

# Multi-Agency Collaboration on Unconventional Oil and Gas Research

Department of Energy  
Department of the Interior  
Environmental Protection Agency



## April 13, 2012 Memorandum

- DOE, DOI, and EPA will develop a multi-agency research plan to address the highest priority research questions associated with safely and prudently developing unconventional shale gas and tight oil resources (UOG).
- This program will focus on:
  - timely, policy-relevant science directed to research topics where collaboration among the three agencies can be most effectively and efficiently conducted
  - providing results and identifying technologies that support sound policy decisions to ensure the prudent development of energy sources while protecting human health and the environment.

# Multi-Year Research Plan

- By January 2013, the agencies will publish a multi-year Research Plan, that will
  - Analyze and synthesize the state of knowledge
  - Identify, categorize, and prioritize research topics relevant to the safety and environmental sustainability of unconventional oil and natural gas exploration and production
  - Identify gaps in available data
  - Identify research milestones and deliverables
  - Describe steps to promote transparency and maximize stakeholder participation
  - Establish mechanisms for cooperative relationships among the three agencies
  - Determine future plans and objectives
- By October 2012, the agencies will publish a draft of the Research Plan for public comment.
- The agencies will solicit comments from the scientific community, public, and relevant stakeholders, including holding periodic webinars for this purpose.

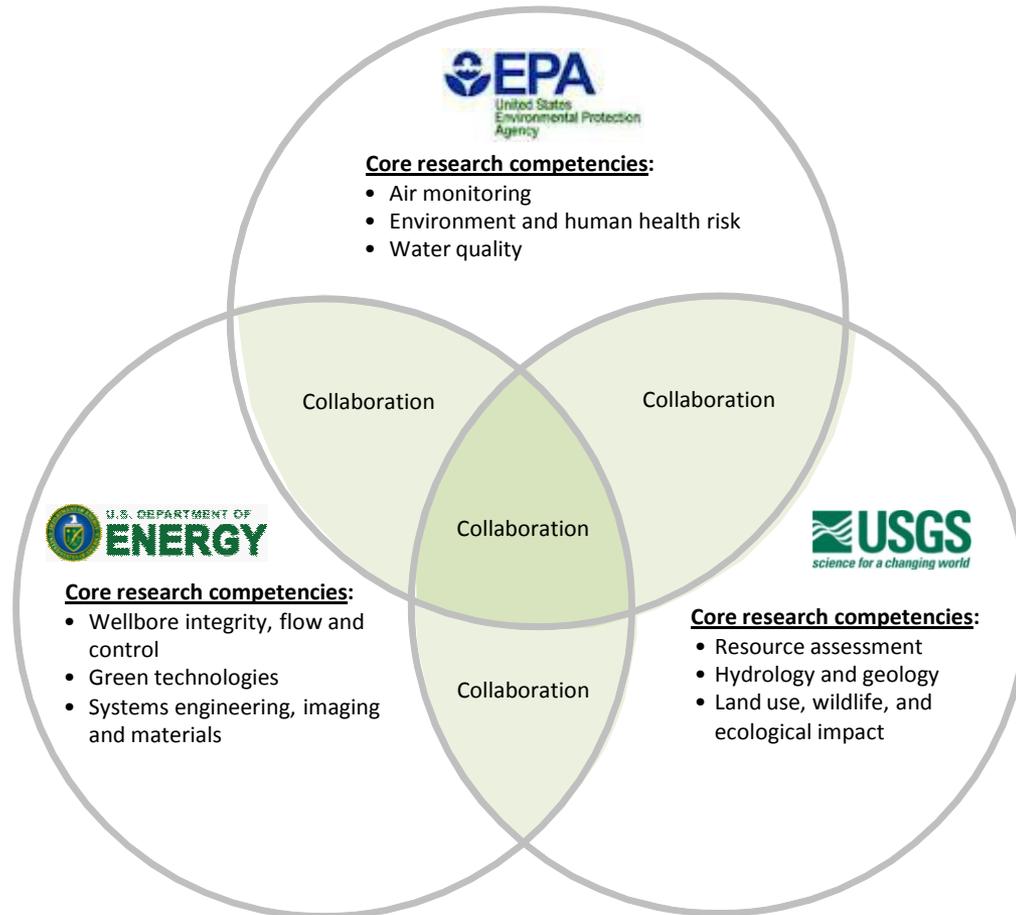
# Multi-Agency Committee Members

## Steering Committee:

- Christopher Smith, DOE (Chair)
- George Guthrie, DOE (NETL)
- Elizabeth Klein, DOI
- David Russ, DOI (USGS)
- Robert Sussman, EPA
- Kevin Teichman, EPA
- Kevin Hurst, OSTP

