Drilling Productivity Report

For key tight oil and shale gas regions

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Year-over-year summary

Drilling Productivity Report

October 2019

drilling data through September
projected production through November

New-well oil production per rig
barrels/day

New-well gas production per rig
thousand cubic feet/day

Legacy oil production change
thousand barrels/day

Legacy gas production change
million cubic feet/day

Indicated monthly change in oil production (Nov vs. Oct)
 thousand barrels/day

Indicated monthly change in gas production (Nov vs. Oct)
million cubic feet/day

Oil production
 thousand barrels/day

Natural gas production
million cubic feet/day

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Anadarko Region

Drilling Productivity Report

October 2019

Monthly additions from one average rig

November

Oil +9 barrels/day

month over month

October

Gas +26 thousand cubic feet/day

month over month

New-well oil production per rig

barrels/day

Rig count

rigs


New-well gas production per rig

thousand cubic feet/day

Rig count

rigs


Legacy oil production change

thousand barrels/day


Legacy gas production change

million cubic feet/day


Indicated change in oil production (Nov vs. Oct)

thousand barrels/day

0 15 30 45 60 75 90 105 120

Oct 554 Mbb/d

Production from new wells

Legacy production change

Net change

Nov 541 Mbb/d

Anadarko Region

Oil production

thousand barrels/day


Anadarko Region

Natural gas production

million cubic feet/day


Anadarko Region

Indicated change in natural gas production (Nov vs. Oct)

million cubic feet/day

0 100 200 300 400 500

Oct 7,467 MMcf/d

Production from new wells

Legacy production change

Net change

Nov 7,336 MMcf/d
**Bakken Region**

**Drilling Productivity Report**

October 2019

drilling data through September
projected production through November

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**Oil**
+28 barrels/day
month over month

**Gas**
+59 thousand cubic feet/day
month over month

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**Bakken Region**

**New-well oil production per rig**

- **barrels/day**
  - 1,750
  - 1,500
  - 1,250
  - 1,000
  - 750
  - 500
  - 250
  - 0

- **New-well oil production per rig**
- **Rig count**
  - 250
  - 200
  - 150
  - 100
  - 50
  - 0

---

**Bakken Region**

**Legacy oil production change**

- **thousand barrels/day**
- (20)
- (40)
- (60)
- (80)
- (100)
- (120)

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**Bakken Region**

**Indicated change in oil production (Nov vs. Oct)**

- **thousand barrels/day**
- +82
- -71
- +11

---

**Bakken Region**

**Natural gas production**

- **million cubic feet/day**
- 9,000
- 7,500
- 6,000
- 4,500
- 3,000
- 1,500
- 0

---

**Bakken Region**

**New-well gas production per rig**

- **thousand cubic feet/day**
- 10,500
- 9,000
- 7,500
- 6,000
- 4,500
- 3,000
- 1,500
- 0

---

**Bakken Region**

**Legacy gas production change**

- **million cubic feet/day**
- (20)
- (40)
- (60)
- (80)
- (100)
- (120)

---

**Bakken Region**

**Indicated change in natural gas production (Nov vs. Oct)**

- **million cubic feet/day**
- +123
- -111
- +12
Niobrara Region
Drilling Productivity Report

Oil +5 barrels/day
month over month

Gas +6 thousand cubic feet/day
month over month

Niobrara Region
New-well oil production per rig
barrels/day

Niobrara Region
Legacy oil production change
thousand barrels/day

Niobrara Region
Indicated change in oil production (Nov vs. Oct)
thousand barrels/day

Niobrara Region
Oil production
thousand barrels/day

Niobrara Region
Natural gas production
million cubic feet/day

Niobrara Region
New-well gas production per rig
thousand cubic feet/day

Niobrara Region
Legacy gas production change
million cubic feet/day

Niobrara Region
Indicated change in natural gas production (Nov vs. Oct)
million cubic feet/day

Oil +6 thousand barrels/day
month over month
### Permian Region

#### Oil Production

- **New-well oil production per rig**
  - Production from new wells
  - Legacy production change
  - Net change

- **Legacy oil production change**
  - Thousand barrels/day

- **Indicated change in oil production (Nov vs. Oct)**
  - Thousand barrels/day

- **Oil production**
  - Thousand barrels/day

#### Natural Gas Production

- **New-well gas production per rig**
  - Production from new wells
  - Legacy production change
  - Net change

- **Indicated change in natural gas production (Nov vs. Oct)**
  - Million cubic feet/day

- **Natural gas production**
  - Million cubic feet/day

### Additional Information

- **Oil additions from one average rig**
  - 794 barrels/day November
  - 783 barrels/day October

- **Gas additions**
  - 1,465 thousand cubic feet/day November
  - 1,450 thousand cubic feet/day October

- **New-well oil production per rig**
  - 2010: 4,547 Mbbl/d
  - 2019: 4,610 Mbbl/d

- **New-well gas production per rig**
  - 2010: 15,866 MMcf/d
  - 2019: 16,076 MMcf/d

