



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR  
SCIENCE ADVISORY BOARD

June 2, 2015

**MEMORANDUM**

**SUBJECT:** Addendum to the March 25, 2013 Memorandum: Formation of Science Advisory Board Hydraulic Fracturing Research Advisory Panel

**FROM:** Edward J. Hanlon */signed/*  
Designated Federal Officer (DFO)  
EPA Science Advisory Board Staff Office (1400R)

**THRU:** Wanda Bright */signed/*  
SAB Ethics Officer  
EPA Science Advisory Board Staff Office (1400R)

**TO:** Thomas H. Brennan  
Deputy Director  
EPA Science Advisory Board Staff Office (1400R)

On March 25, 2013 the Science Advisory Board (SAB) Staff Office Director signed a memorandum that announced to the public the members of the SAB's Hydraulic Fracturing Research Advisory Panel. The memorandum provided a set of determinations that were necessary for forming the SAB Panel, and described all relevant information considered in forming the Panel, including a review of the confidential financial disclosure forms and evaluation of an appearance of a lack of impartiality. Since March 25, 2013, the SAB Staff Office has received additional information regarding membership of the Hydraulic Fracturing Research Advisory Panel. Based on review of this additional information, the members of the SAB Hydraulic Fracturing Research Advisory Panel are as follows:

## **Hydraulic Fracturing Research Advisory Panel Members**

Dr. David A. Dzombak, Carnegie Mellon University (PA), CHAIR  
Dr. Stephen W. Almond, Fritz Industries, Inc. (TX)  
Dr. E. Scott Bair, Ohio State University (OH)  
Dr. Peter Bloomfield, North Carolina State University (NC)  
Dr. Steven R. Bohlen, State of California Department of Conservation (CA)  
Dr. Elizabeth W. Boyer, Pennsylvania State University (PA)  
Dr. Susan L. Brantley, Pennsylvania State University (PA)  
Dr. James V. Bruckner, University of Georgia (GA)  
Dr. Thomas L. Davis, Colorado School of Mines (CO)  
Dr. Joseph J. DeGeorge, Merck Research Laboratories (PA)  
Dr. Joel Ducoste, North Carolina State University (NC)  
Dr. Shari Dunn-Norman, Missouri University of Science and Technology (MO)  
Dr. Katherine Bennett Ensor, Rice University (TX)  
Dr. Elaine M. Faustman, University of Washington (WA)  
Mr. John V. Fontana, Vista GeoScience LLC (CO)  
Dr. Daniel J. Goode, United States Geological Survey (PA)  
Dr. Bruce D. Honeyman, Colorado School of Mines (CO)  
Mr. Walter R. Hufford, Talisman Energy USA Inc. - REPSOL (PA)  
Dr. Richard F. Jack, Thermo Fisher Scientific Inc. (CA)  
Dr. Dawn S. Kaback, Amec Foster Wheeler (CO)  
Dr. Abby A. Li, Exponent Inc. (CA)  
Mr. Dean Malouta, White Mountain Energy Consulting, LLC (TX)  
Dr. Cass T. Miller, University of North Carolina (NC)  
Dr. Laura J. Pyrak-Nolte, Purdue University (IN)  
Dr. Stephen J. Randtke, University of Kansas (KS)  
Dr. Joseph N. Ryan, University of Colorado Boulder (CO)  
Dr. James E. Sainers, Yale University (CT)  
Dr. Azra N. Tutuncu, Colorado School of Mines (CO)  
Dr. Paul K. Westerhoff, Arizona State University (AZ)  
Dr. Thomas M. Young, University of California, Davis (CA)

Concurred,

/Signed/

Thomas H. Brennan  
Deputy Director,  
EPA Science Advisory Board Staff Office

June 2, 2015

Date



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OFFICE OF THE ADMINISTRATOR  
SCIENCE ADVISORY BOARD

March 25, 2013

**MEMORANDUM**

**SUBJECT:** Formation of Science Advisory Board Hydraulic Fracturing Research Advisory Panel

**FROM:** Edward Hanlon /Signed/  
Designated Federal Officer (DFO)  
EPA Science Advisory Board Staff Office (1400R)

**THRU:** Wanda Bright /Signed/  
SAB Ethics Officer  
EPA Science Advisory Board Staff Office (1400R)

**TO:** Christopher S. Zarba  
Acting Director  
EPA Science Advisory Board Staff Office (1400R)

In its Fiscal Year 2010 Appropriation Conference Committee Directive to EPA, the U.S. Congress approved a provision that urged EPA to conduct analyses to assess the potential risks to drinking water posed by hydraulic fracturing of formations including coalbeds and shale for extraction of natural gas. To meet the Congressional request, EPA's Office of Research and Development (ORD) developed approaches for gathering existing data and information including a stakeholder input process; cataloging potential risks to drinking water supplies from hydraulic fracturing; identifying data gaps; and developing research questions, research needs, and research products. In December 2012, ORD released a *Progress Report: Potential Impacts of Hydraulic Fracturing on Drinking Water Resources* that describes the status of its research on the potential environmental and human health implications of hydraulic fracturing with special emphasis on the relationship between hydraulic fracturing and drinking water resources.

