

Hydraulic Fracturing Research

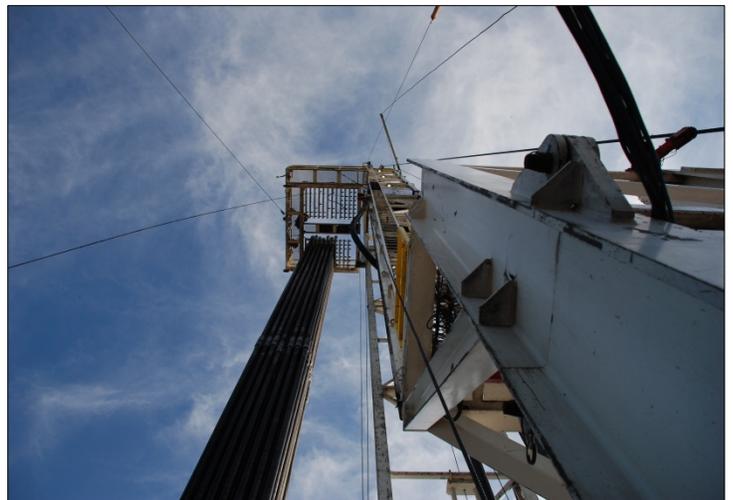
FY 2015 President's Proposed Budget

Total request is \$18.6 million (\$8.3 million above FY 2014 enacted level)

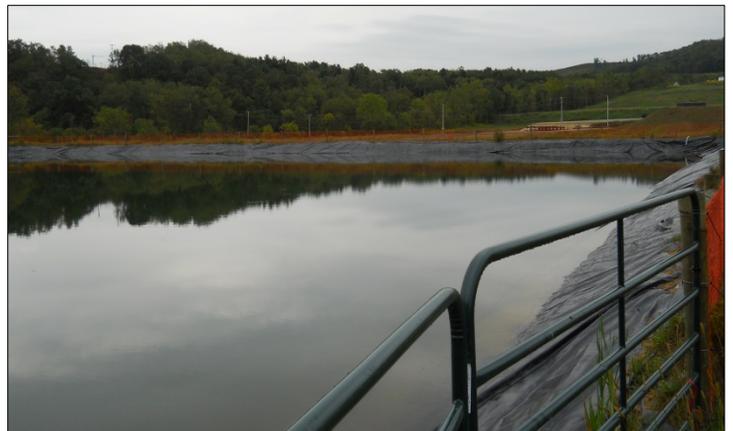
The development of oil and gas resources through hydraulic fracturing is playing an important and rapidly growing role in the domestic energy portfolio of the United States. Shale and other unconventional oil and gas formations are found throughout the United States, including beneath Federal, State, tribal and private lands. The development and extraction of unconventional oil and gas resources are accomplished through directional drilling and high-volume hydraulic fracturing.

While there are economic benefits associated with oil and gas production, and industry has developed best management practices for well site activities, concerns remain about potential environmental, health, and safety impacts of hydraulic fracturing and associated waste disposal activities.

In 2015, the USGS is requesting a funding increase to continue research to meet the President's emphasis on the 2012 Executive Order "Supporting Safe and Responsible Development of Unconventional Domestic Natural Gas Resources." This is part of a 2012 Memorandum of Agreement between the Department of the Interior, the Department of Energy (DOE), and the Environmental Protection Agency (EPA) that formalized collaboration on unconventional oil and gas research. This collaboration aims to understand and address potential environmental, human health, and safety impacts of hydraulic fracturing and associated operational activities.



The request includes a program funding increase of \$8.336 million to address priority science issues related to hydraulic fracturing. USGS research efforts will focus on a number of activities including resource characterization and assessments, water quality and availability, ecological impacts, effects on people, and induced seismicity. In addition, the USGS will emphasize products that contain decision-ready information, such as geologic maps, natural resource assessments, contaminant reports, and hazard assessments.



Energy and Water Resources

Resource assessments provide critical evaluations of the quantity of resource yet to be found and, importantly, where future energy development might and might not take place. The proposed 2015 funding increases will help the USGS begin resource assessments in additional basins that require hydraulic fracturing to produce, such as those currently underway in the Barnett and Green River Shales.



In addition, the USGS will begin assessing water quantity needs for the development of unconventional petroleum resources and study how to identify alternate sources of water to replace the use of scarce fresh water.

Baseline water quality studies of surface and groundwater prior to drilling, sampling method development, historical data compilation, and sampling of waters produced during oil and gas production will all be initiated or expanded.

Contaminants and Wildlife Impacts

USGS ecosystems and environmental health science is a key link between energy development and the sustainability of our natural environment, and is at the forefront of providing information for management decisions. With the proposed 2015 funding increase, the USGS will undertake research and monitoring to study contaminants associated with produced and flowback waters from oil and gas development, including “stray gas,” and other naturally occurring constituents that could affect the quality of water supplies and the environment. Groundwater flow and geochemical models will be used to determine potential for contamination of aquifers and surface waters, helping ensure that unconventional oil and gas are developed in ways that do not impair the nation’s water resources.

In addition, in partnership with the DOE and the EPA, the USGS will collect ecological and human health data, such as acute and chronic toxicity impacts, toxicity mechanisms and pathways and the cumulative impacts and risks at the landscape scale.

Induced Seismicity

In 2013 and 2014, the USGS responded to significant increases in earthquake rates in Oklahoma, Kansas, and Texas, accompanied by moderate-magnitude, lightly damaging earthquakes. The USGS is currently studying whether or not certain types of fluid injection in particular geologic settings are likely to trigger earthquakes. The work combines analysis of earthquake sources with related geologic and hydrologic data to determine those factors that affect induced seismicity from subsurface disposal of fluids. This information could be used to guide changes to disposal operations, such as by adding new wells or changing injection parameters. With the proposed increase, the USGS will expand the number of sites being analyzed, monitored, and assessed in detail.