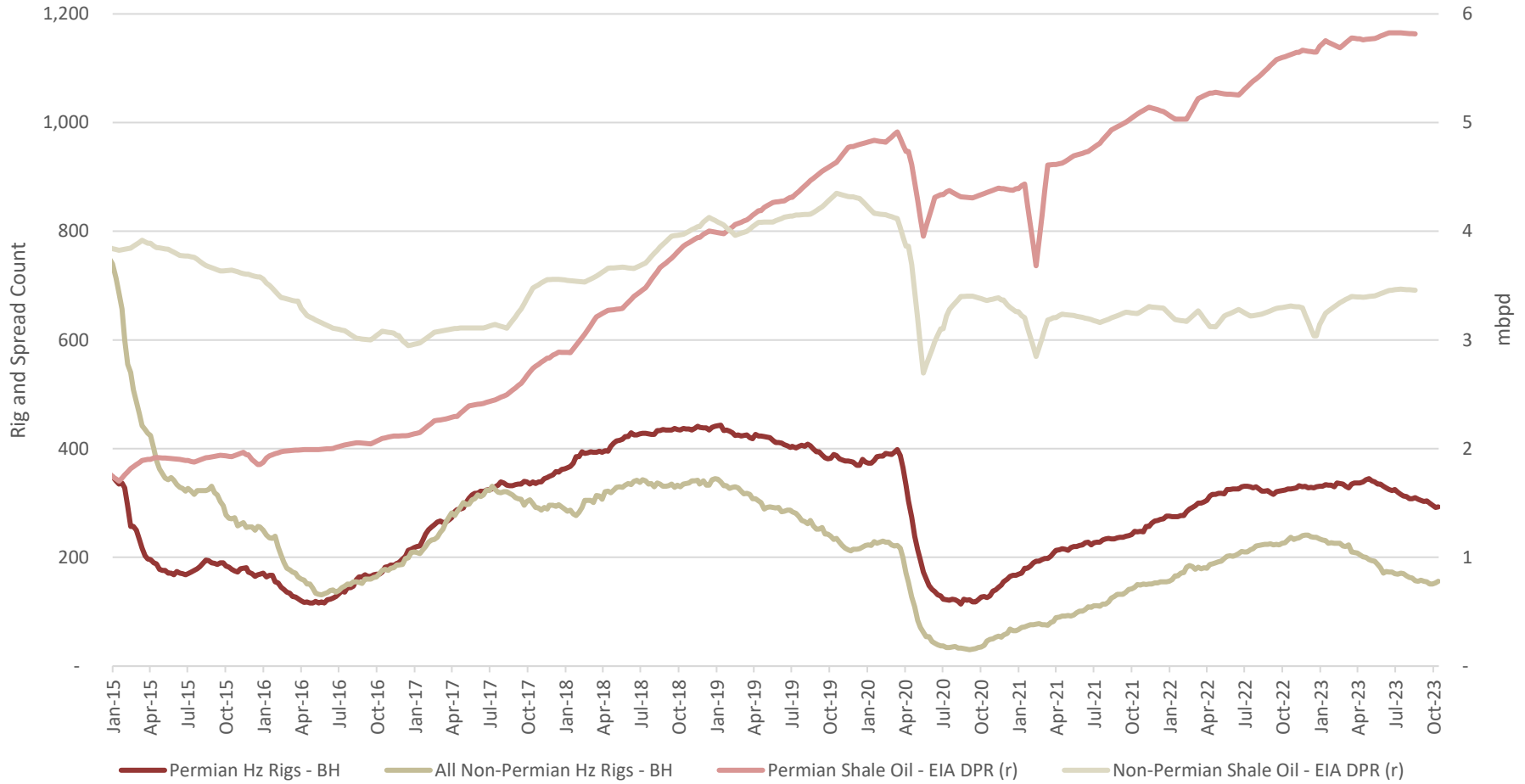
Rigs, Spreads and US Oil Production

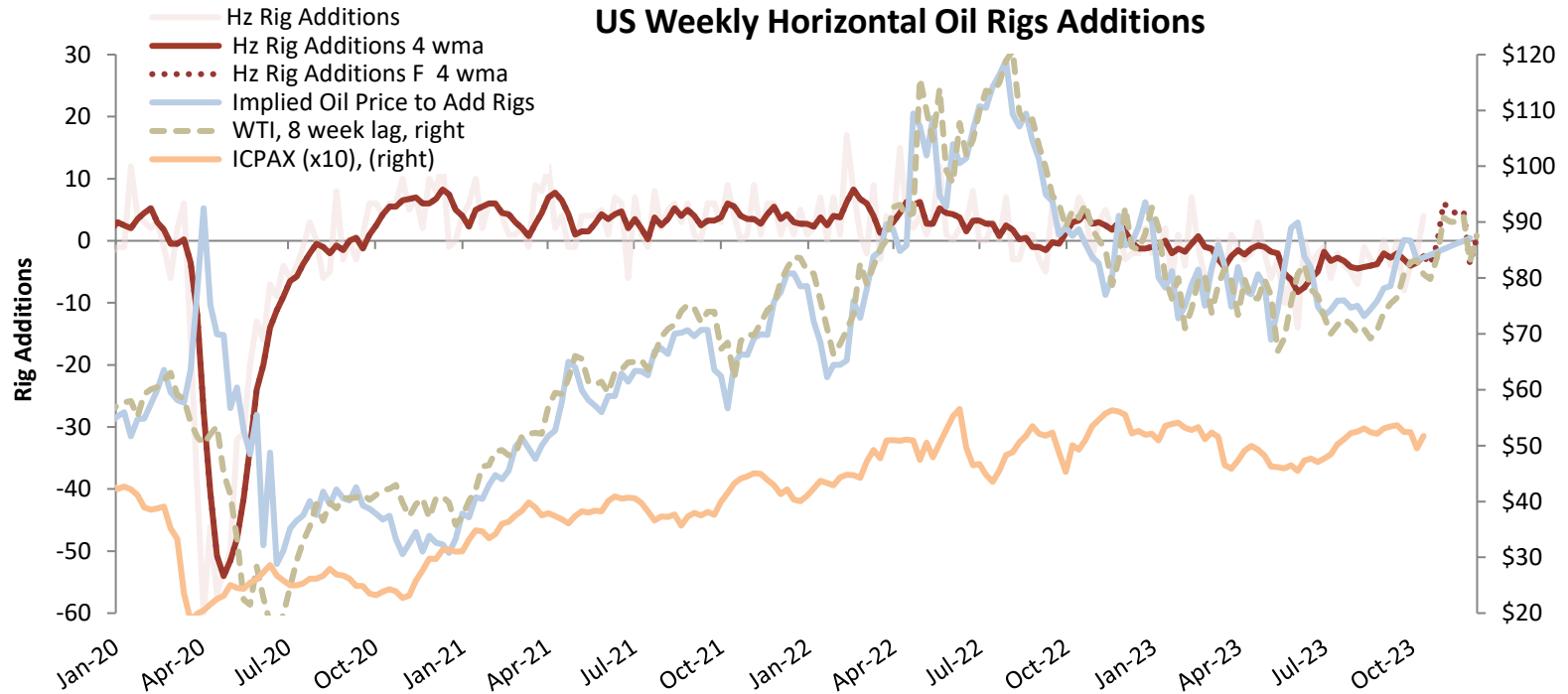
Rigs, Spreads and US Crude and Condensate Production



Permian & Non-Permian Shale Oil Production and Hz Oil Rigs

Permian and Non-Permian Shale Oil Production and Horizontal Rigs

