

# KENAI SAFETY SUMMIT

## “Safety is spelled H-S-E”

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Kenai, AK

By

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# Definition

- “Hydraulic fracturing, or fracking, is the process of pumping fluid and sand down a wellbore at high rates and pressures with the end effect of creating a fracture system in the hydrocarbon-bearing rock and allowing a more conductive pathway for the oil and gas to the wellbore.”

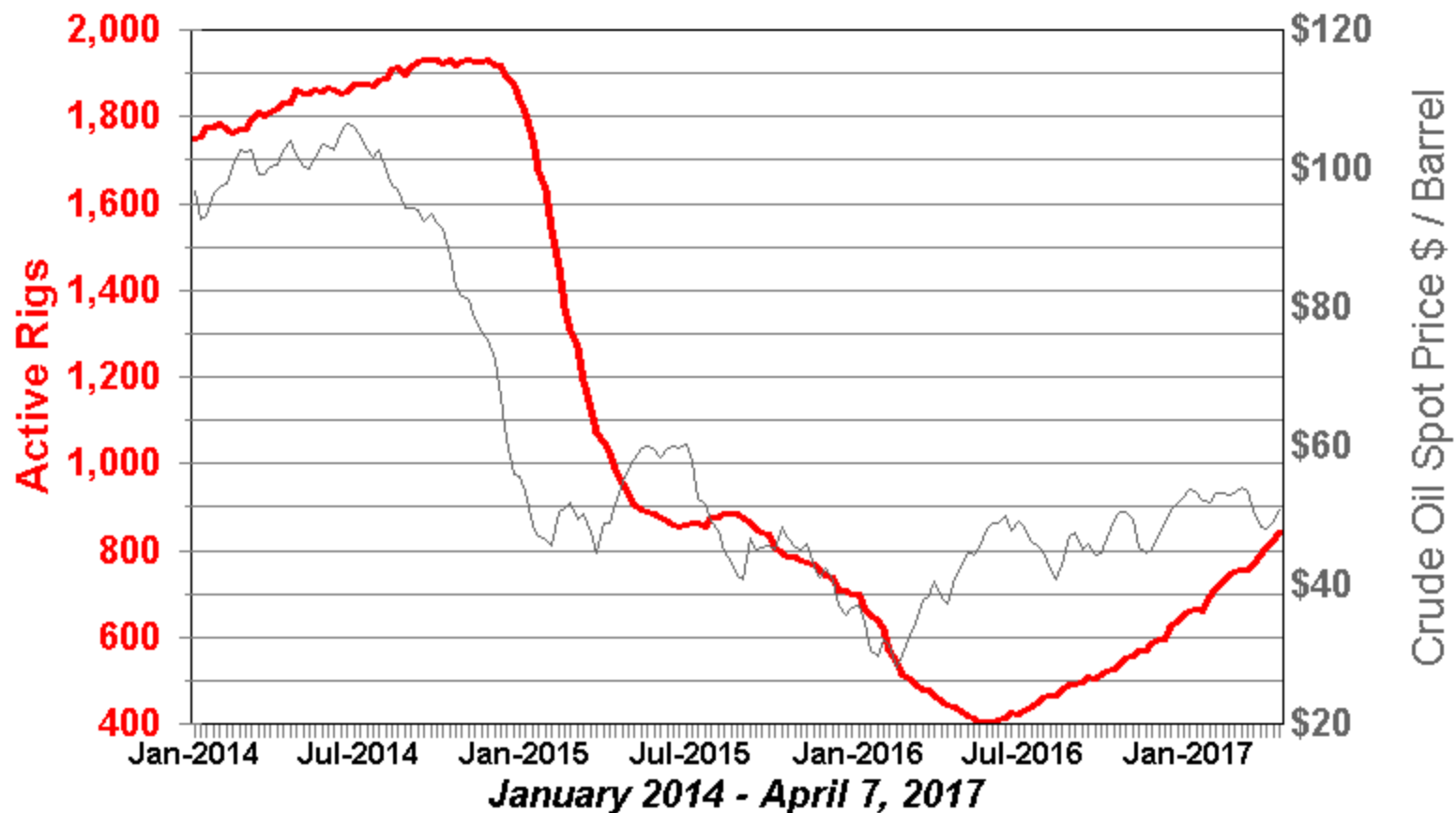
# Drill Site - Front Range Colorado







## U. S. Rotary Rig Count Total Active Rigs



Sources: Baker-Hughes, Energy  
Information Administration (DOE),  
WTRG Economics