- **Rig count**
  - 2010: 800
  - 2019: 600

- **Rig count trends**
  - 2010: 800
  - 2019: 600

- **Oil and gas production change**
  - Oil: +63
  - Gas: +210

- **Drilling data through September**

- **Projected production through November**

- **Month over month**
  - Oil: +11 barrels/day
  - Gas: +15 thousand cubic feet/day
The Drilling Productivity Report uses recent data on the total number of drilling rigs in operation along with estimates of drilling productivity and estimated changes in production from existing oil and natural gas wells to provide estimated changes in oil\(^1\) and natural gas\(^2\) production for seven key regions. EIA’s approach does not distinguish between oil-directed rigs and gas-directed rigs because once a well is completed it may produce both oil and gas; more than half of the wells do that.

**Monthly additions from one average rig**

Monthly additions from one average rig represent EIA’s estimate of an average rig’s\(^3\) contribution to production of oil and natural gas from new wells. \(^4\) The estimation of new-well production per rig uses several months of recent historical data on total production from new wells for each field divided by the region’s monthly rig count, lagged by two months. \(^5\) Current- and next-month values are listed on the top header. The month-over-month change is listed alongside, with +/- signs and color-coded arrows to highlight the growth or decline in oil (brown) or natural gas (blue).

**New-well oil/gas production per rig**

Charts present historical estimated monthly additions from one average rig coupled with the number of total drilling rigs as reported by Baker Hughes.

**Legacy oil and natural gas production change**

Charts present EIA’s estimates of total oil and gas production changes from all the wells other than the new wells. The trend is dominated by the well depletion rates, but other circumstances can influence the direction of the change. For example, well freeze-offs or hurricanes can cause production to significantly decline in any given month, resulting in a production increase the next month when production simply returns to normal levels.

**Projected change in monthly oil/gas production**

Charts present the combined effects of new-well production and changes to legacy production. Total new-well production is offset by the anticipated change in legacy production to derive the net change in production. The estimated change in production does not reflect external circumstances that can affect the actual rates, such as infrastructure constraints, bad weather, or shut-ins based on environmental or economic issues.

**Oil/gas production**

Charts present all oil and natural gas production from both new and legacy wells since 2007. This production is based on all wells reported to the state oil and gas agencies. Where state data are not immediately available, EIA estimates the production based on estimated changes in new-well oil/gas production and the corresponding legacy change.

**Footnotes:**

1. Oil production represents both crude and condensate production from all formations in the region. Production is not limited to tight formations. The regions are defined by all selected counties, which include areas outside of tight oil formations.
2. Gas production represents gross (before processing) gas production from all formations in the region. Production is not limited to shale formations. The regions are defined by all selected counties, which include areas outside of shale formations.
3. The monthly average rig count used in this report is calculated from weekly data on total oil and gas rigs reported by Baker Hughes.
4. A new well is defined as one that began producing for the first time in the previous month. Each well belongs to the new-well category for only one month. Reworked and recompleted wells are excluded from the calculation.
5. Rig count data lag production data because EIA has observed that the best predictor of the number of new wells beginning production in a given month is the count of rigs in operation two months earlier.
The data used in the preparation of this report come from the following sources. EIA is solely responsible for the analysis, calculations, and conclusions.

**Drilling Info** (http://www.drillinginfo.com) Source of production, permit, and spud data for counties associated with this report. Source of real-time rig location to estimate new wells spudded and completed throughout the United States.

**Baker Hughes** (http://www.bakerhughes.com) Source of rig and well counts by county, state, and basin.

**North Dakota Oil and Gas Division** (https://www.dmr.nd.gov/oilgas) Source of well production, permit, and completion data in the counties associated with this report in North Dakota.

**Railroad Commission of Texas** (http://www.rrc.state.tx.us) Source of well production, permit, and completion data in the counties associated with this report in Texas.

**Pennsylvania Department of Environmental Protection** (https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Welcome.aspx) Source of well production, permit, and completion data in the counties associated with this report in Pennsylvania.

**West Virginia Department of Environmental Protection** (http://www.dep.wv.gov/oil-and-gas/Pages/default.aspx) Source of well production, permit, and completion data in the counties associated with this report in West Virginia.

**Colorado Oil and Gas Conservation Commission** (http://cogcc.state.co.us) Source of well production, permit, and completion data in the counties associated with this report in Colorado.

**Wyoming Oil and Conservation Commission** (http://wogcc.state.wy.us) Source of well production, permit, and completion data in the counties associated with this report in Wyoming.

**Louisiana Department of Natural Resources** (http://dnr.louisiana.gov) Source of well production, permit, and completion data in the counties associated with this report in Louisiana.

**Ohio Department of Natural Resources** (http://oilandgas.ohiodnr.gov) Source of well production, permit, and completion data in the counties associated with this report in Ohio.

**Oklahoma Corporation Commission** (http://www.occeweb.com/og/oghome.htm) Source of well production, permit, and completion data in the counties associated with this report in Oklahoma.