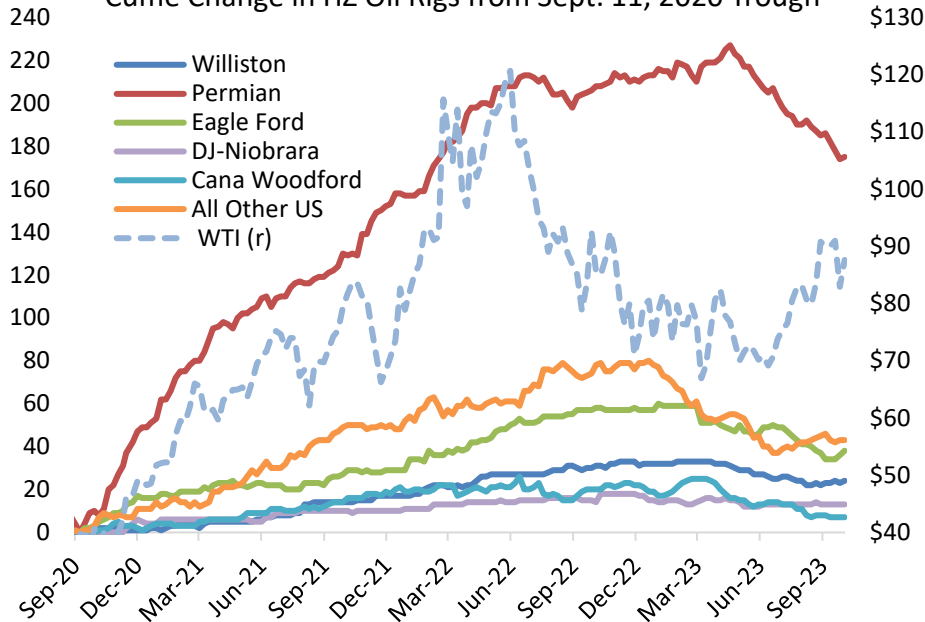




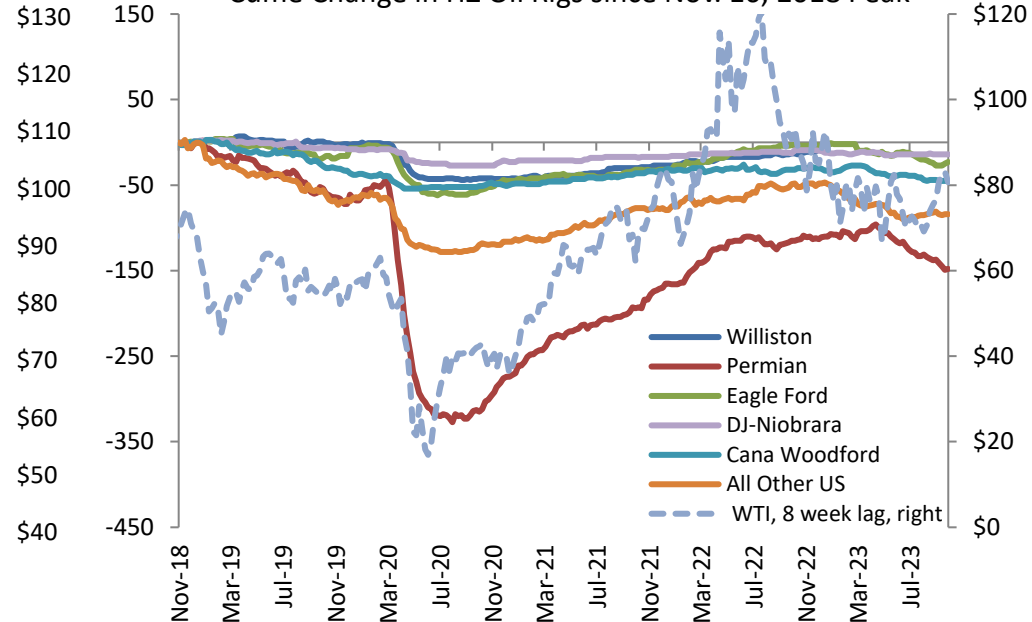
- The 4 wma pace of horizontal rig additions rose to -2.5 / week, negative for the 45th time in the last 46 weeks
- With an eight-week lag, the breakeven to add horizontal oil rigs fell to \$83 / barrel on a WTI basis with \$88 on the screen