WTRG Economics ©2017

[www.wtrg.com](http://www.wtrg.com)  
(479) 293-4081

# Crude Oil Production



Mbbl

120,000

100,000

80,000

60,000

40,000

20,000

0

1985

1990

1995

2000

2005

2010

**Texas Field Production of Crude Oil**  
Month : Jul 2014  
96,168 Mbbl

— Texas Field Production of Crude Oil

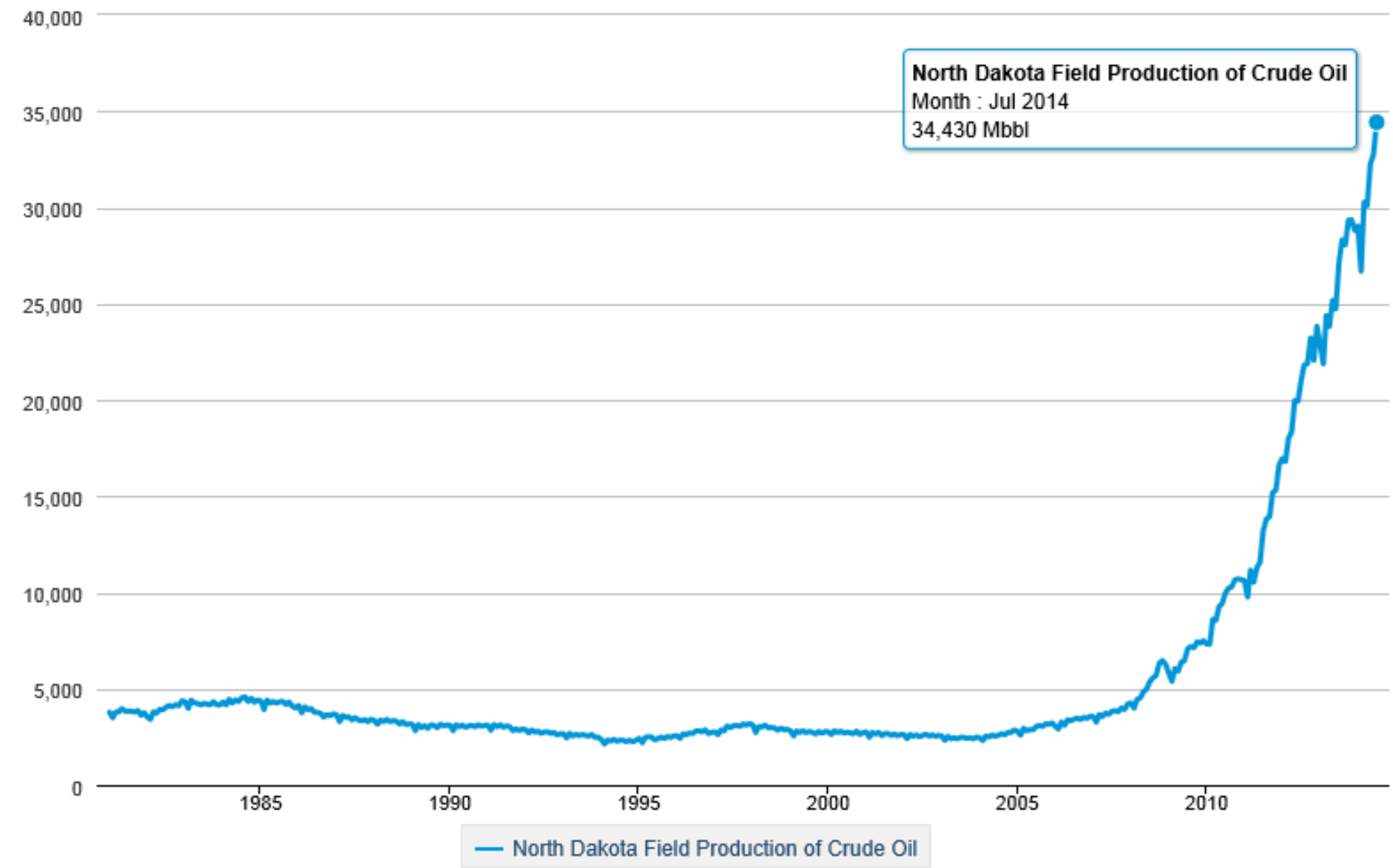


Source: U.S. Energy Information Administration

# Crude Oil Production



Mbbl



— North Dakota Field Production of Crude Oil



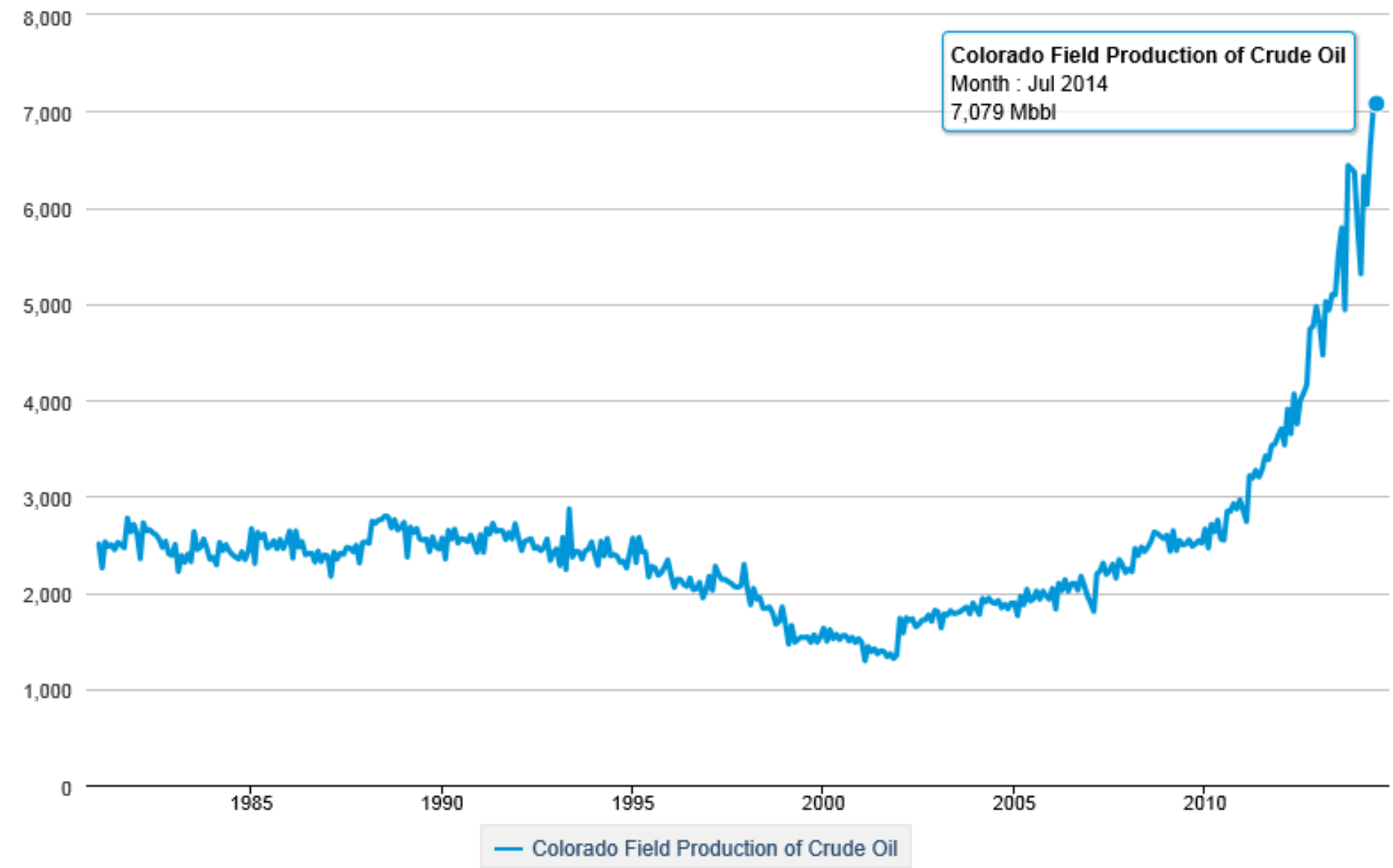
Source: U.S. Energy Information Administration