ORD requested a consultation of the status of the research described in its Progress Report. The panel will also provide advice and peer review on other EPA technical documents and issues related to hydraulic fracturing upon further request by EPA.

This memorandum addresses the set of determinations that were necessary for forming the SAB Hydraulic Fracturing Research Advisory Panel, including:

- (A) The type of review body that will be used to conduct the review, and the nature of the review;
- (B) The list of candidates to be considered for the Panel;
- (C) Financial conflict of interest considerations, including identification of parties who are potentially interested in or may be affected by the topic to be reviewed;
- (D) How regulations concerning “appearance of a loss of impartiality,” pursuant to 5 C.F.R. § 2635.502, apply to members of the Panel; and
- (E) The selection of Panel members.

**DETERMINATIONS:**

- (A) The type of review body that will be used to conduct the review, and the nature of this review.

An *ad hoc* panel, composed of subject matter experts, will be formed under the auspices of the Science Advisory Board to provide advice and recommendations to EPA on its research on the potential environmental and human health implications of hydraulic fracturing with special emphasis on the relationship between hydraulic fracturing and drinking water resources.

- (B) The list of candidates to be considered for the Panel.

The SAB Staff Office sought in a *Federal Register* Notice (Volume 77, Number 162, Pages 50505 – 50506) published on August 21, 2012 public nominations of nationally and internationally recognized scientists and engineers having experience and expertise related to hydraulic fracturing, including but not limited to the following disciplines or areas of experience: natural gas and petroleum engineering and geology; natural gas and petroleum well drilling, completion, testing, and closure; hydrology/ hydrogeology; groundwater and surface water fate/transport modeling; geochemistry and analytical chemistry; environmental monitoring; conducting laboratory and/or field-based research in hydraulic fracturing; human health effects and risk assessment; civil and environmental engineering; chemical engineering; drinking water and waste water treatment systems; water quality; and statistics.

Candidates for the Hydraulic Fracturing Research Advisory Panel were either nominated by the public in response to the *Federal Register* Notice or were identified and contacted by the SAB Staff Office based on their relevant expertise. The SAB Staff Office received 75 nominations of experts from the public to the *Federal Register* notice. The SAB Staff Office identified additional expert candidates through independent research, recommendations from former members of SAB Panels and Committees, and recommendations from members of professional societies, other federal agencies, non-government organizations, and other contacts identified by the SAB Staff Office.

The SAB Staff Office identified one hundred forty-four (144) candidates based on their relevant expertise and willingness to serve. On November 27, 2012, the SAB Staff Office invited public comments by December 19, 2012 on the List of Candidates for the Panel. The SAB Staff Office received 139 public comments on the candidate list. The public commenters and their affiliations are listed in Attachment 1 to this memorandum.

(C) Financial conflict of interest considerations, including identification of parties who are potentially interested in or may be affected by the topic to be reviewed.

(a) Identification of parties who are potentially interested in or may be affected by the topic to be reviewed: The principal interested and potentially affected parties for this topic may include: (1) federal, state, and local government agencies, elected officials, and non-government organizations involved in the development or implementation of policies or regulations related to hydraulic fracturing; (2) the water pollution research community; (3) energy production and transmission industries, including the oil and gas industry; and (4) those involved with the interests of private or public organizations that may be affected by policies or regulations developed on the basis of EPA's research on the potential environmental and human health implications of hydraulic fracturing with special emphasis on the relationship between hydraulic fracturing and drinking water resources.

(b) Conflict of interest considerations: For Financial Conflict of Interest (COI) issues, the basic 18 U.S.C. § 208 provision states that: "An employee is prohibited from participating *personally and substantially* in an official capacity in any *particular matter* in which, to his knowledge, he or any person whose interests are imputed to him under this statute has a *financial interest*, if the particular matter will have a *direct and predictable effect* on that interest [emphasis added]." For a conflict of interest to be present, all elements in the above provision must be present. If an element is missing, the issue does not involve a formal conflict of interest; however, the general provisions in the appearance of impartiality guidelines must still apply and need to be considered.

