

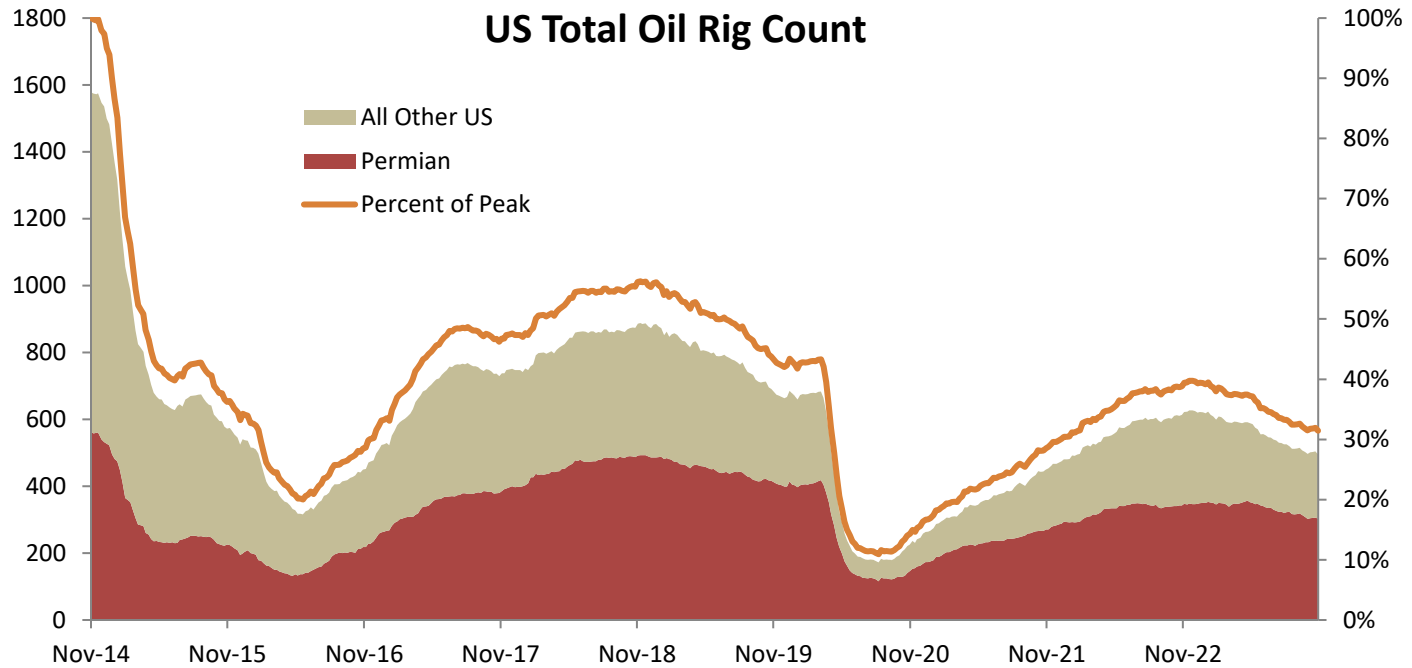
Baker Hughes Oil Rig and Primary Vision Frac Spread Counts

3 November 2023

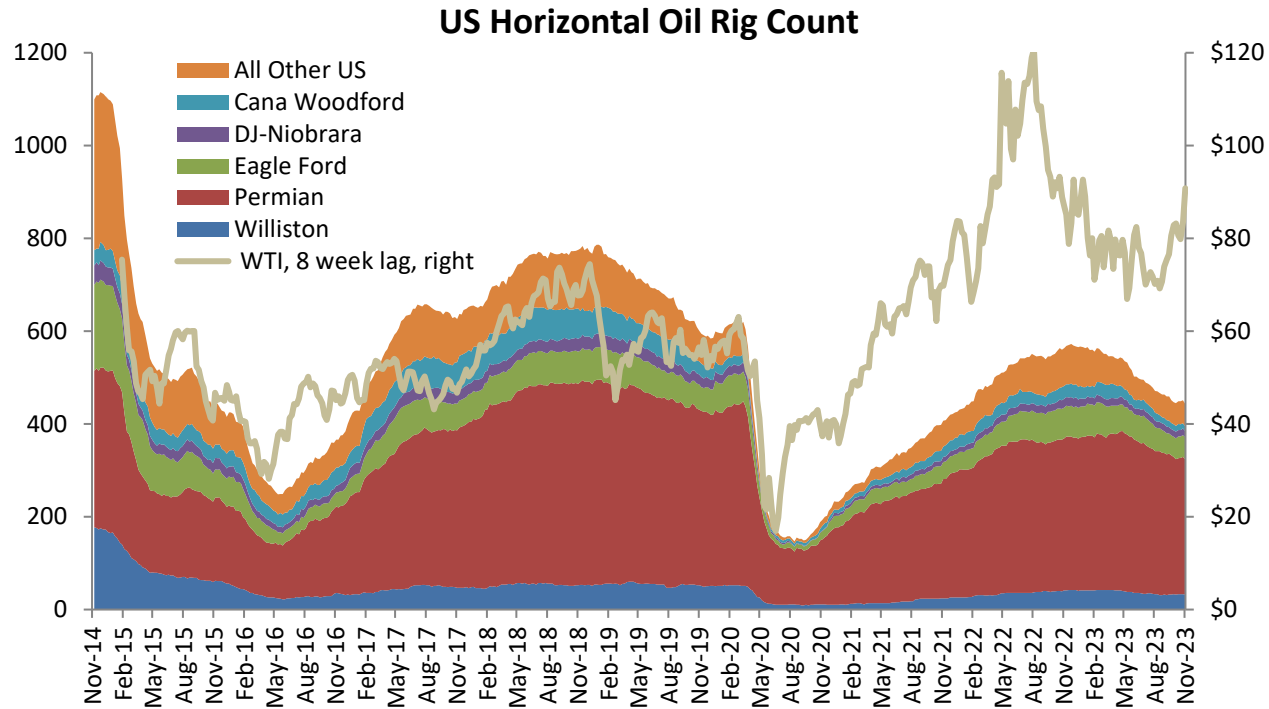
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- Rig counts have resumed their decline, giving back all their gains of the last few weeks
- Rig counts
 - Total oil rig counts: -8 to 496
 - Horizontal oil rig counts: -8 to 443
 - The Permian horizontal oil rig count: -4
 - The Canadian horizontal oil rig count saw progress this week, +1 to 120, but still is 16 below this week last year
- The US horizontal oil rig count is falling at a pace of -0.5 / week on a 4 wma basis.
 - This number has been negative for 46 of the last 48 weeks
- Frac spreads fell, -5 to 270
 - As last week, there is a stark mismatch between rigs and spreads, with DUC inventory, as measured in days of turnover, falling to a nine-year low of 13.6 weeks
- The rig / spread relationship remains highly unstable
 - To attain stability in the DUC count, rigs must either rise by 83 or spreads must fall by 42.
 - Given that rig counts are falling at an implied WTI price above \$90 / barrel, a rapid roll-off of spreads seems likely at some point
- Interestingly, the Brent Spread (Brent – WTI) opened back up to \$4+ / barrel in the last two weeks
 - An open spread has implied US production growing faster than Brent zone production, compelling US operators to offer a modest discount to place incremental barrels in the market
 - Historically, this spread is associated with US production growth around 400 – 600 kbpd / year
 - If that remains true, then EIA pessimism on US short-term C+C growth is misplaced

