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May 16, 2011

BY ELECTRONIC MAIL ONLY

J. Barton Seitz

Mr. Edward Hanlon
Designated Federal Officer
EPA Science Advisory Board Staff Office (1400R)
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N. W.
Washington, DC 20460

Re: Comments of Halliburton Energy Services, Inc. on the
U.S. Environmental Protection Agency Science Advisory Board
Hydraulic Fracturing Study Plan Review Panel's
Draft Recommendations for the Hydraulic Fracturing Study Plan

Dear Mr. Hanlon:

In response to the Science Advisory Board's April 21, 2011 Federal Register Notice, 76 Fed. Reg. 22,394 [FRL-9298-6], please find attached the written comments of Halliburton Energy Services, Inc. (HESI) on the Draft Recommendations for the Hydraulic Fracturing Study Plan prepared by the Board's Hydraulic Fracturing Study Plan Review Panel. These comments have been signed on behalf of HESI's Assistant General Counsel, Stuart Kemp.

Thank you for your assistance

Respectfully,

BAKER BOTTS, L.L.P.

By: J. Barton Seitz
Of Counsel to Halliburton Energy Services, Inc.

JBS:jmd
Enclosure

Comments of Halliburton Energy Services, Inc.

**Draft Recommendations of Science Advisory Board Hydraulic Fracturing
Study Plan Panel Review of U.S. Environmental Protection Agency's
Draft Hydraulic Fracturing Study Plan**

May 16, 2011

I. Introduction

Halliburton Energy Services, Inc. (“HESI”) welcomes the opportunity to submit these comments to the Science Advisory Board (“SAB”) regarding the draft advice and recommendations of the SAB Hydraulic Fracturing Study Plan Review Panel (“SAB Draft Recommendations”) for the U.S. Environmental Protection Agency’s (“EPA’s”) Draft Hydraulic Fracturing Study Plan (“Draft Study Plan”).

As a leading provider of hydraulic fracturing services to the oil and gas industry with broad-based experience in performing hydraulic fracturing operations at hundreds of thousands of wells over the course of the past 60 years, HESI is particularly well-qualified to comment on the Agency’s proposed study of hydraulic fracturing (the “Study”). We respectfully request that HESI’s comments be included in the Agency’s administrative record for the Study and considered by the SAB in finalizing its recommendations on the Draft Study Plan.

II. General Comments

A. The SAB has properly recommended a limited scope for EPA’s Study.

HESI applauds the SAB for acknowledging the constraints on EPA resources and time. As the SAB noted in its draft recommendations, these time and budgetary limitations call for a targeted study focused on the most important issues.¹ First and foremost, just as Congress

¹ SAB, Draft Recommendations Regarding Review of EPA’s Draft Hydraulic Fracturing Study Plan, at 3, 21 (April 28, 2011) (“SAB Draft Recommendations”).

directed, the Study should solely address the potential relationship between the fracturing process and drinking water exposures for human health.²

In addition, in light of the time and resource constraints, HESI supports the SAB's recommendation that EPA adopt a traditional risk assessment approach for assessing and prioritizing research activities for each stage of the water lifecycle presented in the Draft Study Plan.³ HESI agrees with the SAB that a traditional risk assessment approach will focus the study efforts on "critical research questions" and goals that can be realistically achieved.⁴ Moreover, adopting a traditional approach that focuses on potential drinking water exposure pathways — as the SAB has recommended — will help EPA satisfy the congressional mandate and address the principal congressional concerns giving rise to the Study, i.e., potential impacts to drinking water.

For similar reasons, HESI also supports the SAB's recommendation that EPA should synthesize, rely upon and use existing data on hydraulic fracturing and its potential effects on drinking water resources. Indeed, there is wealth of valuable data regarding industry best management practices, existing industry studies of well drilling and hydraulic fracturing, and numerous technical articles published by the Society of Petroleum Engineers and other

² The proposed Study is being conducted in response to the following express directive from Congress:

Hydraulic Fracturing Study. — The conferees urge the Agency to carry out a study on the relationship between hydraulic fracturing and drinking water, using a credible approach that relies on the best available science, as well as independent sources of information. The conferees expect the study to be conducted through a transparent, peer-reviewed process that will ensure the validity and accuracy of the data. The Agency shall consult with other Federal agencies as well as appropriate State and interstate regulatory agencies in carrying out the study, which should be prepared in accordance with the Agency's quality assurance principles.

