

Shale Energy Resources Alliance (SERA)

Mission

To support the environmentally and socially sustainable development of shale resources through collaborative research and development among industry, university, and government partners on: resource characterization; drilling and extraction technology; near-term and cumulative environmental and social impacts; and empirically supported policy.

To achieve this mission, SERA conducts research on key areas related to shale energy development, develops and demonstrates technologies supporting the environmentally sustainable development of shale energy resources, serves as a repository of data regarding shale energy resources and environmental effects, and promotes dialogue among stakeholders.

Vision

A world in which global supplies of shale resources are developed economically, while promoting environmental sustainability.



An NETL-RUA researcher filters a water sample from drilling site.



A produced water pond at one of the NETL-RUA's industry partner sites.

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NETL-RUA PARTNERS

Carnegie Mellon University
Penn State
University of Pittsburgh
URS Corporation
Virginia Tech
West Virginia University

Key Activities

SERA realizes its mission through the following core activities:

- Advancing the fundamental science of shale gas resources and extraction, focusing on air quality, water resources (sources, effects on, and treatment and disposal of produced water), and geology;
- Developing and demonstrating advanced technologies to support environmentally sustainable shale gas production;
- Serving as a repository of data for activities related to shale gas exploration; development, and effects while publishing peer-reviewed research based on those data; and
- Promoting information exchange among shale gas producers and suppliers, researchers, non-governmental organizations, and the public.

Overview of Planned Research

Air Emissions

Research in this area will advance the state of the art in regional air quality modeling and lifecycle greenhouse gas (GHG) assessment as it relates to the development of shale gas resources. The results will: (1) provide a basis for local, regional, state, and federal decision makers to take positive actions to improve air quality; (2) identify opportunities for technology to reduce emissions from shale gas development and operations; and (3) provide a scientific basis for estimating the potential reductions in GHGs from employing shale gas resources.



Boom-mounted magnetometers identifying abandoned wells for drilling companies.

Water – Sourcing and Disposal

This research seeks to establish SERA as a single resource that evaluates the costs and performance of the various water management options for the shale energy sector. Water resources to support development of shale gas resources can be constrained. Costs related to various treatment options range from manageable to exorbitant and can seriously affect the economics of a given well. While many treatment technologies are available on the market, there are many that are unproven in the shale gas context. Finally, the effect of shale gas development on regional hydrogeology is an area of key interest.

Shallow Stray Gas

Shallow stray gas in the Marcellus formation has been a common safety concern for many stakeholders. Potential sources of the gas include operating or abandoned gas wells, active or inactive deep mines, permitted or un-permitted landfills, natural gas pipelines, or microbial gas generated in the shallow subsurface. This research supports the NETL-RUA Shale Gas SGA program goals and objectives by evaluating whether naturally forming gas can affect groundwater aquifers, determining the extent and magnitude of gas migration along wellbores, and providing solutions to prevent gas flow in the wellbore from shallow gas formations.



An NETL-RUA researcher samples groundwater at a Marcellus site.



NETL's mobile air monitoring laboratory at shale drill site in the Marcellus formation.