US Horizontal Oil Rig Change from Peak and Trough

Cume Change in HZ Oil Rigs from Sept. 11, 2020 Trough

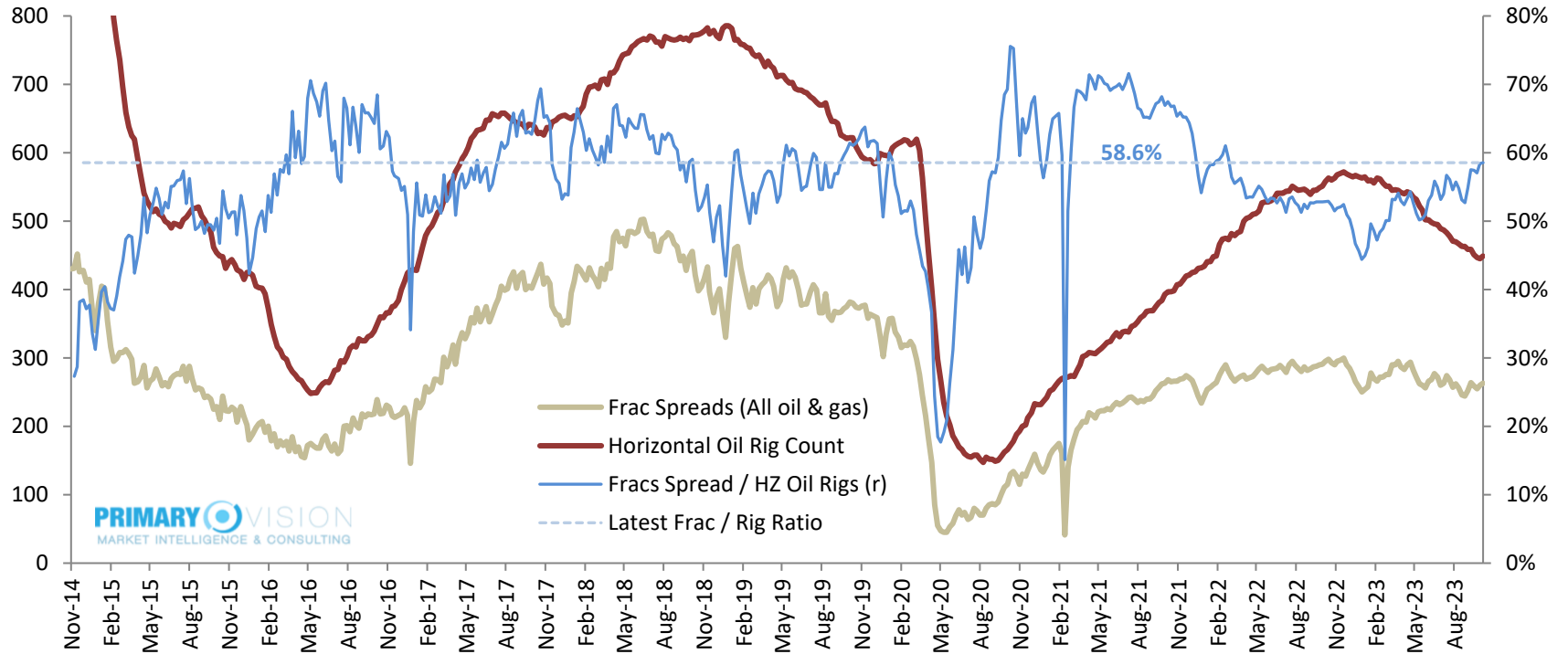


Cume Change in HZ Oil Rigs since Nov. 16, 2018 Peak



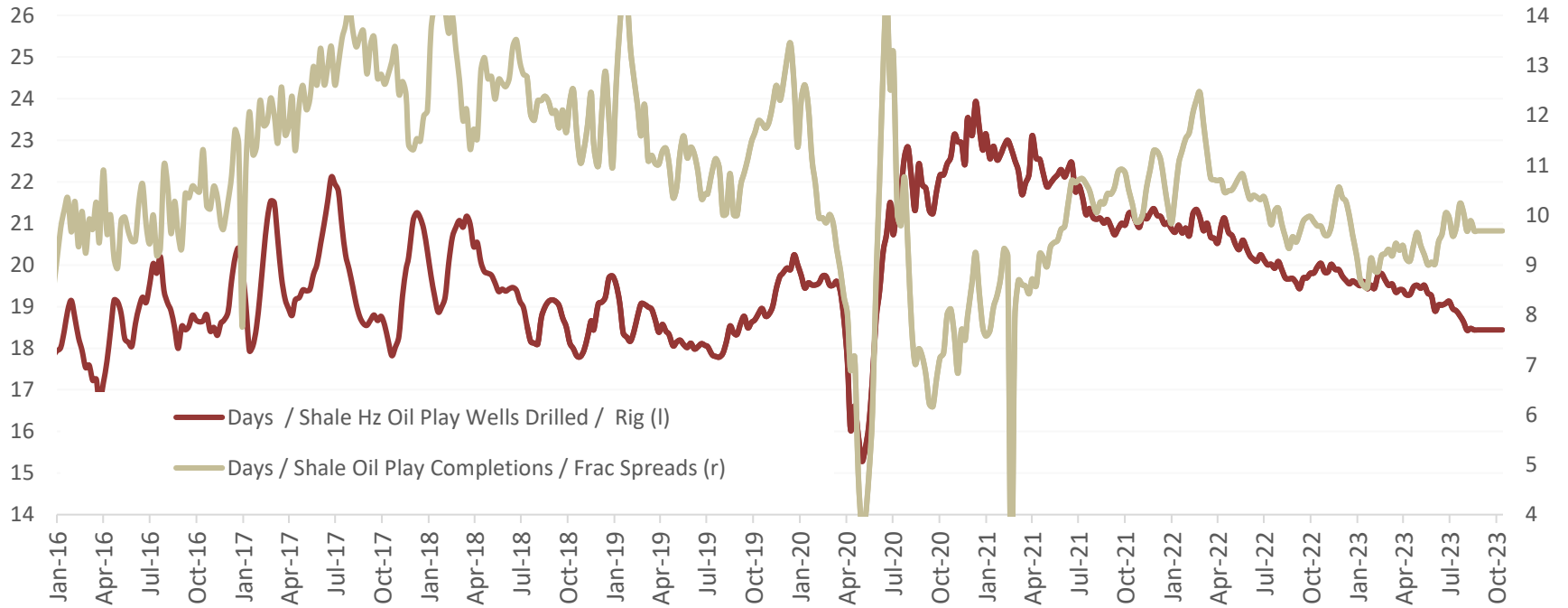
	Latest HZ Rig Count	Trough August 14, 2020				Prior Peak Nov. 16, 2018			
		Trough Count	Rig Change	Percent Change	Pct of Rig Gained	Peak Count	Rig Change	Percent Change	Pct of Rigs Lost
- Williston	33	11	22	200%	7%	53	(20)	-38%	6%
- Permian	293	114	179	157%	59%	441	(148)	-34%	44%