See H. Rept. 111-316, U.S. House of Representatives Conference Report, Fiscal Year 2010 Department of the Interior, Environment, and Related Agencies Appropriation Act at 109 (111th Congress, Oct. 28, 2009).

³ SAB Draft Recommendations at 6.

⁴ *Id.* at 3, 34.

petrochemical publications that should be incorporated into the Agency's Study.⁵ HESI agrees that the use of such existing information will enable EPA to answer many of the broad research questions it has included in the Draft Study Plan.

B. The SAB should recommend that EPA use realistic assumptions and reliable data.

While supporting the foregoing aspects of the SAB's draft report, HESI also believes that the SAB should still specifically recommend that EPA's Study be based on realistic assumptions and reliable scientific data that accurately reflect current industry practices involving hydraulic fracturing. These recommendations are essential for assuring that the Study uses "a credible approach that relies on the best available science" as directed by Congress, and are particularly important for the Study proposals involving (i) risk assessment, (ii) case studies, and (iii) modeling, as described below.

Risk assessment approach.

As noted above, HESI supports the SAB's recommendation that EPA use a traditional risk assessment approach for the Study – using the process steps of toxicity evaluation, exposure assessment and risk characterization.⁶ At the same time, HESI requests that the SAB advise EPA to explicitly define the realistic exposure scenarios and fundamental assumptions that will be used in the risk assessment. This assessment should be based on the most up-to-date oil and gas industry operational practices and work management requirements, and acknowledge that

⁵ The SAB's draft recommendations already include references to a number of these important sources of information (*see id.* at 8, 22, 25-29), as did HESI's prior comments to the SAB. *See Comments of Halliburton Energy Services, Inc., U.S. Environmental Protection Agency Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources*, 10-12 (March 3, 2011) ("HESI Comments")

⁶ SAB Draft Recommendations at 6. *See also* HESI Comments at 8-9 (recommending that the Study Plan take into account substantial existing evidence demonstrating that hydraulic fracturing fluids have limited or no completed pathways of human exposure). In contrast to the SAB's recommendations, HESI has noted recent statements from the EPA Assistant Administrator for Research and Development that the Study is not intended to be a risk assessment. Even if EPA does not conduct a formal risk assessment, the Study still should be guided by recognized risk assessment principles consistent with the Agency's guidance.

human exposures to hydraulic fracturing fluids are actually quite limited under typical industry operations and use condition. In addition, HESI recommends that EPA's risk assessment apply the methodology and assumptions already used by Gradient to perform a similar 2009 study of the potential drinking water risks from hydraulic fracturing operations, a copy of which was previously submitted to the SAB and EPA⁷

Case studies.

In a similar manner, the SAB should recommend that EPA engage in improved partnering with the oil and gas industry and rely on current best management practices for the Agency's proposed case studies. In HESI's view, these approaches could effectively overcome the SAB's concerns that the proposed case studies may not be sufficiently representative of regional variations in hydraulic fracturing operations and industry practices.⁸ In fact, by relying on industry management practices – including those developed by the American Petroleum Institute (“API”)⁹ – and “mining” the richer sets of data maintained by State agencies, the Agency could derive more robust inferences that span a wider range of hydraulic fracturing site conditions and management practices. HESI would welcome the opportunity to engage in further discussions with the Agency to ensure that realistic industry practices and diverse geologic and geographic characteristics are accurately addressed during the Agency's case study process.

⁷ Gradient, *Human Health Risk Evaluation for Hydraulic Fracturing Fluid Additives Marcellus Shale Formation*, New York at 14 (Dec. 31, 2009).

⁸ SAB Draft Recommendations at 35.

⁹ See, e.g., API, *Guidance Document HF1, Hydraulic Fracturing Operations – Well Construction and Integrity Guidelines* (1st Ed. 2009); API, *Guidance Document HF2, Water Management Associated with Hydraulic Fracturing* (1st Ed. 2010); API, *Guidance Document HF3, Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing* (1st Ed. 2011).

Modeling.