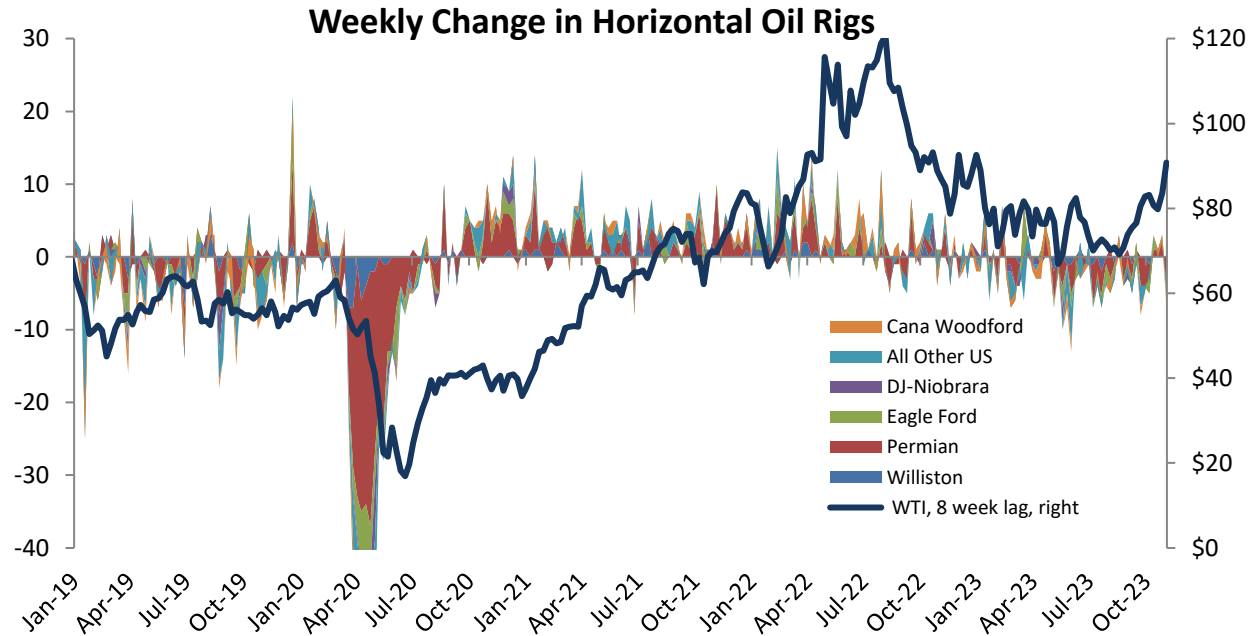


- Total oil rigs: -8 to 496
- Permian: -3
- All Other US: -5



- Horizontal oil rigs: -8 to 443
- Permian: -4
- All Other US: -4

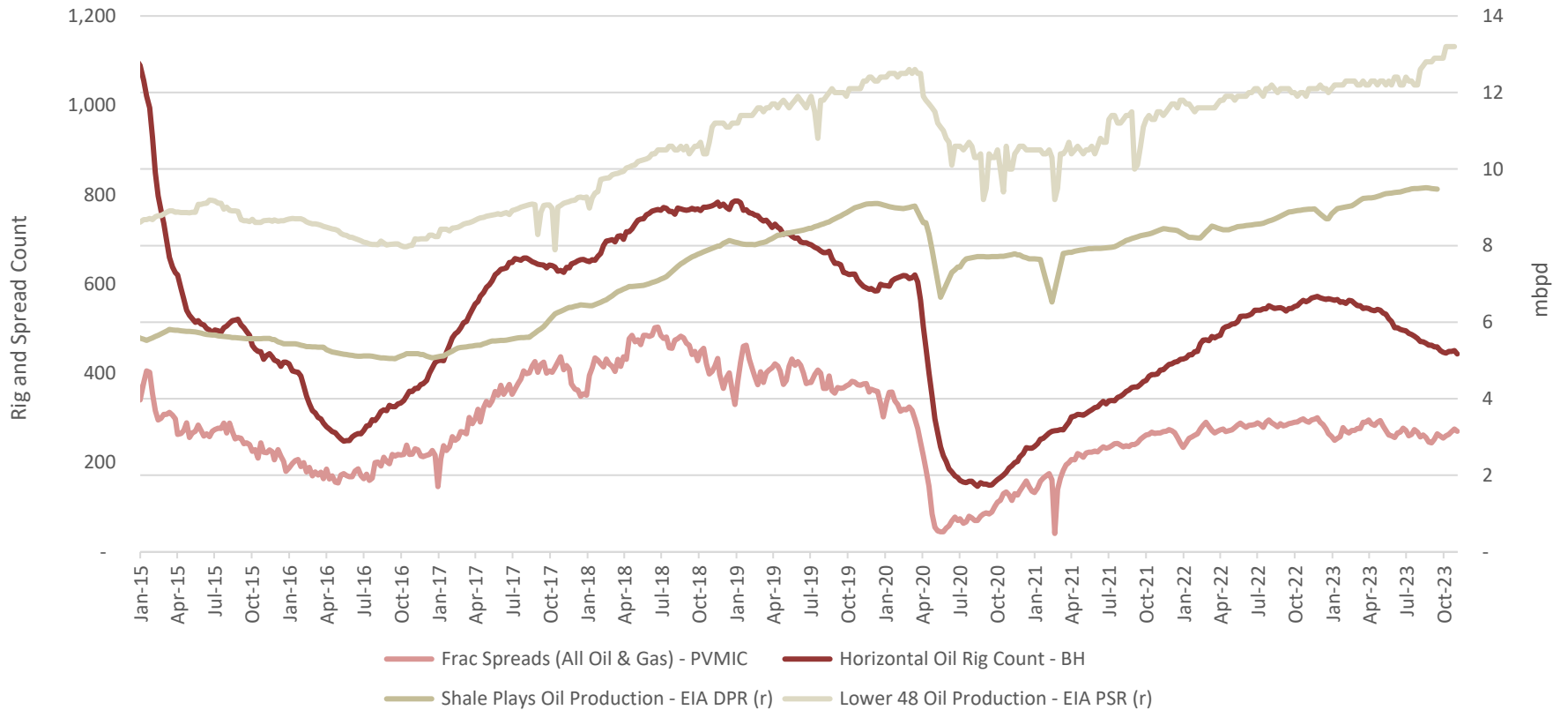
Weekly Change in Horizontal Oil Rig Count by Basin



• By Basin	Change	Count
- Williston	-1	32
- Permian	-4	292
- Eagle Ford	0	47
- DJ Niobrara	0	14
- Cana Wdford	-1	10
- Other US	-2	48
- Total	-8	443