- Eagle Ford	47	10	37	370%	12%	70	(23)	-33%	7%
- DJ Niobrara	14	1	13	1300%	4%	28	(14)	-50%	4%
- Cana Wdford	13	6	7	117%	2%	58	(45)	-78%	13%
- Other US	49	5	44	880%	15%	133	(84)	-63%	25%
- Total	449	147	302	205%	100%	783	(334)	-43%	100%
		<i>05/22/20</i>							
- Frac Spreads	263	45	218	484%		433	(170)	-39%	
<i>Spread Ratio</i>	<i>58.6%</i>	<i>30.6%</i>				<i>55.3%</i>			

Frac Spreads and Horizontal Oil Rigs



- Frac spreads were +3 to 263

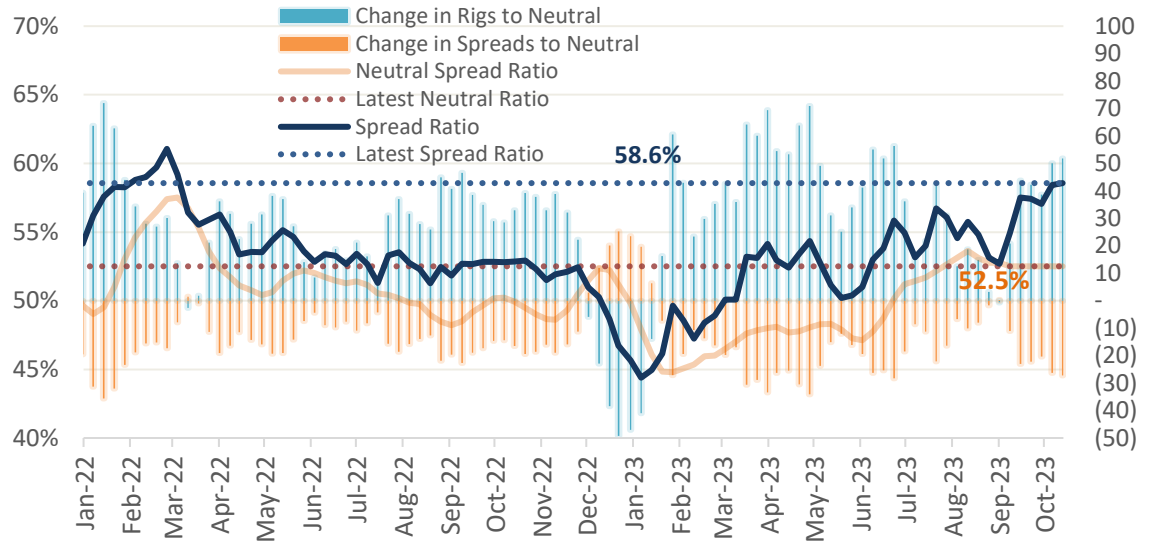
Productivity of Rigs and Spreads: Days per Well



