Oil and Gas Development in the Permian basin

September 2019
Kayrros monitors wells with satellites as soon as a permit is filed.

1. Permit is filed, location cleared
2. Drilling takes place, rig on site
3. Fracking takes place
4. Well enters production

Sources: Kayrros, Sentinel, Google Earth
Kayrros E&P intelligence covers all major US tight oil plays.

Sources: Kayrros, OpenStreetMap, Leaflet, Kpler.ai

Kayrros monitors more than 90,000 individual well locations across the most active tight oil basins in the Lower 48, which together produce around 8 MMbpd.
2018 record growth in the US was followed by a slowdown in H1-19

Onshore Oil Production, main states* (EIA 914)

Main onshore oil producing states* contain Texas, North Dakota, New Mexico, Colorado, Wyoming, Oklahoma

Sources: Kayrros, EIA
The slowdown is felt across all key tight oil producing basins.

Sources: Kayrros, EIA
Kayrros measured completions started to slow in Sep-18, together with production.

Completion rate vs M/M change in production, main states*

Main onshore oil producing states* contain Texas, North Dakota, New Mexico, Colorado, Wyoming, Oklahoma.

Sources: Kayrros, EIA
Satellites unveiled the true trend in well completions - unlike data modeled from lagged reporting.

Kayrros-detected wells compared to FracFocus and EIA model, Permian basin

Sources: Kayrros, EIA, Frac Focus
Kayrros detected completions for public companies match what they reported to the SEC.

Kayrros-detected Permian well completions for public companies which report to SEC versus FracFocus in 2018.

Number of completed wells

- Companies that report to SEC
- All other companies

Sources: Kayrros, Company Filings, Frac Focus
Unreported well completions result in overstated DUC inventory

Kayrros Permian DUC inventory vs. EIA DUC inventory, Permian Basin

Sources: Kayrros, EIA
Permian trends
Activity in the Permian suffered from takeaway capacity constraints in H2-2018

Permian oil production vs takeaway capacity

Sources: Kayrros, Reuters, EIA, RBN Energy
Majors are ramping up activity while independents are facing capital discipline

Rig breakdown by operator types, Permian basin

Sources: Kayrros
Permian rig counts declined throughout Q2-2019

Kayrros Permian active drilling rig count (4-week average)

Sources: Kayrros
Shortening well development cycle times improving capital efficiency

Quarterly spud-to-completion cycle for the major tight oil plays normalized to 10k ft laterals

Sources: Kayrros
All types of operators exhibit efficiency gains, but private companies still lag in the Delaware

**Frac duration by operator type normalized per 10k ft lateral**

Delaware

Midland

Sources: Kayrros
Halliburton retains the lion’s share

Kayrros Permian active frac fleet count by OFS company

Sources: Kayrros
Steady completion rates expected to maintain L48 crude output growth, albeit at a slower rate compared to 2018

Kayrros Permian crude oil production forecast

Sources: Kayrros, EIA
Activity remains at historical highs

Flaring heatmap from 2012 to 2019 in the Permian Basin

Sources: Kayrros, Leaflet, NOAA