EPA
www.epa.gov/research
science in ACTION
INNOVATIVE RESEARCH FOR A SUSTAINABLE FUTURE

EPA's Study on the Potential Impact of Hydraulic Fracturing on Drinking Water Resources

On March 18, 2010, at the request of the U.S. Congress, EPA announced plans to develop a comprehensive research study on the potential impact of hydraulic fracturing on drinking water resources. Natural gas plays a key role in our nation's clean energy future and the process known as hydraulic fracturing is one way of accessing this vital resource. There are questions whether hydraulic fracturing may impact ground water and surface water quality in ways that threaten human health and the environment. EPA believes a transparent, research-driven approach with significant stakeholder involvement can address questions about hydraulic fracturing and strengthen our clean energy future.

The Need for a Study

- Recent advances in drilling technologies have made access to vast reserves of natural gas and oil economically possible in the U.S.
- As a result, hydraulic fracturing has increased in some regions and occurs in a wider variety of geologic formations.
- These changes have led to an increased public awareness of questions concerning the potential for hydraulic fracturing to impact drinking water resources.

EPA has Designated the Final Report of the Study as a Highly Influential Scientific Assessment (HISA)

- EPA has designated the study as a highly influential scientific assessment for purposes of applying peer-review guidelines. By the end of 2012, EPA will update its peer-review plan to describe the steps the Agency is taking to ensure appropriate peer review of the specific research products within the study.

Developing a Study Plan (Complete)

EPA developed a study plan on hydraulic fracturing which was reviewed by the agency's Science Advisory Board (SAB) and subject to extensive stakeholder involvement and public comment. The study plan, finalized on November 3, 2011, outlines five fundamental questions associated with the hydraulic fracturing lifecycle:

1) **Water Acquisition:** What are the potential impacts of large volume water withdrawals from ground and surface waters on drinking water resources?
2) **Chemical Mixing:** What are the possible impacts of surface spills on or near well pads of hydraulic fracturing fluids on drinking water resources?
3) **Well Injection:** What are the possible impacts of the injection and fracturing process on drinking water resources?
4) **Flowback and Produced Water:** What are the possible impacts of surface spills on or near well pads of flowback and produced water on drinking water resources?
5) **Wastewater Treatment and Waste Disposal:** What are the possible impacts of inadequate treatment of hydraulic fracturing wastewaters on drinking water resources?

Utilizing Cutting-Edge Research (Ongoing)

EPA has initiated five distinct research approaches for determining whether hydraulic fracturing can impact drinking water resources:

1) **Analysis of existing data** on hydraulic fracturing from industry, state and federal agencies, academia and other sources.
2) **Case studies** from real-world sites across the US, including locations where hydraulic fracturing has already occurred or will occur in the future.
3) **Laboratory studies** to provide data from experiments conducted in a controlled environment.
4) **Scenario evaluations** using sophisticated computer modeling to generate information about realistic hydraulic fracturing scenarios.
5) **Toxicological assessments** to summarize existing data on human health effects of chemicals currently known to be used in hydraulic fracturing.

EPA will publish Federal Register notices in 2012, 2013 and 2014 offering stakeholders an opportunity to submit information including peer-reviewed studies and data from ongoing or completed studies.

Study includes Data from Industry
On September 9, 2010, EPA issued information requests to nine national and regional hydraulic fracturing service providers. In August 2011, EPA issued information requests to nine randomly selected oil and gas well owner/operators. The data requested is integral to EPA's study, such as information on the chemical composition of fluids used in the hydraulic fracturing process, data on the impacts of the chemicals on human health and the environment, standard operating procedures at hydraulic fracturing sites and the locations of sites where fracturing has been conducted, and records of construction and operation for wells which had recently been hydraulically fractured.

Stakeholder Engagement (Ongoing)
EPA has continually affirmed its commitment to stakeholder engagement in the development of the study and has outlined goals that will:

- Increase technical engagement with the stakeholder community to ensure that EPA has ongoing access to a broad range of expertise and data from outside the Agency.
- Improve public understanding of the goals and design of the study.
- Ensure that EPA is current on changes in industry practices and technologies so the report of results reflects an up-to-date picture of hydraulic fracturing operations.
- Obtain timely and constructive feedback on projects undertaken as part of the study.
- Subject the report of results and research products supporting the report of results to meaningful and timely peer review, taking into account the study's designation as a Highly Influential Scientific Assessment (HISA).

Building on an already robust program of stakeholder engagement, EPA will take several steps to implement these goals to ensure the study has access to as much relevant data as possible while providing continued opportunities for stakeholder engagement:

- Periodic technical roundtables with invited experts
- Annual Federal Register Notices requesting public input
- Follow-up Technical workshops
- Frequent study updates through informal outreach opportunities

Study Progress Report (December 2012) and Report of Results
In December, 2012 EPA will issue a report that outlines the progress to date on each research project and preliminary study data. EPA's Science Advisory Board (SAB) is forming a panel of independent experts who will review the progress report. EPA will use stakeholder feedback, SAB advice and public comments in the development the final draft report, which will also be subject to public comment and SAB review.

"It is my goal to ensure that we are taking advantage of all the relevant expertise and peer-reviewed data outside the agency; obtaining timely and constructive technical feedback; clearly informing the public of the study's goals, design and progress; and keeping abreast of changes in industry practices and technologies that are relevant to the study and its ultimate conclusions."

Lisa P. Jackson, EPA Administrator
Letter to Stakeholders, July 23, 2012

For more information, please visit: www.epa.gov/hfstudy