Rig and Spread Productivity

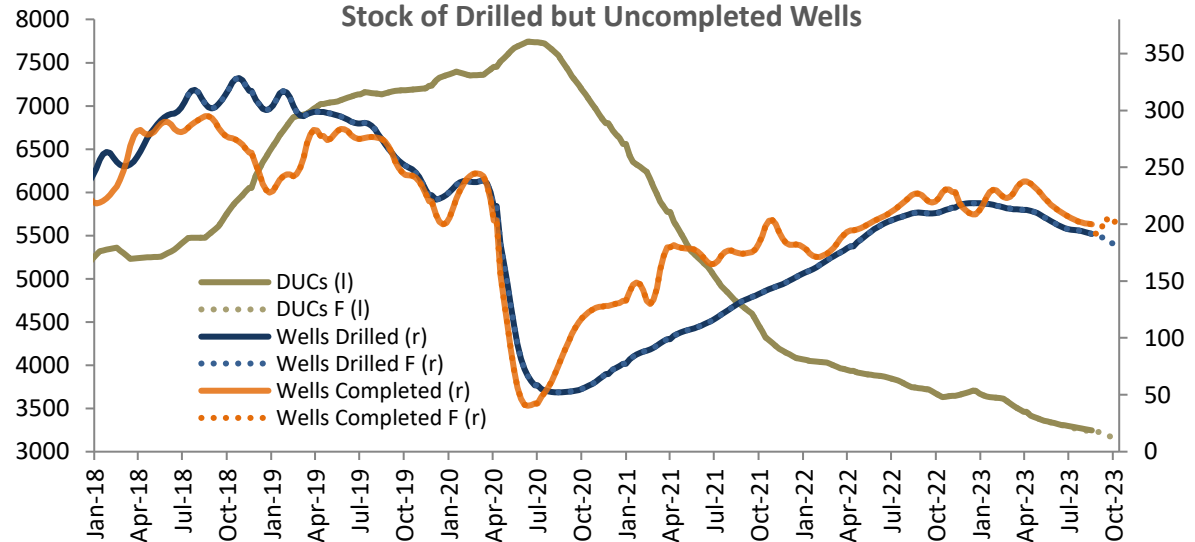
- At estimated productivity levels and current rig and spread counts, the DUC inventory is declining

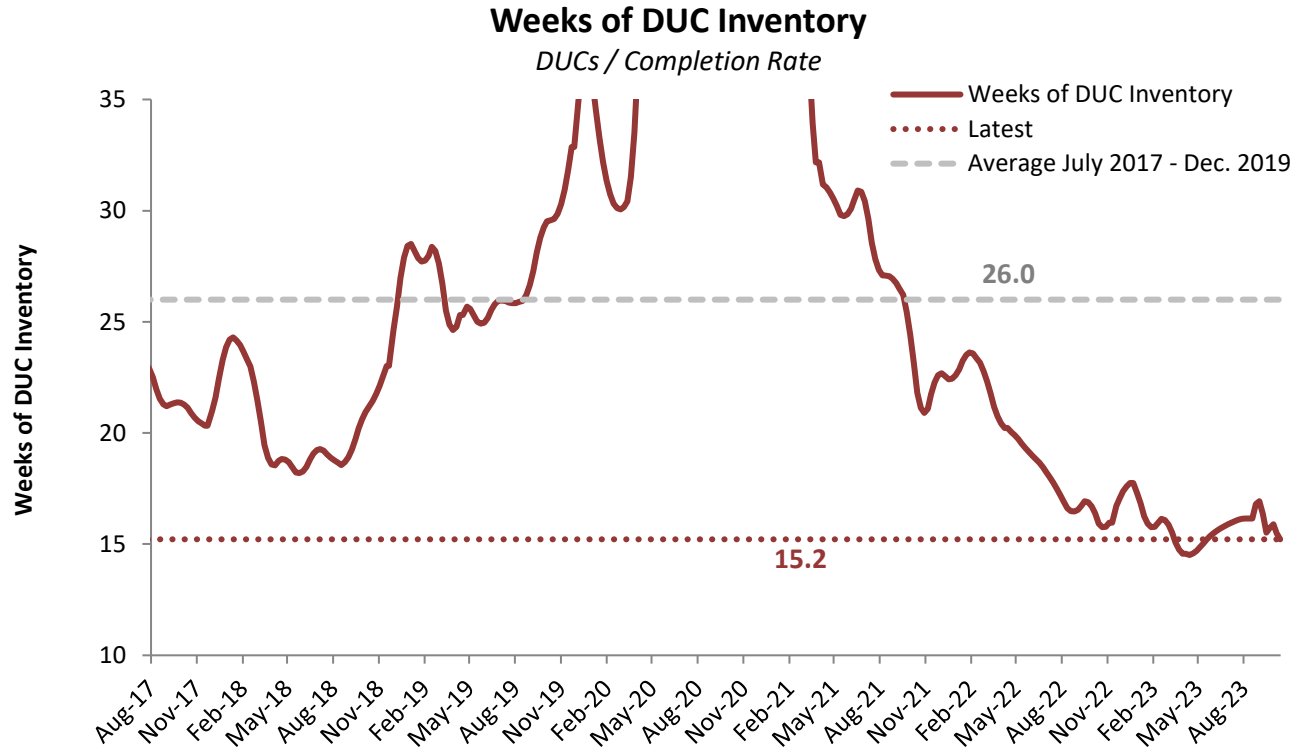
The Spread Ratio and Rigs and Spreads for DUC Neutrality