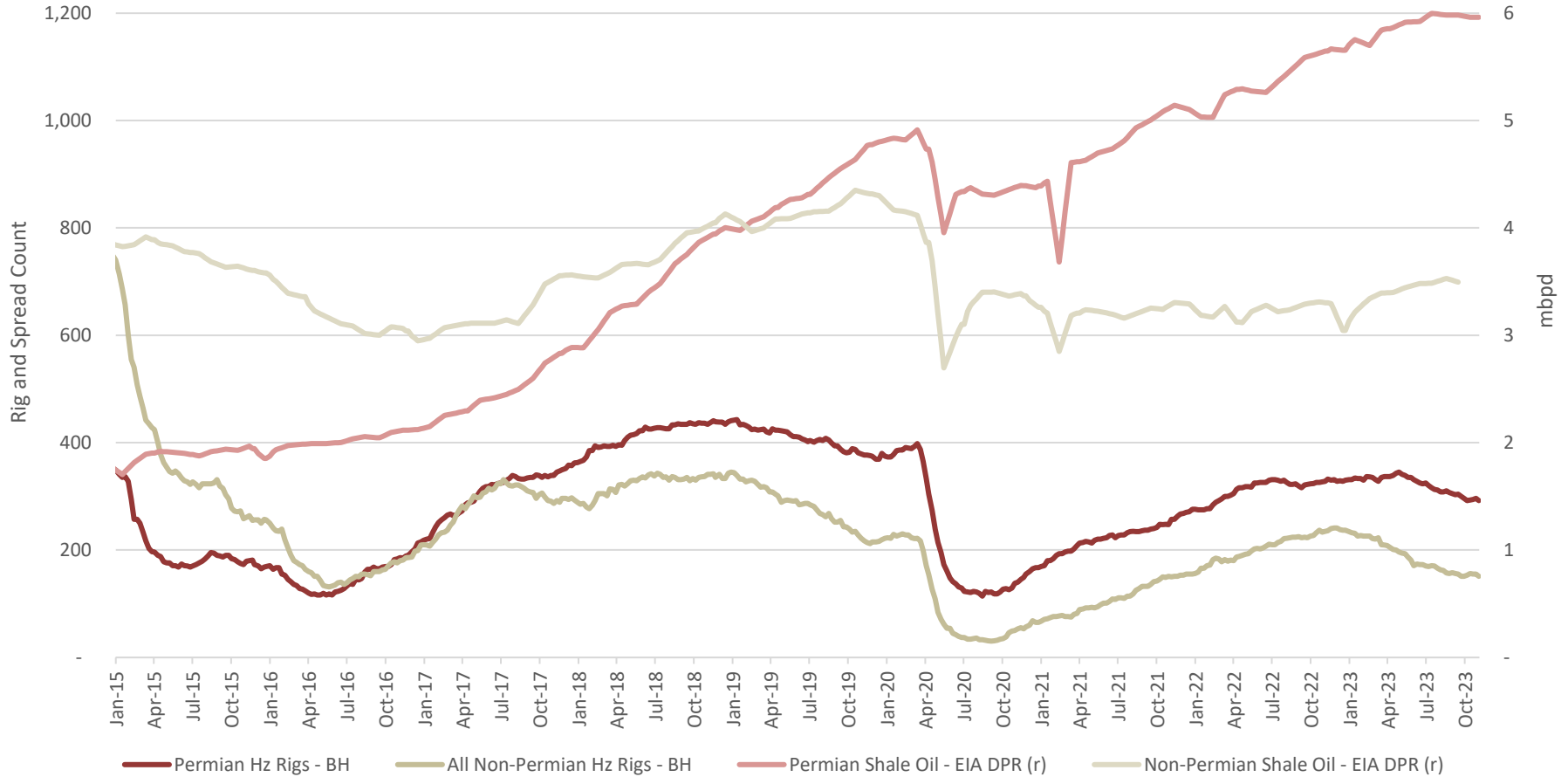
Rigs, Spreads and US Oil Production

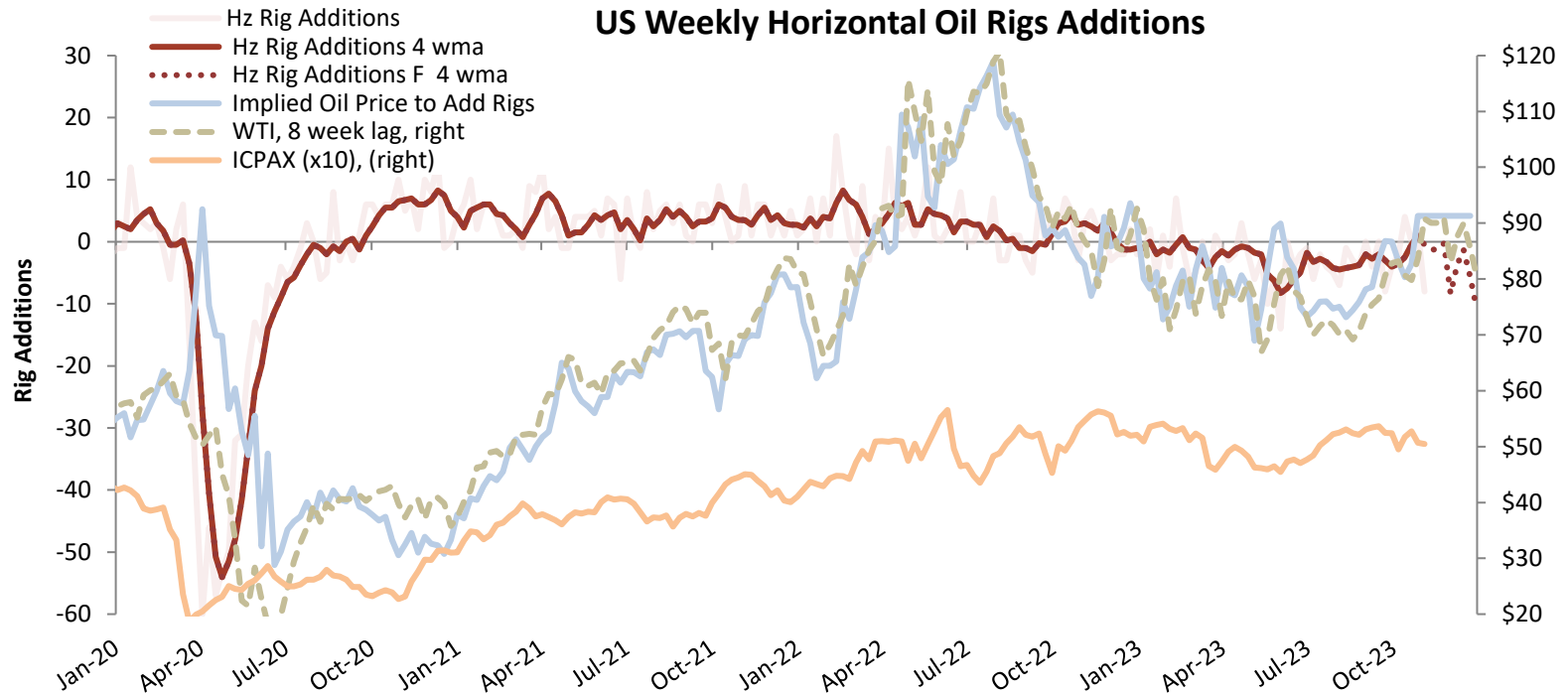
Rigs, Spreads and US Crude and Condensate Production