# Crude Oil Production



Mbbl



— Colorado Field Production of Crude Oil



Source: U.S. Energy Information Administration

# Safety = HSE

- Safety
  - Health
  - Environment
- Integrated
- Challenges
  - Low-price environment
  - Seasoned veteran employees
  - Ambitious new-comers (SSE)

# Integrated Terms

- Safety
  - Operations
  - Acute – life threatening
- Health
  - Processes
  - Chronic – life threatening
- Environmental
  - Cultural
  - Community – life-style threatening

# Safety

- Getting up/down off of equipment
- Slips, Trips and Falls
- Driving
- Isolation–Hi Pressure Exclusion Zone
- Security/Sabbotage

# What are the Hazards?



Following are some of the more common body placement/manual handling hazards:

<b>Hazard</b>	<b>Result (actual injuries)</b>
Striking against (hit with hammer)	Fractures, bruises
Caught on/in/between	Bruises, lacerations, crushing
Heavy lifting	Strains/sprains due to incorrect lifting
Awkward positions	Strain/sprains, lacerations, bruises
Repetitive motions	Repetitive strains, tendonitis
Incorrect lifting	Poor placement, not planning the job

# Health

- Crystalline silica (frac sand)
- Noise (Strict Colorado Standards)

# Crystalline silica

- New OSHA standards
- June 2016/ 2018 to comply
- .1 Mg/ Cu Meter to .05 Mg/ Cu Meter
- Permissible Exposure Limit (PEL)
- TWA of 8 hours

# Crystalline silica

- 2.3 million workers are exposed
- Foundries
- Etching as in sandblasting
- Abrasive material in soaps/scouring
- Filler in plastics and rubber



# Crystalline silica

- Pneumatic trucking - **Eliminate**
- Coatings - expensive
- Vacuum systems
- Screw conveyors
- Chemicals – Hydrogen bonding
- Chemicals – Dust suppressants
- **Moveable conveyor systems**
- **Containers**

# Sandstorm



# Sandstorm





# Containers



# Containers



# Environmental

- Maconda blowout - 2010
- Valdez tanker - 1989
- Local
  - Spills
  - Traffic noise and dust
  - Methane escape/capture