Horizontal Oil Wells Drilled and Completed per Week

Stock of Drilled but Uncompleted Wells

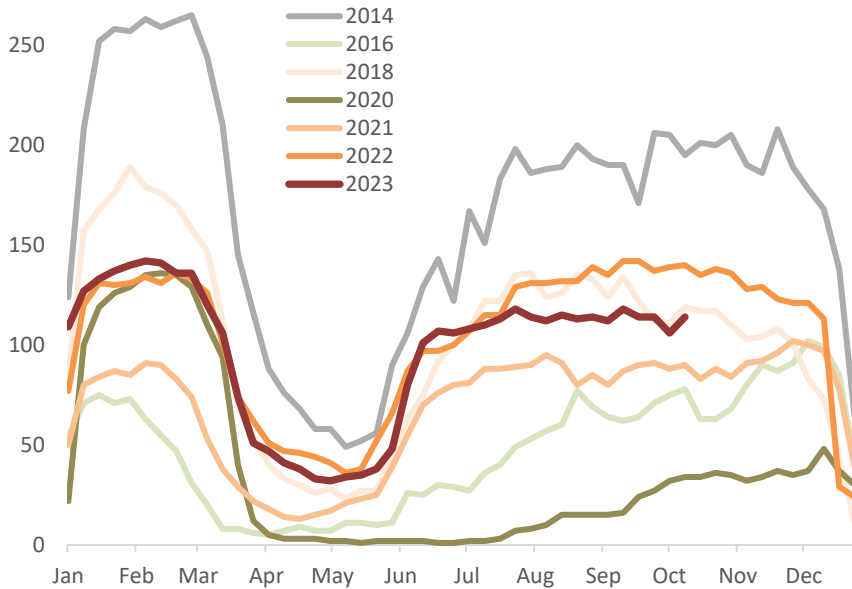




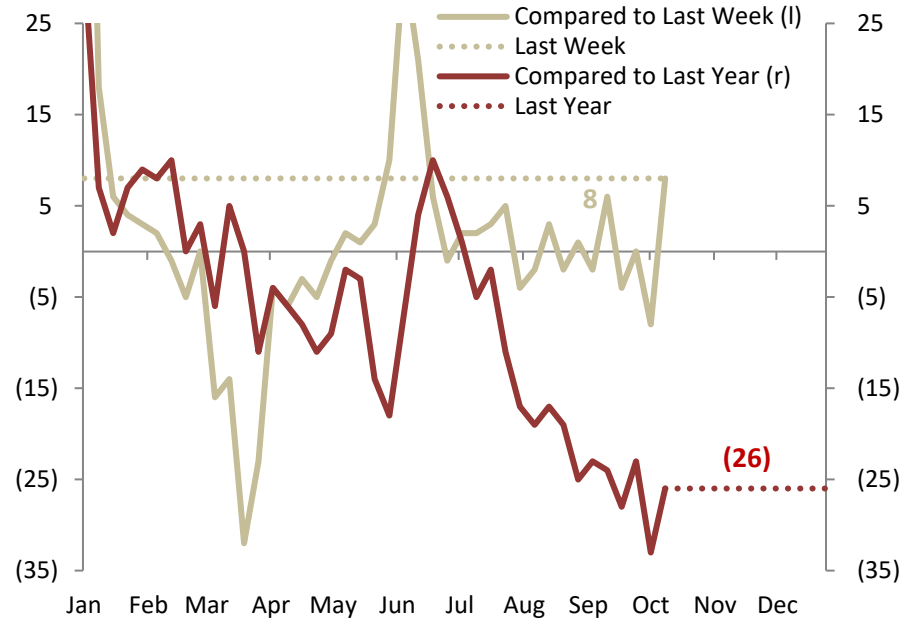
- DUC inventories have fallen back to 15.2 weeks