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

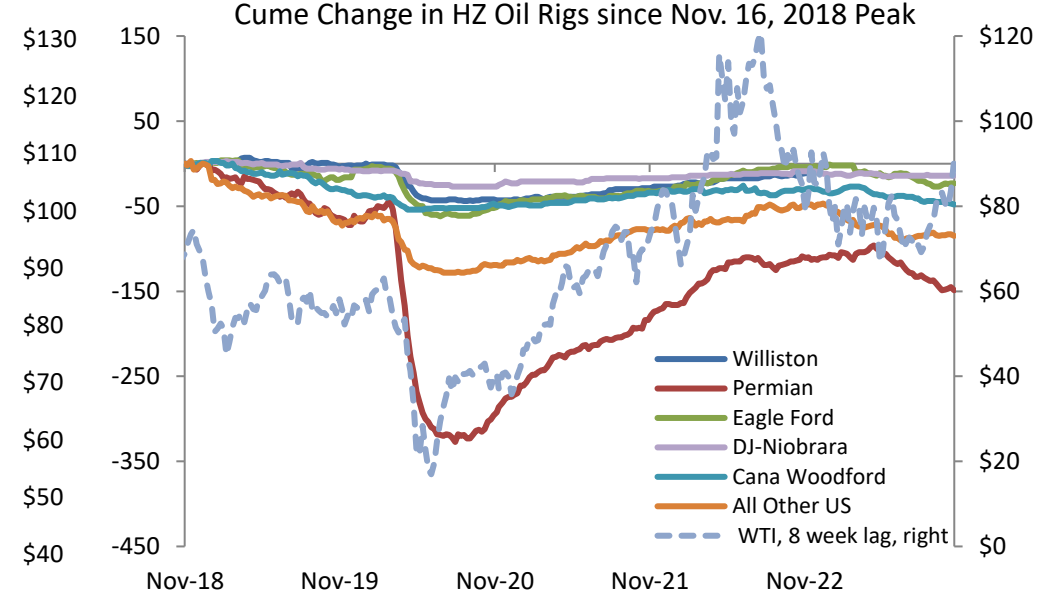
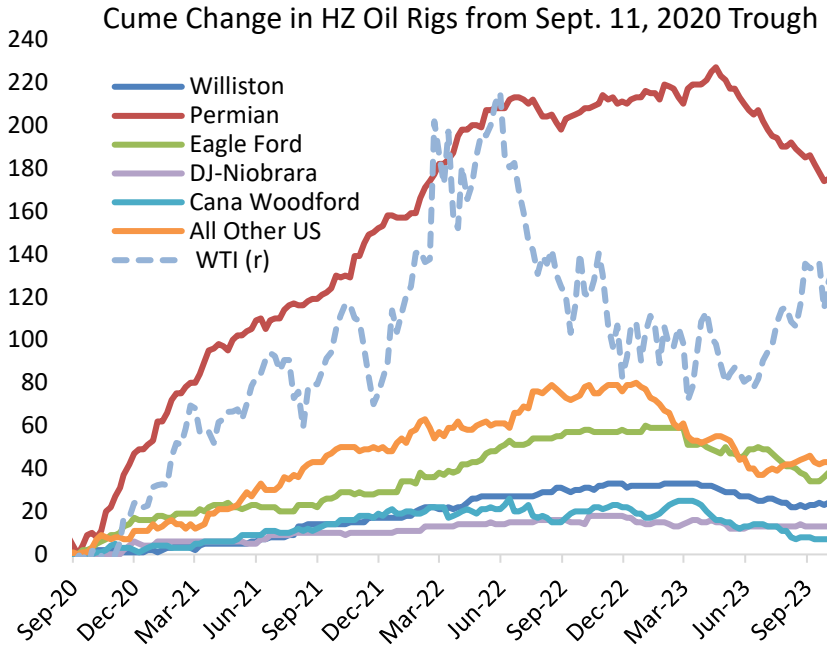
Permian and Non-Permian Shale Oil Production and Horizontal Rigs





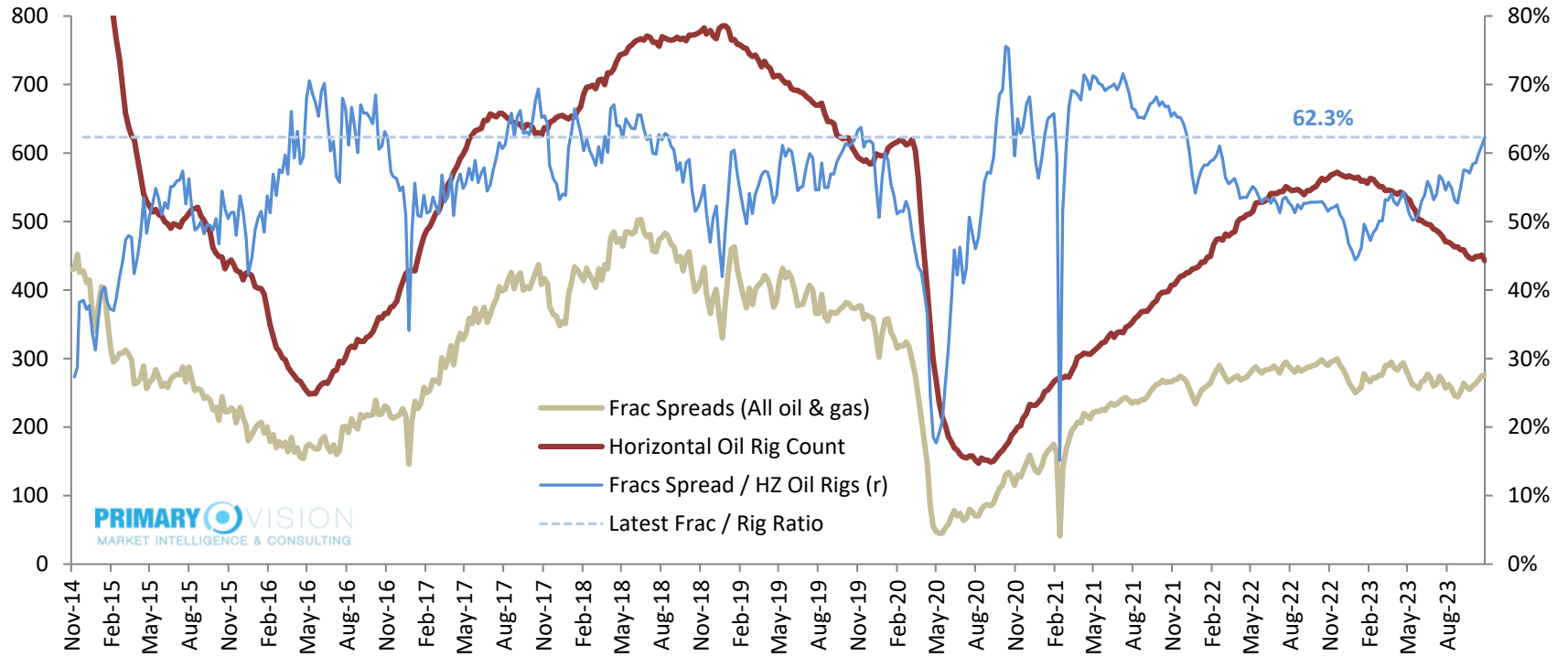
- The 4 wma pace of horizontal rig additions fell to -0.5 / week, negative for the 46th time in 48 weeks
- With an eight-week lag, the breakeven to add horizontal oil rigs stands at a horrific WTI \$91 / barrel with \$81 on the screen at writing