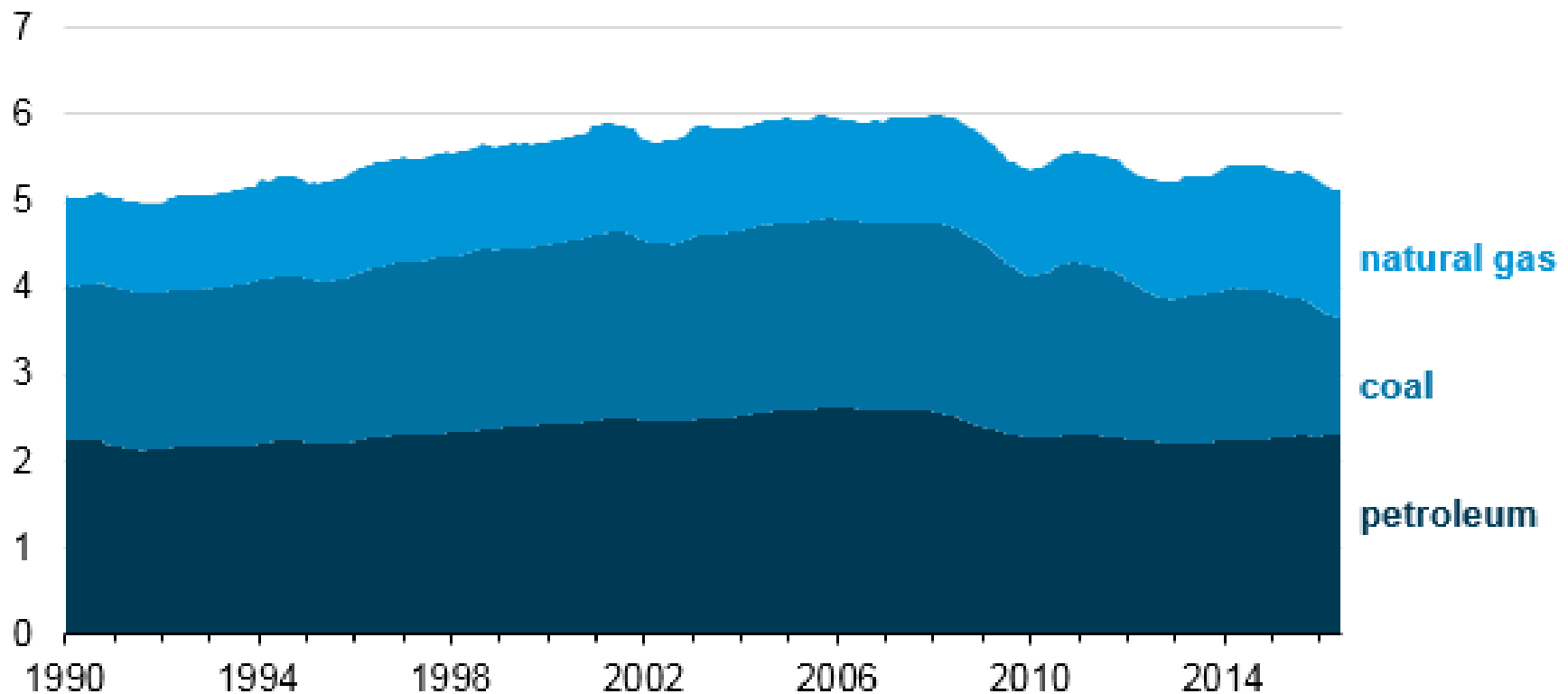
# Methane Escape

- BLM Venting and Flaring Rule
  - Redundant
  - Established November 2016
- Better connections
- Better monitoring(infra-red cameras)
- Better tank top seals



# Methane Escape

Energy-related carbon dioxide emissions by source (Jan 1990 - Jun 2016)  
12-month moving total, billion metric tons





## DAPL

- \$40,000,000
- 800 truckloads human waste
- 2 vehicles ended up in the River
- Abandoned animals
- Don't create a bigger environmental disaster

# President Trump's Impact

- Rollback of the Climate Change Rules
- EPA will rewrite Clean Power Plan
- BLM Fracking Rules delayed
- Methane Rules relaxed
- DAPL and Keystone XL Pipeline fast-tracked

# Understanding Fracturing Fluid



To create productive natural gas wells, companies force fluid thousands of feet below the surface at high pressure to crack shale rock and release trapped natural gas. This extraction technique is called hydraulic fracturing. The fluid used in the process is made up almost entirely of water and sand. However, it also includes a very small percentage of chemical additives that help make the process work.



Boulder Oil Field, 1901.

Center of the Boulder oil field. J.B. Sturtevant Archives, University of Colorado at Boulder Libraries.

The field has since been reclaimed.





# Credits

- [Energyfromshale.org](http://Energyfromshale.org)
- [Studyfracking.com](http://Studyfracking.com)
- [Energyindepth.org](http://Energyindepth.org)
- [Fracfocus.org](http://Fracfocus.org)
- US Energy Information Administration
- [RockyMountainEnergyForum.com](http://RockyMountainEnergyForum.com)

# Credits

- COGCC
- Colorado Oil and Gas Association
- Western Energy Alliance



# Demographic Breakdown of the Oil and Gas Industry

- BOL Statistics
- African American – 6.2%
- Asian – 2.3%
- Hispanic – 17.8%
- Whites – 73%

# Kyoto Protocol

US Energy Information Agency reports that America's greenhouse gas emissions have **fallen 7 percent to 1992 levels**. US, a non participant in Kyoto Protocol Treaty, is the only nation to meet 1999 forecasted reduction