Furthermore, any modeling conducted by EPA should clearly be based on valid assumptions and reliable data in order to assure that any such modeling reflects real-world conditions. Indeed, the SAB has recognized that model-simulated outcomes are strongly dependent on assumptions and choices made about how to represent the physical system being modeled.¹⁰ HESI requests that the SAB more clearly acknowledge the limitations of any modeling approach and instead suggest that EPA use existing quantifiable data for performing its Study.

C. The SAB should advise EPA to fully address current state regulatory regimes in the Study.

Despite the prior comments from numerous industry members, the SAB has made no specific recommendation with respect to the current state regulatory programs for oil and gas drilling operations and how such programs may affect the likelihood of any potential impacts from hydraulic fracturing operations. The SAB's omission of any such recommendation is of particular concern because the Draft Study Plan suggests that the Agency is not intending to consider these state programs as part of the Study efforts. HESI believes that it would be essential for the Agency to consider and incorporate these state programs into its Study because they establish effective regulatory controls, up-to-date best management practices and related measures for drilling and fracturing operations.¹¹

¹⁰ SAB Draft Recommendations at 8, 55.

¹¹ In fact, in the past several years, a number of key oil- and gas-producing states have taken further steps to strengthen existing state regulations in order to incorporate updated best practices for well construction and hydraulic fracturing operations. For example, in 2008 the Colorado Oil and Gas Conservation Commission promulgated amended rules that included extensive requirements on well construction standards, water protection and waste management. Similarly, during 2010 the Pennsylvania Department of Environmental Protection adopted a comprehensive update to its oil and gas regulations to specify additional requirements for well design, construction practices, gas migration prevention, and hydraulic fracturing.

D. Given the significant time and resource limitations, the SAB should not call for an expansion of the Study beyond the Congressional mandate.

As noted above, the SAB has urged that the Study scope be limited due to EPA's time and budgetary restraints for the Study. Nevertheless, despite the recognized need to focus the Study on key issues, the SAB is recommending expanded research efforts in areas that reach well beyond the congressional directive for the Study. HESI requests that the SAB reconsider these recommendations, particularly with respect to the proposed research involving (i) water acquisition and use, (ii) wastewater treatment, and (iii) air contaminants.

Water acquisition and use.

Contrary to its own recommendations to limit the Study scope, the SAB has proposed that EPA should "take a broader view" on water acquisition research and consider hydraulic fracturing impacts on water flows in the surrounding hydrological cycle.¹² As HESI previously commented, water acquisition research generally, and certainly the SAB's recommended expansions of water acquisition research to include issues such as "environmental flows," should not be a priority in EPA's Study.¹³

For similar reasons, the SAB should withdraw its suggestion that EPA (i) consider groundwater with total dissolved solids ("TDS") greater than 10,000 milligrams per liter ("mg/L") as a potential drinking water supply, and (ii) not limit an assessment of groundwater impacts solely to exceedances of the Maximum Contaminant Levels ("MCLs") established under the federal Safe Drinking Water Act ("SDWA").¹⁴ These SAB recommendations are contrary to

¹² SAB Draft Recommendations at 1, 7, 13-14.

¹³ HESI Comments at 3-4.

¹⁴ SAB Draft Recommendations at 30, 32. In addition, in its Executive Summary, the SAB recommends that the following constituents be included as part of an expanded list of analytes to be studied: "hydrogen sulfide, ammonium, radon, iron, manganese, arsenic, selenium, total organic carbon, and bromide in addition to HF fluid constituents and likely formation chemicals (e.g. benzene, toluene, ethylbenzene, and xylenes - BTEX, surfactants and biocides)." *Id.* at 4. For the reasons discussed above, HESI believes that the SAB's proposal would unnecessarily expand the Agency's Study to address water acquisition issues beyond Congress's targeted Study

(continued)

established federal regulatory standards and would expand the Study well beyond Congress' directive. Indeed, the SDWA provides a regulatory scheme for the protection of "underground sources of drinking water,"¹⁵ which the Agency has expressly defined as waters that "*contain fewer than 10,000 mg/l total dissolved solids.*"¹⁶

Wastewater treatment.