US Horizontal Oil Rig Change from Peak and Trough



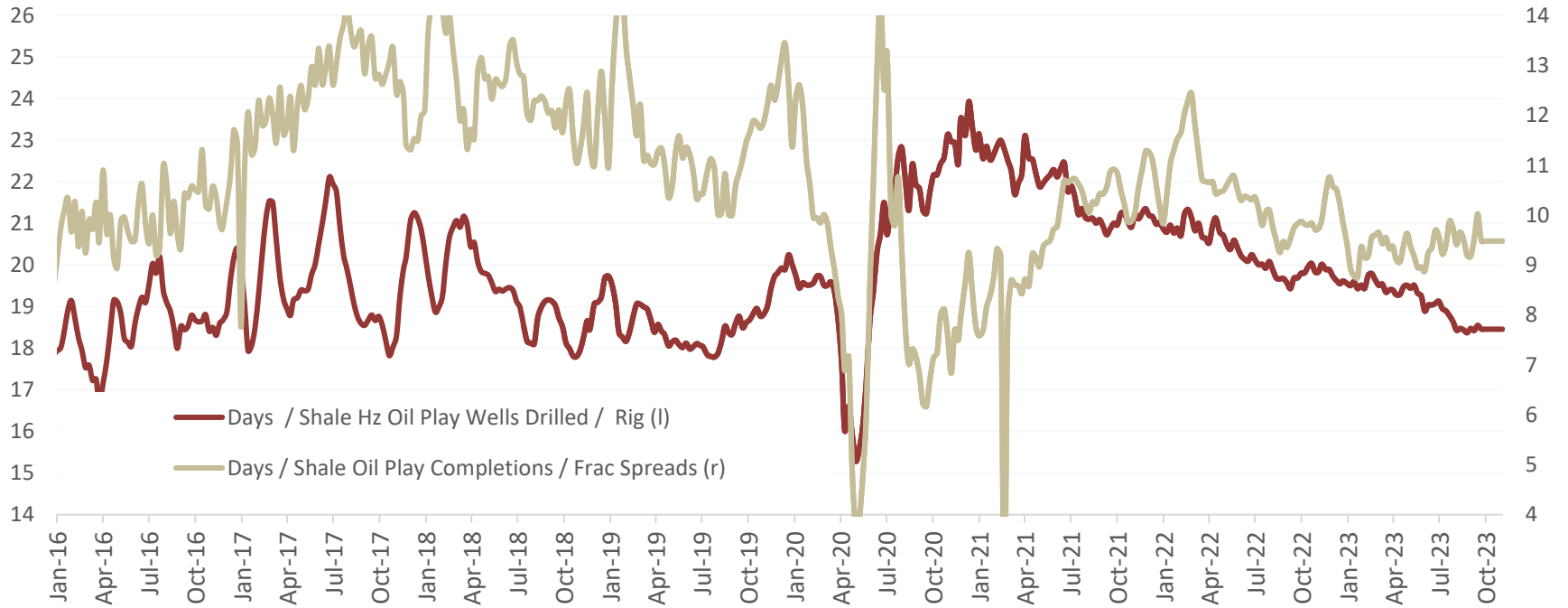
	Latest HZ Rig Count	Trough August 14, 2020				Prior Peak Nov. 16, 2018			
		Trough Count	Rig Change	Percent Change	Pct of Rig Gained	Peak Count	Rig Change	Percent Change	Pct of Rigs Lost
- Williston	32	11	21	191%	7%	53	(21)	-40%	6%
- Permian	292	114	178	156%	60%	441	(149)	-34%	44%
- Eagle Ford	47	10	37	370%	13%	70	(23)	-33%	7%
- DJ Niobrara	14	1	13	1300%	4%	28	(14)	-50%	4%
- Cana Wdford	10	6	4	67%	1%	58	(48)	-83%	14%
- Other US	48	5	43	860%	15%	133	(85)	-64%	25%
- Total	443	147	296	201%	100%	783	(340)	-43%	100%
		<i>05/22/20</i>							
- Frac Spreads	276	45	231	513%		433	(157)	-36%	
<i>Spread Ratio</i>	<i>62.3%</i>	<i>30.6%</i>				<i>55.3%</i>			

Frac Spreads and Horizontal Oil Rigs



- Frac spreads were -5 to 270

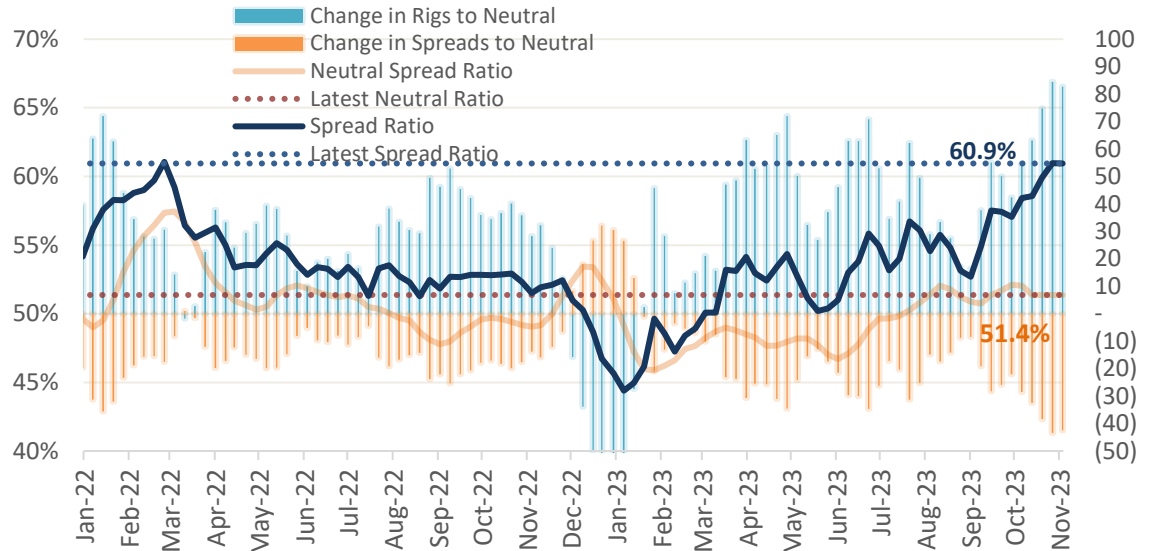
Productivity of Rigs and Spreads: Days per Well



