

May 23, 2013

**The United States Senate, Committee on Energy and Natural Resources
*Full Committee Forum: Shale Development-Environmental Protection and
Best Practices***

**Opening Comments of Alan Crain,
Senior Vice President and Chief Legal and Governance Officer**

Mr. Chairman, Senator Murkowski, Members of the Committee, good morning. I am Alan Crain, Senior Vice President, Chief Legal and Governance Officer of Baker Hughes Incorporated. I thank you for the great honor of appearing before you today.

Baker Hughes is a leading supplier of oilfield services, products, systems and technology to the worldwide oil, natural gas and geothermal industries. While we work in nearly 80 countries, approximately half of our more than 58,000 employees are based here in the United States, where we conduct the majority of our manufacturing, field services, and research and development.

I know that this Committee is well aware of the revolutionarily positive effect that advanced exploration and production technologies have had on the energy profile of our country. To support those technologies, Baker Hughes invests hundreds of millions of dollars in capital here in the U.S., investment that signals our faith in the long-term potential of these domestic resources. As shale gas development has grown, we have created thousands of new jobs, especially in the United States, and many of those are highly technical. In 2012 alone we hired nearly 500 new engineers and scientists at our U.S. facilities.

We support the goals of this Committee, including the maximization of the economic and environmental benefits of the nation's natural gas reserves. This is both commendable and achievable. It is a goal shared by Baker Hughes and our thousands of U.S. employees.

We believe that the key to advancing this goal is more information. Much of the public concern regarding shale development has been tied to hydraulic fracturing. The consensus among most states and in most of the federal government is that hydraulic fracturing has been and continues to be done in a safe and environmentally protective manner. All of us must do a better job of

explaining how natural gas is found and produced from shale and how the robust regulatory framework that exists mitigates potential risks. We also need to ensure that the public has meaningful information about these operations.

The potential impacts of hydraulic fracturing derive primarily from the surface activities. As a result, we know that these challenges are not unique and insurmountable; they are conventional and solvable.

Baker Hughes has extensive standard operating procedures to ensure that our workers are properly trained, that the equipment used to transport, store and pump fracturing fluid is in good condition, and that transportation and pumping operations are conducted safely. While long-established, these procedures are regularly updated to take into account technological developments and better practices identified and shared across the industry. In addition, we've just broken ground on a new Western Hemisphere Education Center near Houston, Texas that will facilitate our ongoing commitment to providing our workers with an integrated, world-class education. This Center consolidates our existing programs with workshops, applied training, hands-on simulation, and applied theory to ensure the continuing technical education of our growing workforce.

As the scale and geographic reach of these operations have expanded, the industry and regulators have taken steps to ensure that the shale revolution is sustainable. Over the past three years Baker Hughes has spent on average close to half a billion dollars annually on research and development. Increasingly, product improvement is geared to reducing the environmental footprint of shale development—be it using natural gas to power the engines of our trucks, creating environmentally-preferable chemical inputs, or developing new and better ways to recycle produced water and conserve freshwater.

Sustainable chemistry has long been an emphasis for Baker Hughes in this area. In 2010, we developed and published the first chemical evaluation framework dedicated to the continuous improvement of hydraulic fracturing chemistry. We're currently expanding this effort across our entire portfolio.

Baker Hughes supports the public disclosure of chemical ingredients used during the hydraulic fracturing process as an achievable policy goal. In our sector, we were one of the earliest and

largest supporters of FracFocus, the chemical disclosure registry. We designed an automated disclosure system that allows our customers to comply with any state disclosure rule or make voluntary disclosures in a format that does not jeopardize our and our suppliers' proprietary information. This process ensures that employees, government, the public and emergency responders all have ready access to important chemical information.

Finally, we have provided extensive information to EPA to support its study of hydraulic fracturing, including detailed, confidential data on our formulations so the Agency could better understand the context in which these products are used. Then, we worked with EPA to ensure that it was able to disclose all of the chemical ingredients that Baker Hughes shared. We have provided similar information to various state governments, both by rule and to support environmental studies. We were happy to participate in the Department of the Interior's forum that inaugurated the ongoing BLM rulemaking.

These commitments have grown alongside our investments in new technologies, facilities and people, all of which express our dedication to maintaining operational excellence in shale development.

I recognize that this forum is an important new undertaking in this area, and thank you again for the honor of participating today.