Canada Horizontal Oil Rig Count

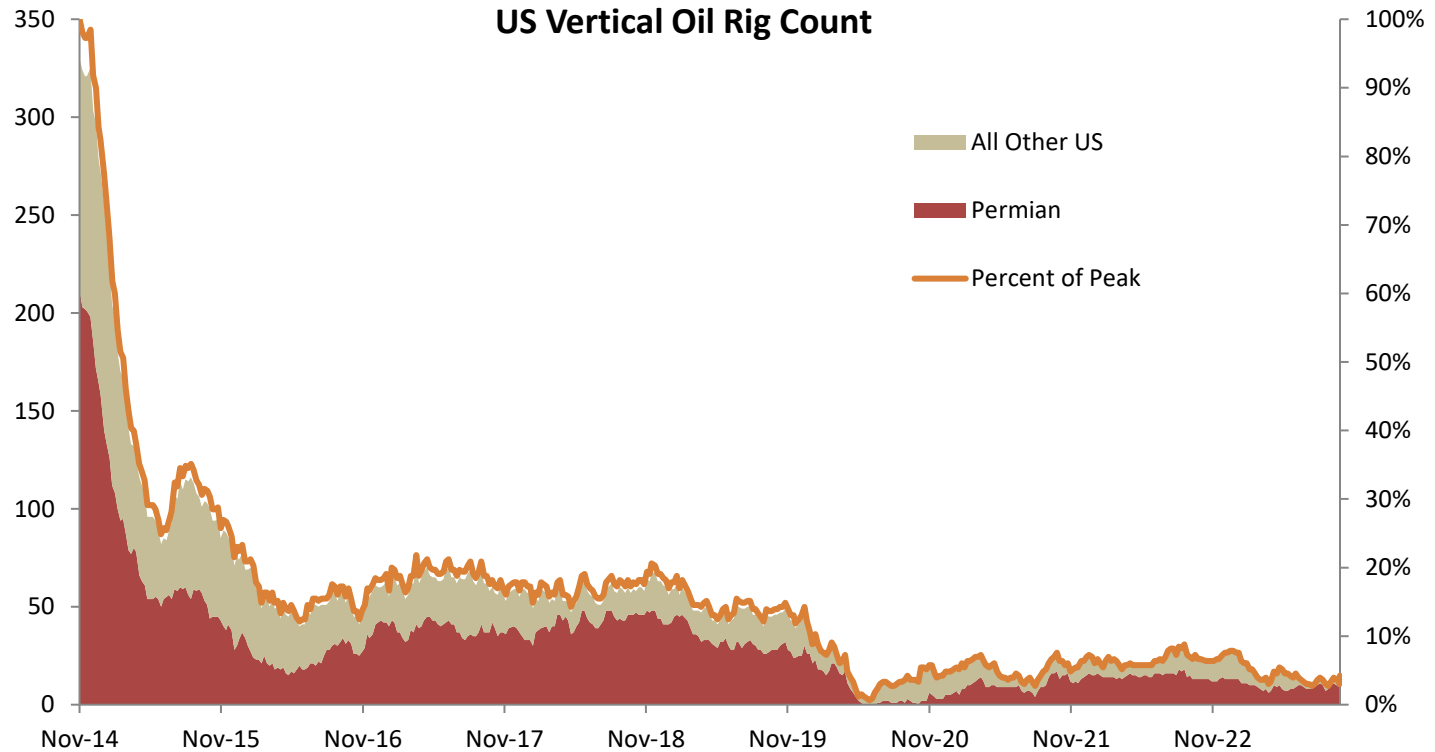
Canada Horizontal Oil Rigs



Compared to Previous Week, Previous Year

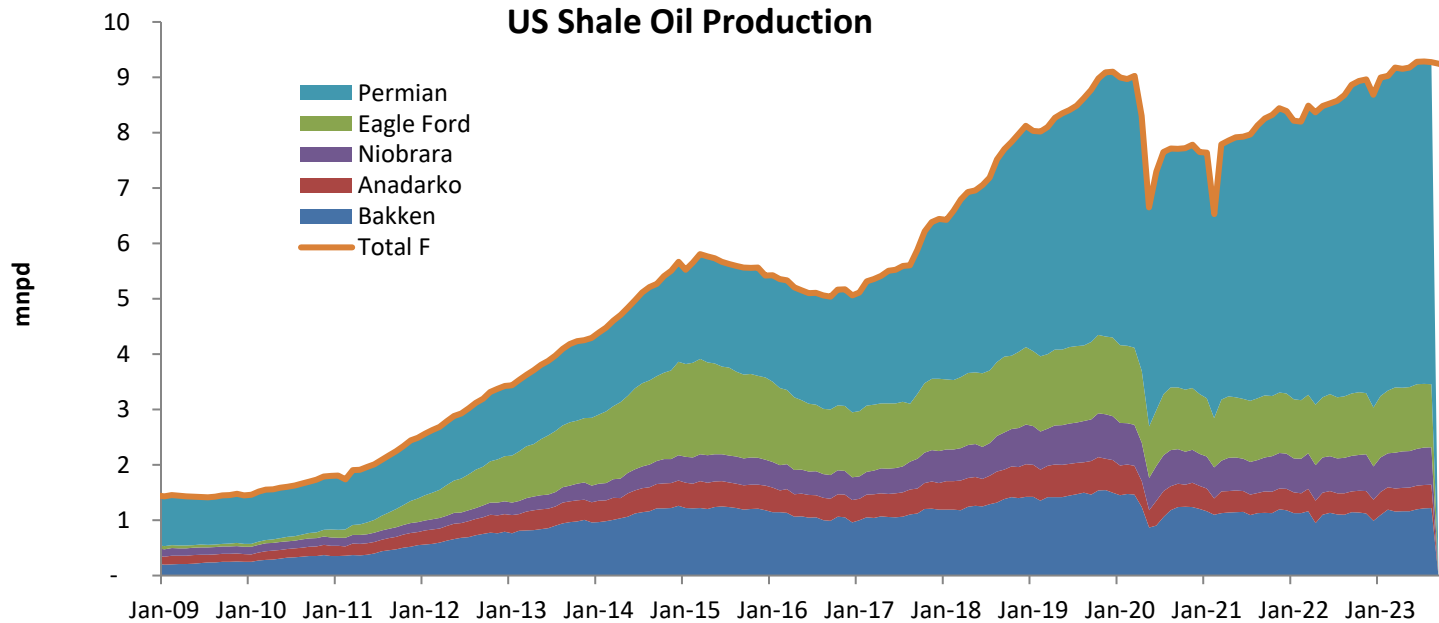


- Canada horizontal oil rigs were +8 to 114 last week
- Rigs counts were -26 compared to the same week last year



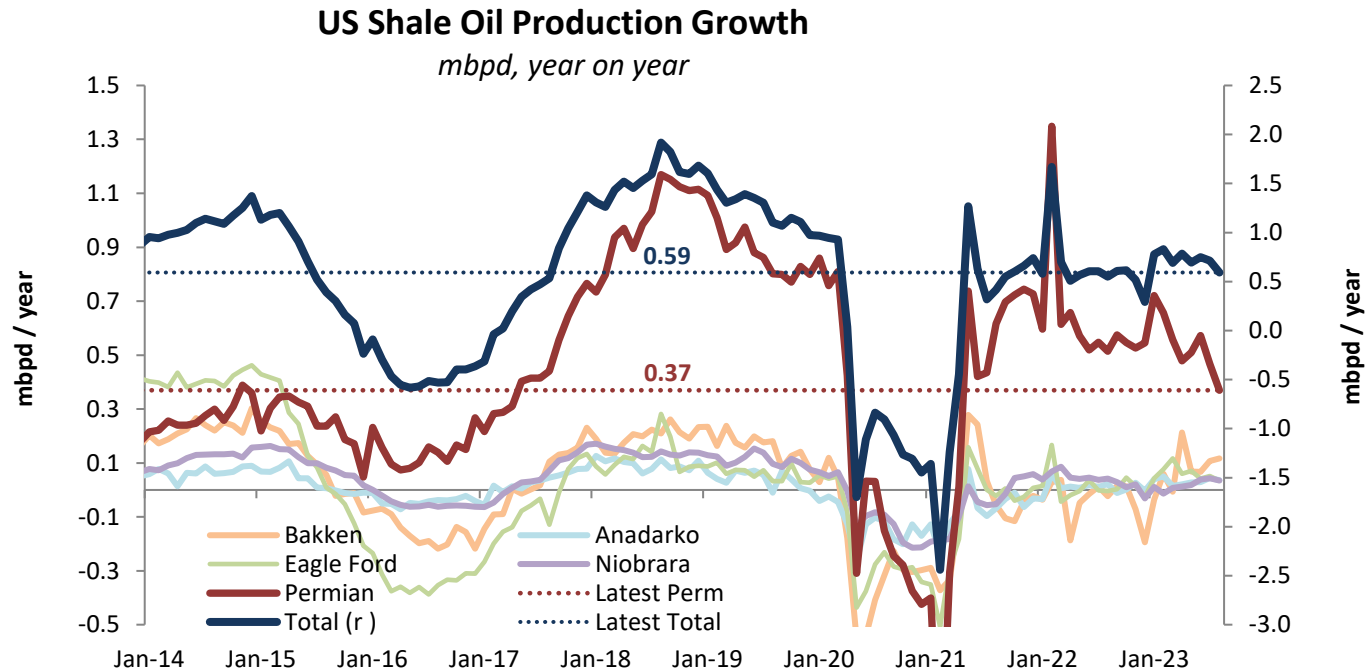
- Vertical oil rigs: +4 to 14
- Permian: +1
- All Other US: +3