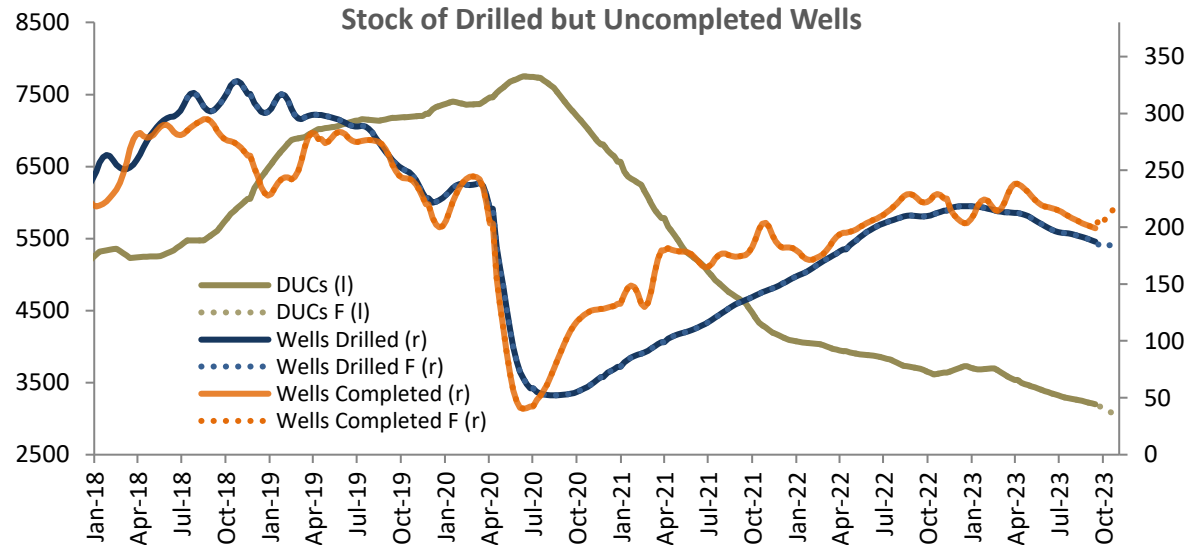
Rig and Spread Productivity

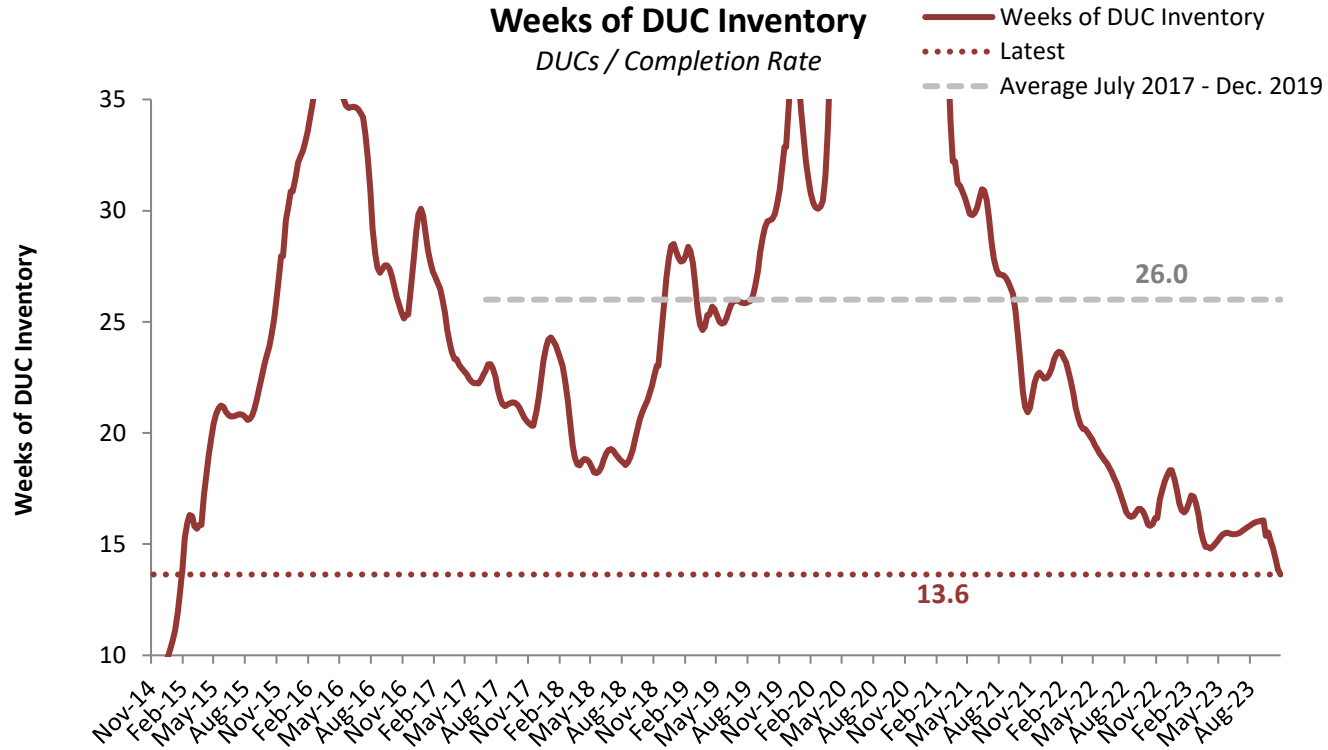
- At estimated productivity levels and current rig and spread counts, the DUC inventory is declining
- To hold DUCs constant, rigs would have to fall by 83 or spreads would have to rise by 42

The Spread Ratio and Rigs and Spreads for DUC Neutrality



Horizontal Oil Wells Drilled and Completed per Week

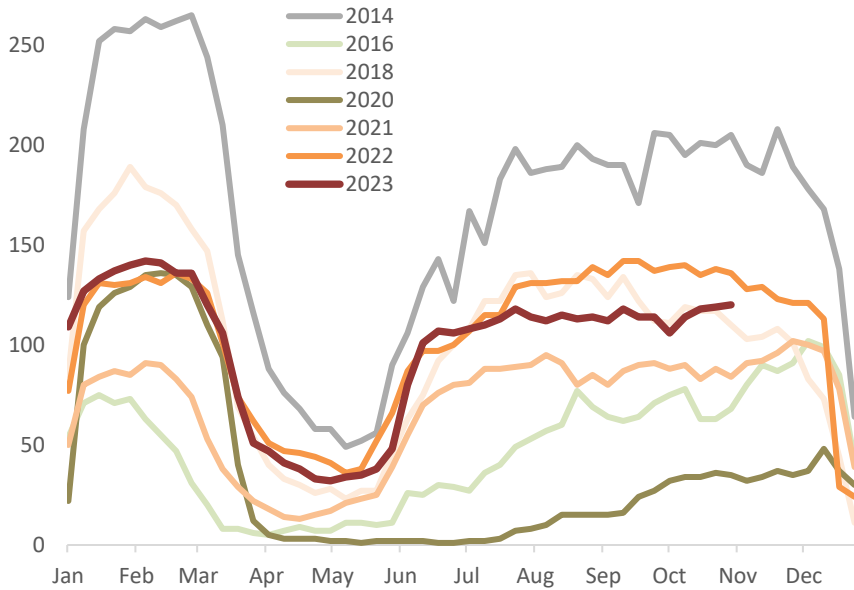




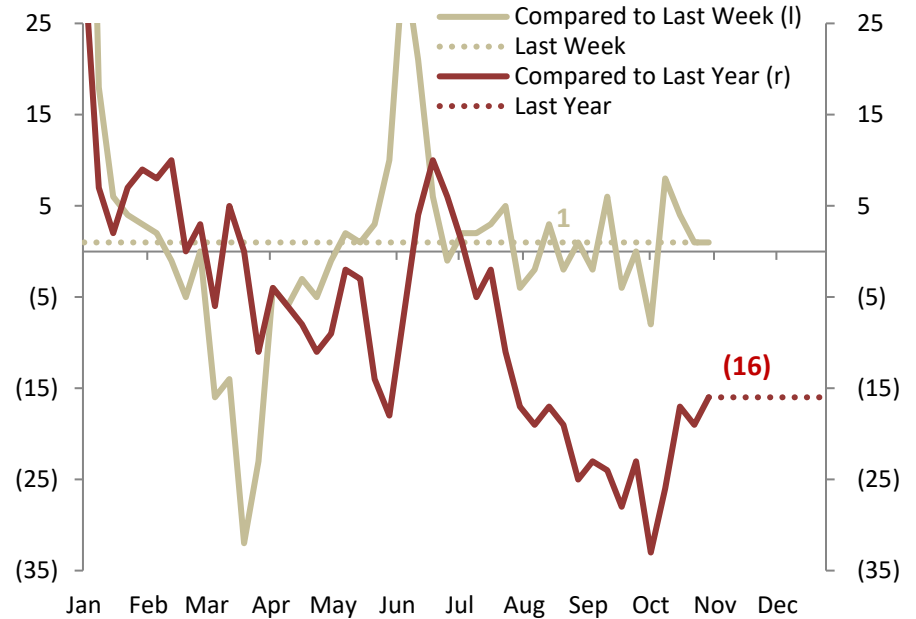
- DUC inventories have fallen back a nine year low of 13.6 weeks