Despite the SAB's concerns about the limited scope and timing for the Study, the Board has recommended that EPA determine "[w]hat is the appropriate treatment of hydraulic fracturing wastewater. . ."¹⁷ Any research concerning the effectiveness of current treatment methods for produced water would not yield relevant information regarding the relationship between hydraulic fracturing and drinking water. Consequently, any such analysis would reach beyond the congressional scope for the Study.

Air contaminants.

Moreover, the SAB has confusingly suggested that EPA "consider the potential release of volatile organic contaminants and other contaminants to the air . . . (which) could potentially result in contamination of water supply sources," even though the SAB has acknowledged that "expanding the study to include air is not within the scope of this document."¹⁸ As recognized by the Agency in the Draft Study Plan, air impacts are beyond the scope of Congress' intent for the Study. Accordingly, HESI recommends that these air impact issues be removed from the SAB's final recommendations.

(continued)

mandate. Moreover, the SAB's recommendation is unclear because it inaccurately suggests that BTEX compounds, surfactants and biocides are "likely formation chemicals." *Id.* The SAB should clarify this statement.

¹⁵ 42 U.S.C. § 300f.

¹⁶ 40 C.F.R. § 144.3 (emphasis added).

¹⁷ SAB Draft Recommendations at 47.

¹⁸ *Id.* at 14.

III. Specific Technical Comments

In addition to the issues discussed above, HESI has a number of concerns with technical issues left unresolved or ambiguously referenced in the SAB's draft recommendations:

- **The SAB's draft recommendations fail to acknowledge that actual industry practices produce chemical mixtures in dilute form.** As HESI previously commented, EPA's chemical mixing research should focus on realistic scenarios involving chemical mixtures in a dilute form that are representative of actual industry practices. Specifically, HESI requests that the SAB urge the Agency to utilize typical diluted (or water and proppant-blended) concentrations of hydraulic fracturing additives in the analysis in order to achieve realistic results within the risk assessment framework.¹⁹
- **The SAB should reconsider its assumptions regarding the use of flowback and produced waters for irrigation.** The use of untreated hydraulic fracturing flowback/produced water for irrigation²⁰ is implausible, and therefore Study resources should not be allocated to analyze this exposure pathway.
- **The SAB should expressly recommend that all proprietary and trade secret information that the Agency receives from industry will remain confidential.** As noted in its prior comments to the SAB, HESI and other oil and gas companies have made substantial research and development investments in their proprietary hydraulic fracturing products. EPA should reaffirm that all proprietary and trade secret information provided to the Agency will be subject to the legal protections afforded to confidential business information under the federal EPA regulations at 40 C.F.R. Part 2, Subpart B.
- **The SAB's draft recommendations do not address Congress' express requirement that the Study adhere to the Agency's quality assurance and quality control requirements.** As HESI previously commented, one of Congress' express requirements for the proposed Study is that it "should be prepared in accordance with the Agency's quality assurance principles."²¹ HESI again requests that EPA's Study process should fully adhere to the Agency's quality assurance and quality control procedures that have been set forth in various applicable EPA guidance materials.²² Specifically, HESI requests that the Agency should assure that the Study will rely on substantiated data and be conducted in a fully transparent and balanced manner.²³

¹⁹ See HESI Comments at 18-19.

²⁰ SAB Draft Recommendations at 47.

²¹ U.S. Congress, *Fiscal Year 2010 Department of the Interior, Environment, and Related Agencies Appropriation Act*, H. Rept. 111-316 at 109 (111th Congress, Oct. 28, 2009).

²² See, e.g., EPA, *Guidance for Quality Assurance Plans*, EPA QA/G-5 (Dec. 2002), available at <http://www.epa.gov/QUALITY/qs-docs/g5-final.pdf>.

²³ HESI Comments at 22-23.

IV. Conclusion

HESI appreciates the opportunity to submit these supplemental comments on EPA's Draft Study Plan in response to the SAB's draft recommendations. HESI supports the SAB's recommendations for a more focused and narrowed Study that directs research activities toward the specific drinking water concerns behind Congress' mandate. At the same time, HESI respectfully requests that the SAB address the concerns HESI has outlined in these comments and provide necessary clarification in its final recommendations.

HESI looks forward to working with EPA on the continued design, execution, and review of the Agency's Study. If you have any questions regarding these comments, please do not hesitate to contact Stuart H. Kemp, Assistant General Counsel for Halliburton, at (713) 839-4539.