In addition to the Steering Committee, a technical subcommittee has been formed comprised of 18 scientists and engineers from the three agencies with expertise in a wide range of research areas.

# Agency Core Research Competencies



# Potential Research Plan Areas

- Enabling Prudent Development
- Water Quality
- Water Quantity
- Air Quality and Greenhouse Gas Emissions
- Ecological Effects
- Human Effects
- Induced Seismicity

# Tools for Resource Characterization

- Develop improved reservoir characterization and reservoir-to-basin scale geologic/engineering/economic tools and science
- Such play-specific information/tools and science would enable an improved basis of understanding the geographic variability and scale of potential risks over a variety of time-scales, as well as an improved basis for resource-management approaches that minimize potential for environmental impacts

# Water Quality

- Conduct research to understand the potential near-term and long-term water quality impacts of unconventional oil and gas production on surface and groundwater resources.
- This research could address the implications of pollutants associated with hydrocarbon production and waste by-products interfacing with water resources, including research on pollutant measurement and modeling to understand fate, transport, and migration in surface water and groundwater, and related effects of hydrogeologic structures and geochemical processes.
- This research could also study technical mitigation options to ensure water quality.

# Water Quantity

- Understand water availability and consumptive use of surface and groundwater resources for multiple uses as unconventional oil and gas production increases.
- Research under this topic could address technical and data challenges with monitoring water withdrawals associated with increased oil and gas industrial activity and technical mitigation options (e.g. reuse, use of alternative water sources including brackish water).

# Air Quality and Greenhouse Gas Emissions

- Identify and monitor unconventional oil and gas production's potential impact on air quality and greenhouse gas emissions.
- This topic would aim to improve scientific understanding of the rate of generation and fate of air pollutants that contribute to regional air quality hazards and climate change – including stakeholder partnerships that support improved monitoring, measurement protocols, data analysis, and control.

# Ecological Effects

- Identify and monitor potential ecological impacts associated with unconventional oil and gas production activities.
- This research could address the impacts of cumulative changes in land use, hydrology, and water and air quality on ecological resources including ecosystem services, wildlife, aquatic ecology, designated uses, and threatened and endangered species.

# Human Effects

- Understand the potential cumulative impacts on human health of increasing concentrations of and exposures to pollutants associated with unconventional oil and gas production and on communities in the regions where production is occurring.
- This research topic builds upon air and water quality research (a) to assess potential human health effects and risks, and (b) combined with resource availability research, to understand and monitor potential environmental health risks that are realized at a regional scale.
- Research on topics relating to socioeconomic impacts and benefits; public health outcomes; epidemiology; safety, visual, noise, and light pollution; infrastructure and cultural impacts; and risk perception and communication that could inform local decision-makers on the implications of unconventional oil and gas production in their communities.

# Induced Seismicity

- Research to understand the potential induced seismicity risk associated with unconventional oil and gas production activities.
- This research could address how hydraulic fracturing and related oil and gas production activities, such as wastewater disposal, may contribute to induced seismic hazards, the potential for predictive tools and hazard assessment methodologies, and best practice techniques or standards to reduce seismic risks.

# Discussion Questions

- Are there other potential research areas that should be considered?
- In each of the seven potential research areas, what are the most important research questions that can be addressed...
  - in the short-term?
  - in the long-term?
- What would the most useful research products be...
  - in the short-term?
  - in the long-term?
- What research is your organization pursuing, and how do you intend to share your research results?

# Thank You for Participating

To provide additional information  
to the Steering Committee,  
please send your comments to:

[unconventional@hq.energy.gov](mailto:unconventional@hq.energy.gov)

In addition, a website has been set up  
if you wish to follow this effort:

unconventional.energy.gov  
(no www)