Canada Horizontal Oil Rig Count

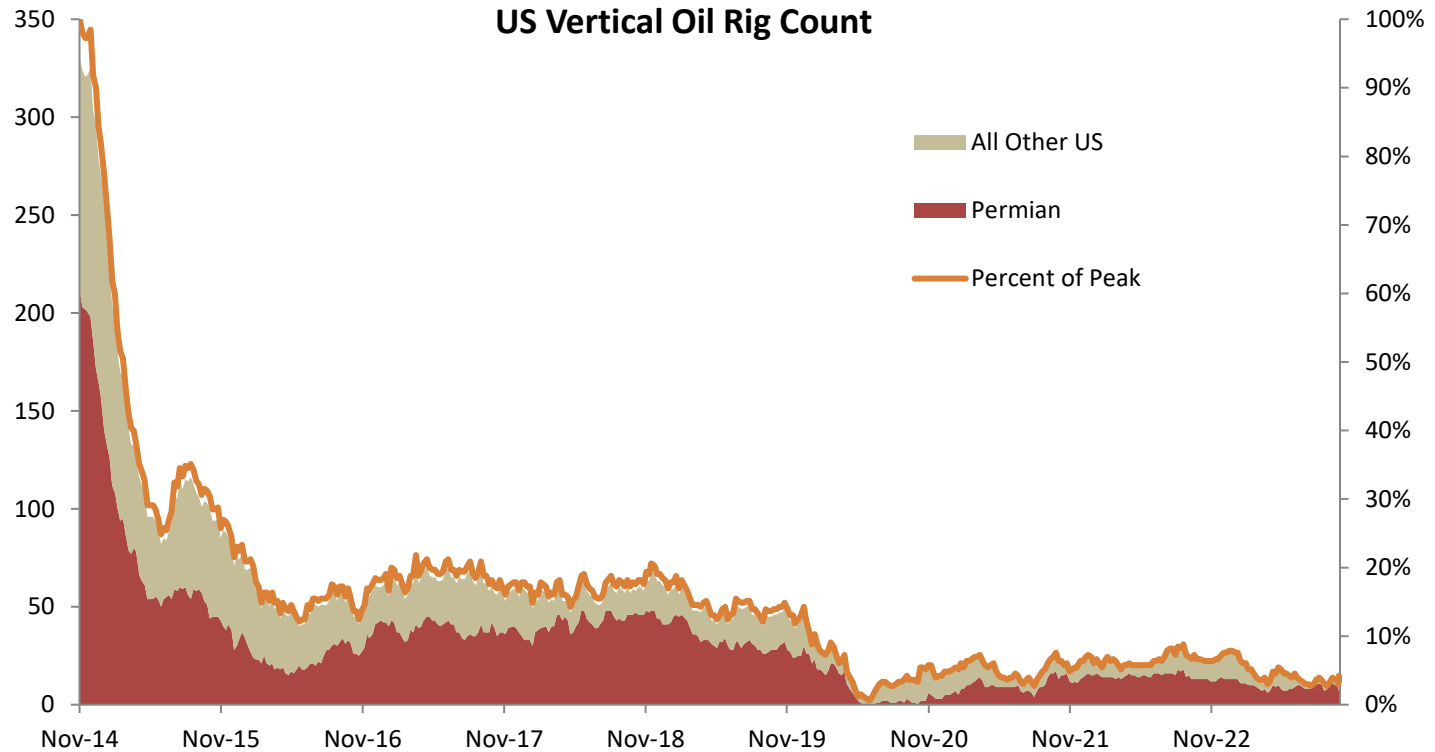
Canada Horizontal Oil Rigs



Compared to Previous Week, Previous Year

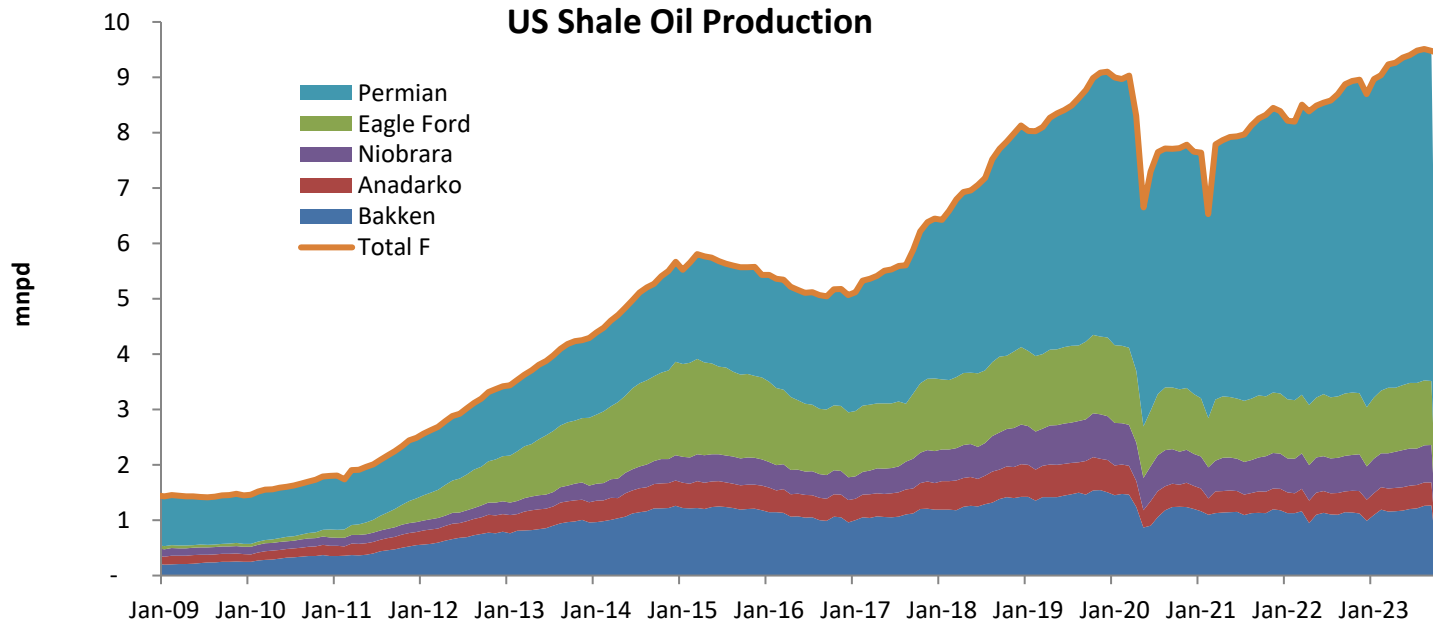


- Canada horizontal oil rigs were +1 to 120 last week
- Rigs counts were -16 compared to the same week last year



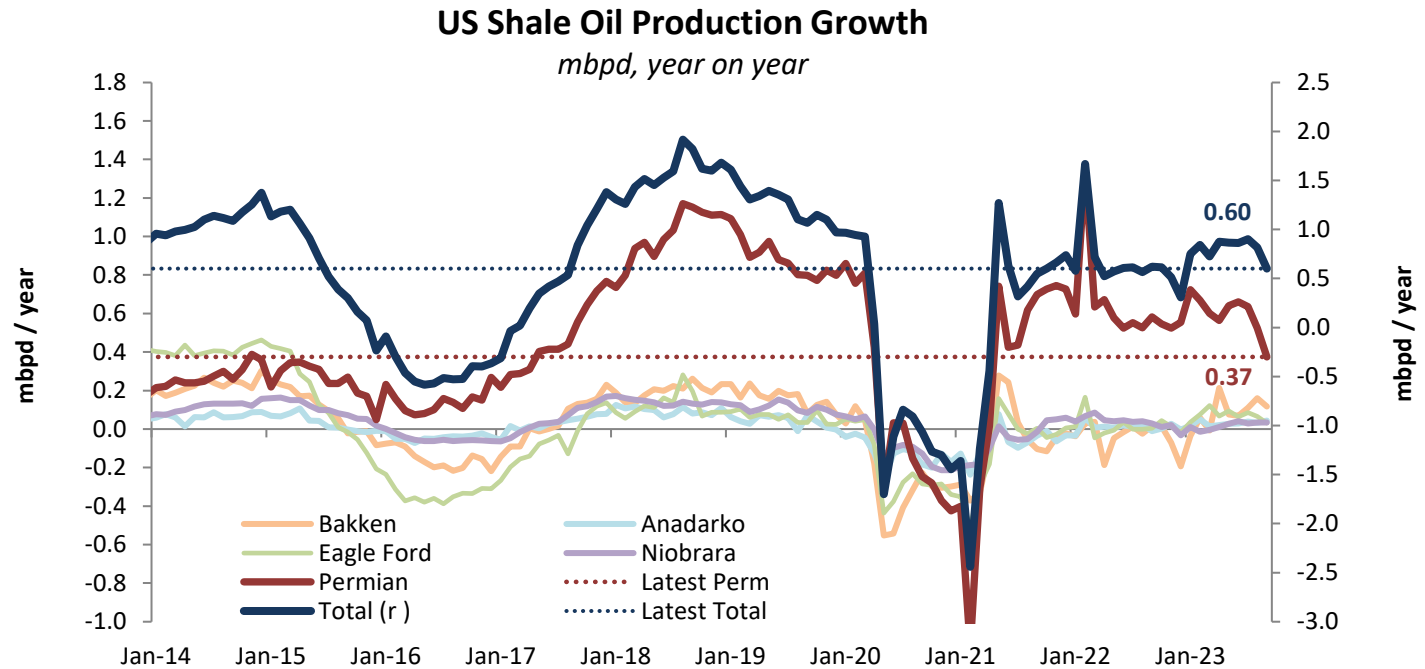
- Vertical oil rigs: +1 to 13
- Permian: +1
- All Other US: +0