US Shale Production Growth (Sept. DPR)



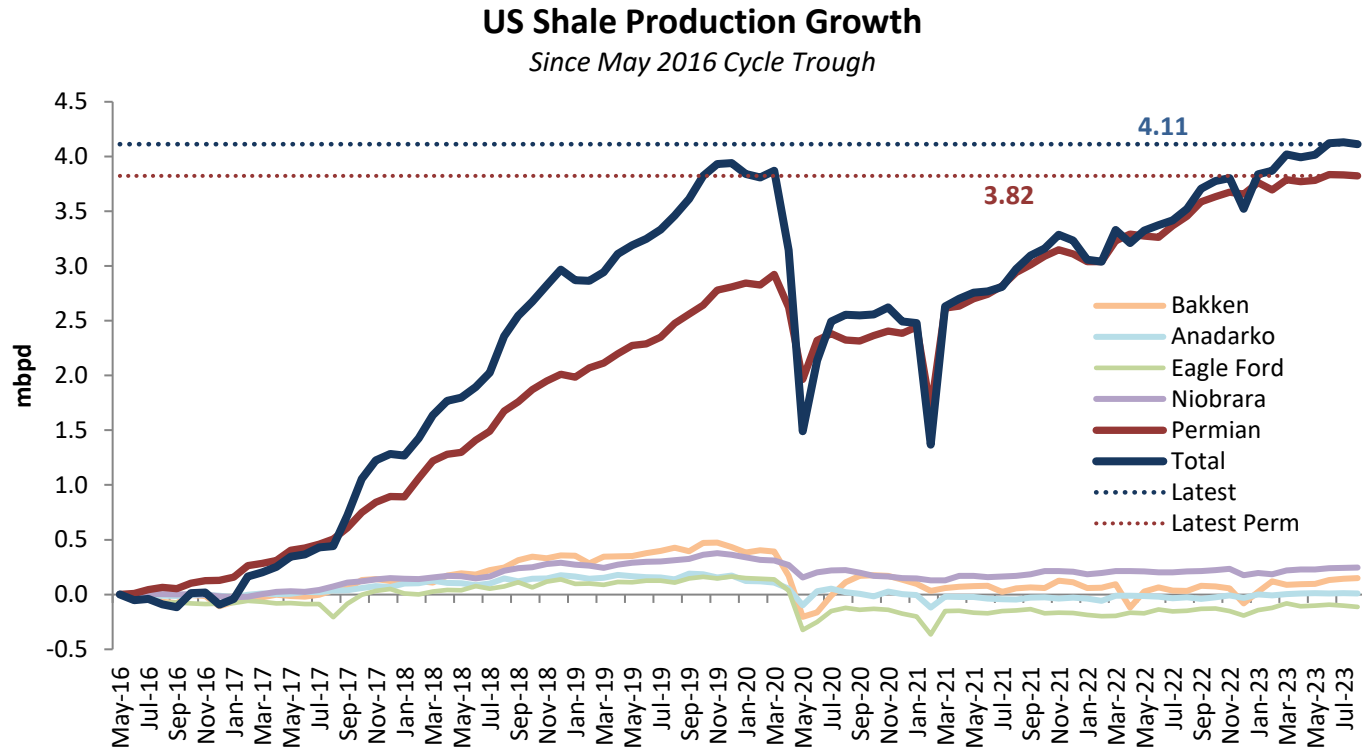
- In the September DPR report, August crude and condensate production from key shale plays rose to 9.73 mbpd, down 17 kbpd from July. However, total July C+C production was revised up 36 kbpd from 9.25 mbpd
- Permian production again fell in August, down a 9 kbpd over July
- The minor plays are down marginally over the period
- The EIA is forecasting Oct. C+C production down 82 kbpd from its July peak for the key US shale plays

US Shale Production Growth (Sept. DPR)



- Compared to last year, total shale oil production is up 0.6 mbpd
- The Permian is up 0.4 mbpd
- Annual Permian growth is rapidly decelerating

US Shale Production Growth from May '16 (Sept. DPR)



- Since the prior cyclical trough in May 2016, total shale oil production from the key plays is up 4.1 mbpd
- All but 290,000 bpd of this growth comes from the Permian basin