In addition, the following section of the CFR discusses requirements for disqualifying financial interests that arise from the ownership by the employee, his spouse or minor children of securities issued by one or more entities affected by the matter under consideration by the Panel:

5 CFR 2640.202(c) *De minimis* exemption for matters of general applicability.

(1) An employee may participate in any particular matter of general applicability...in which the disqualifying financial interest arises from the ownership by the employee, his spouse or minor children of securities issued by one or more entities affected by the matter, if:

(i) The securities are publicly traded, or are municipal securities, the market value of which does not exceed:

- (A) \$25,000 in any one such entity; and
- (B) \$50,000 in all affected entities; or

(ii) The securities are long-term Federal Government securities, the market value of which does not exceed \$50,000.

(2) For purposes of this paragraph (B), the value of securities owned by the employee, his spouse, and minor children must be aggregated in applying the exemption.

(i) Does the general charge to the SAB Hydraulic Fracturing Research Advisory Panel involve a particular matter? A “particular matter” refers to matters that “...will involve deliberation, decision, or action that is focused upon the interest of specific people, or a discrete and identifiable class of people.” It does not refer to “...consideration or adoption of broad policy options directed to the interests of a large and diverse group of people.” [5 C.F.R. § 2640.103 (a)(1)]. A particular matter of general applicability means a particular matter that is focused on the interests of a discrete and identifiable class of persons, but does not involve specific parties [5 C.F.R. § 2640.102(m)]. Additionally, 5CFR 2637.102(a)(7) defines a particular matter involving specific parties to mean any judicial or other proceeding, application, request for ruling or other determination, contract, claim, controversy, investigation, change, accusation, arrest or other particular matter involving a specific party or parties in which the United States is a party or has a direct and substantial interest.

The activity of the SAB Panel in addressing the charge for review of EPA’s research on the potential environmental and human health implications of hydraulic fracturing with special emphasis on the relationship between hydraulic fracturing and drinking water resources qualifies as a *particular matter of general applicability* because the resulting advice will be part of a deliberation, and under certain circumstances the advice could involve the interests of a discrete and identifiable class of people but does not involve specific parties. That class of people constitutes those who are involved with private or public organizations facing regulatory decisions related to hydraulic fracturing, and those who are associated or involved with the potentially interested or affected parties, as identified in Section (C)(a) above.

(ii) Will there be personal and substantial participation on the part of the Panel members? Participating personally means direct participation in this review. Participating substantially refers to involvement that is of significance to the matter under consideration. [5 C.F.R. § 2640.103(a)(2)].

For this review, the SAB Panel members *will be participating personally in the matter*. Panel members will be providing the Agency with advice and recommendations on the potential environmental and human health implications of hydraulic fracturing with special emphasis on the relationship between hydraulic fracturing and drinking water resources. Such advice is expected to directly influence the Agency’s approach for assessing key research questions regarding the potential public health and environmental protection issues that may be associated with hydraulic fracturing. *Therefore, participation in this review also will be substantial.*

(iii) Will there be a direct and predictable effect on a Panel member's financial interest? A direct effect on a participant's financial interest exists if "...a close causal link exists between any decision or action to be taken in the matter and any expected effect of the matter on the financial interest. ...A particular matter does not have a direct effect ...if the chain of causation is attenuated or is contingent upon the occurrence of events that are speculative or that are independent of, and unrelated to, the matter. A particular matter that has an effect on a financial interest only as a consequence of its effects on the general economy is not considered to have a direct effect." [5 C.F.R. § 2640.103(a)(i)] A predictable effect exists if, "...there is an actual, as opposed to speculative, possibility that the matter will affect the financial interest." [5 C.F.R. § 2640.103(a)(ii)]

Candidates for the Panel were evaluated against the requirements of 5 C.F.R. § 2640.101(a), using each candidate's confidential financial disclosure form (EPA Form 3110-48), to determine whether the work of the Panel will have a direct and predictable effect on his or her financial interests.

(D) How regulations concerning "appearance of a loss of impartiality," pursuant to 5 C.F.R. § 2635.502, apply to members of the Panel

The Code of Federal Regulations at 5 C.F.R. § 2635.502(a) states that: "Where an employee knows that a particular matter involving specific parties is likely to have a direct and predictable effect on the financial interest of a member of his household, or knows that a person with whom he has a covered relationship is or represents a party to such matter, and where the person determines that the circumstances would cause a reasonable person with knowledge of the relevant facts to question his impartiality in the matter, the employee should not participate in the matter unless he has informed the agency designee of the appearance problem and has received authorization from the agency designee." Further, § 2635.502(a)(2) states that, "An employee who is concerned that circumstances other than those specifically described in this section would raise a question regarding his impartiality should use the process described in this section to determine whether he should or should not participate in a particular matter."