US Shale Production Growth (Oct. DPR)



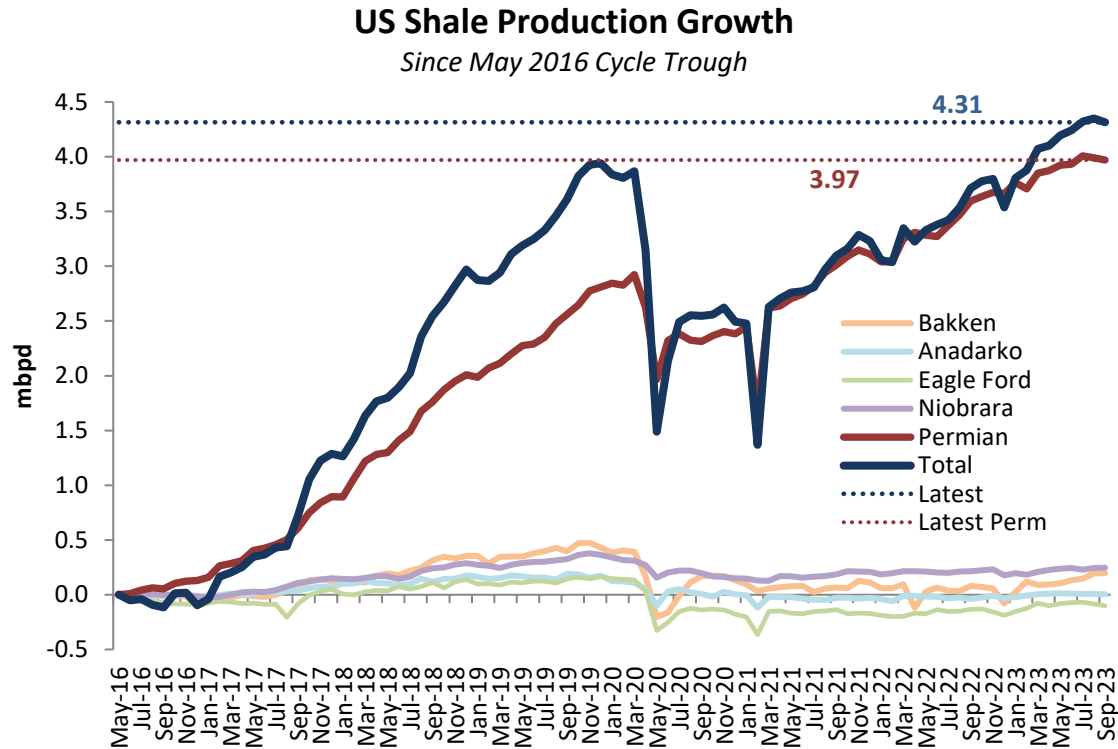
- In the October DPR report, September crude and condensate production from key shale plays fell to 9.47 mbpd, down 34 kbpd from August.
- However, total August C+C production was revised up a whopping 237 kbpd, and the May-August period was revised up by an eye-popping 182 kbpd on average
- The EIA continues to see peak shale oil output for July 2023. Having said that, revisions have been so large lately that my confidence in reported numbers is at a low at present. The EIA has been in a revision spree lately – which happens sometimes – but it does make the data hard to interpret, and reliable month-to-month comparability may not be restored until early next year.

US Shale Production Growth (Oct. DPR)



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

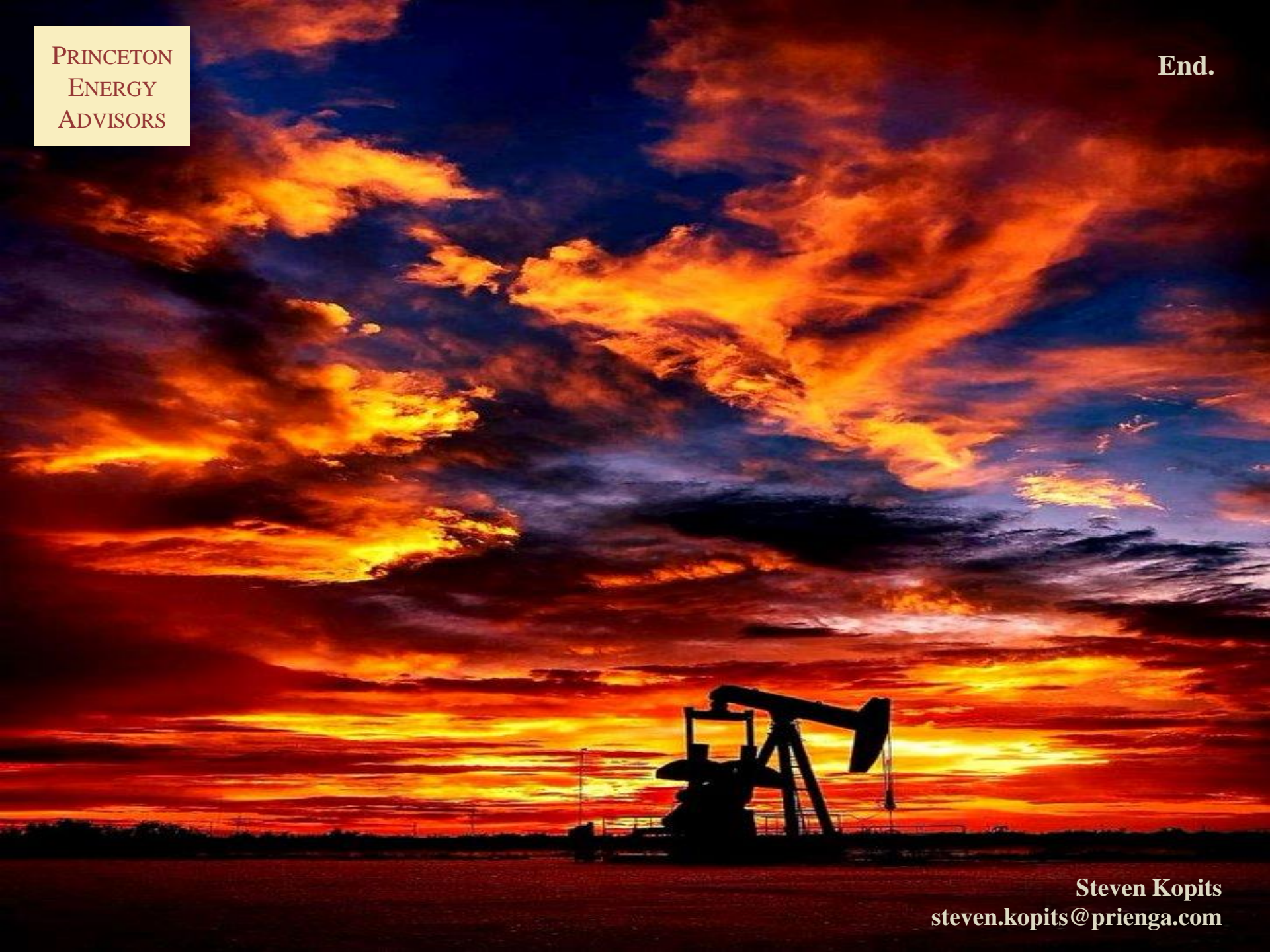
US Shale Production Growth from May '16 (Oct. DPR)



- Since the prior cyclical trough in May 2016, total shale oil production from the key plays is up 4.3 mbpd
- All but 340,000 bpd of this growth comes from the Permian basin

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