Candidates for the Panel were evaluated against the 5 C.F.R. 2635(a)(2) general requirements for considering an appearance of a loss of impartiality. Information used in this evaluation included: responses to the following questions (see below), and to EPA 3110-48 confidential financial disclosure forms, and public comment.

1. Have you had any previous involvement with EPA's efforts related to hydraulic fracturing research? If so, please identify and describe that involvement.
2. Have you served on previous advisory panels, committees or subcommittees that have addressed hydraulic fracturing or related topics under consideration? If so, please identify those activities.
3. Have you made any public statements (written or oral), including expert testimony (public hearing, litigation), concerning hydraulic fracturing that would indicate to an

observer that you have taken a position on the issue under consideration? If so, please identify those statements.

4. Please identify the current or previous (i.e., within the last 2 years) sources of any financial support for your work related to hydraulic fracturing, and the specific subject areas for such support.
5. Do you and your spouse have any financial interest in the oil and gas industry in excess of \$25,000 for any individual entity or \$50,000 for any aggregate?
6. Do you know of any reason that you might be unable to provide impartial advice on the matter to come before the panel/committee/subcommittee or any reason that your impartiality in the matter might be questioned (including financial conflicts)?

(E) The selection of Panel members

The SAB Staff Office Director makes the final decision about who serves on the SAB Hydraulic Fracturing Research Advisory Panel, based on all relevant information identified by SAB staff and public comment. This includes a review of the member's confidential financial disclosure form (EPA Form 3110-48) and an evaluation of an appearance of a loss of impartiality. For the SAB Staff Office, a balanced panel is characterized by inclusion of candidates who possess the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the charge to the panel. Specific criteria to be used in evaluating an individual panel member include: (a) scientific and/or technical expertise, knowledge, and experience; (b) availability and willingness to serve; (c) absence of financial conflicts of interest; (d) absence of an appearance of a loss of impartiality; (e) skills working on advisory committees and panels; and, (f) for the committee as a whole, diversity of scientific expertise and points of view.

In order to achieve a balance of points of view, the SAB Staff Office contacted several Panel candidates to assess their willingness to adjust their financial interests in the oil and gas industry to meet the 5 CFR 2640 requirements for serving as a special government employee on this Panel. Two members of the Panel did adjust their financial interests in the oil and gas industry in order to meet these 5 CFR 2640 requirements.



**Attachment 1: Public Comments on the List of Candidates for the SAB Hydraulic Fracturing Advisory Panel**

<b>Name</b>	<b>Affiliation</b>
Edith Allison	American Association of Professional Geologists
Jeanette Ammon	Self
Thomas S. Andersen	Shintech, Inc.
Lynn Anderson	Self
Jean Andrews	Self
Lori R. Babbey	Self
Scott A. Baker	Arkema, Inc.
Hannah Baxter	Self
Carol Beale	Self
Lauren Berlekamp	Self
Renee Bogue	Self
John F. Bolakas	Stantec Consulting Services, Inc.
Christine Borello	Stark Concerned Citizens, Plain Twp., OH
Mitchell D. Brouman	Field Environmental Instruments, Inc.
Darla Bruno	Self
Mary E. Buzby	Merck & Co., Inc.
Leah Cain	Self
Glenn Campbell	Self
Heather Cantino	Self
Neil E. Carriker	Tennessee Valley Authority
Lynn Chapman	Self
Brian J. Clark	Buchanan Ingersoll & Rooney, PC
Scott B. Cline	Self
Dennis Coleman	Isotech Laboratories, Inc.
H. DeWayne Corley	Self
Michael D. Crouch	TerraBase, Inc.
Linda E. Cummings	TEA, Inc.
Thomas Cvetkovich	Self
Tracy Dahl	Self
Gay Dalzell	Self
Julia Fuhrman Davis	Self
Valerie Dearing	Self
Patricia and Donald Denny	Self
Marchie Diffendorf	Broome County, NY Legislator
William G. Drelles	Self
Brad Droy	Toxicological & Environmental Associates, Inc.
Alice Dugar	Self
Marti Durbin	American Petroleum Institute
Honorable Anna G. Eshoo	Member of Congress of the United States, United States House of Representatives
Amy L. Farrell	America's Natural Gas Alliance
Bob Fedyski	Rural Action Sustainable Agriculture

Joe Ferry	NiSource, Inc.
Gwen B. Fischer	Self
Stanley L Fischer.	Self
Sherry Fleming	Self
Lawrence Scott Frankel	Self
Lee Fuller	Independent Petroleum Association of America
Paul S. Gardner	Paul S. Gardner Consulting
Vicki Garrett	Self
Richard A. Gerard	Self
Peter Gibbons-Ballew	Self
Gordon Giffin	McKenna, Long & Aldridge, LLP
Mary Sue Gmeiner	Self
Jimmy E. Goolsby	Self
Stephen Grant	Accutest Laboratories
Terrance Grimball	URS Corporation
Roxanne Groff	Self
Andrew J. Haar	Holly Refining & Marketing - Tulsa LLC
Michael Hagood	Cardno Entrix
Debra Hall	Self
Kathleen Hall	Self
John Hanger	Eckert, Seamans, Cherin & Mellot, LLC
Trish Harness	Self
Gary Harrington	Newfield Exploration Company
Chris Hawk	Penske Truck Leasing Co., L.P.
Jeff Heller	Self
Lloyd Hetrick	Newfield Exploration Company
Brent J. Hoffpauir	CITGO Petroleum Corporation
Honorable Michael M. Honda	Member of Congress of the United States, United States House of Representatives
Eric J. Hyman	Eric J. Hyman & Associates
Badger Johnson	Self
James H. Johnson	Self
Ani Karetka	Self
Debbie V.S. Kasper	Hiram College
Kirk Kessler	EPS
Steve Kirkwood	Kirkwood Oil and Gas
Kathryn Z. Klaber	Marcellus Shale Coalition
Abigail W. Koss	Environmental Standards, Inc.
Mark Kuhn	Self
Julie Lewis	Broome County, NY Legislator
Adam Lindner	Self
Honorable Thomas Lockhart	Member of Legislature of the State of Wyoming
Peter & Irene Maizitis	Self
Loraine McCosker	Self
C.W. McGlocklin	SKF USA Inc.
Angus McGrath	Stantec Consulting Services, Inc.

Honorable Matthew H. Mead	Governor of the State of Wyoming
Andrea Moore	Self
Briana Mordick	Natural Resources Defense Council
Carlos Moreno	Liskow & Lewis
Mary Ellen Noss	Self
Tish O'Dell	Self
Jeff Odhner	Odhner Holographics
David Olson	Accutest Gulf Coast
Tim Oostdyk	Eurofins Lancaster Laboratories, Inc.
Jeff Ostmeyer	Anadarko Petroleum Corporation
Greg Pace	Self
Tony Paone	Self
Landon Parr	BEM Systems, Inc.
Vanessa Pesec	Self
Pegge Petkovich	Self
Lara P. Phelps	U.S. Environmental Protection Agency
Thomas Pretlow	Case Western Reserve University
Ron Prosek	Network for Oil & Gas Accountability and Protection
Kathryn Rapose	Self
Edward G. Rendell	Self
Dorothy Richter	Hager-Richter Geoscience, Inc.
Karen Anne Riley	Laurel Mountain Midstream, LLC
Joe Roberts	Sunoco, Inc.
William J. Rogers	Tennessee Valley Authority
Phillip B. Rooney	Accutest Laboratories
Lynda Rose	Self
Dominica Sanchez	Self
William A. Schew	O'Brien & Gere
Linda Schiller-Hanna	Self
Nancy Schmitt	Taum Sauk Investments, LLC
James M. Seif	Self
Daniel E. Seiple	Self
Kathleen M. Sgamma	Western Energy Alliance
Jamie Sitko	Self
Barbara McIlvaine Smith	Self
Christopher A. Smith	U.S. Department of Energy
Darren Smith	Devon Energy Corporation
Gregory H. Sovas	XRM, LLC
Shelley Stark	Self
Nancy Sullivan	Self
Philip F. Sweet	Self
Nick and Barb Teti	Self
V. Bruce Thompson	American Exploration & Production Council
Tom Thorson	Black Hills Bentonite Co.
Tad True	Belle Fourche Pipeline Company
Thomas G. Tunnicliff	Atlantic Richfield Company

Steve A. Vanderboom	Pace Analytical Services, Inc.
Neil Vitale	Self
Theodore J. Voneida	Northeastern Ohio Medical University
Tom Walker	True Oil LLC
Fred Welty	Self
Sasha White	Self
Jan Williams	Self