Unconventional Resources Technology Advisory Committee (URTAC)
October 13-14, 2010

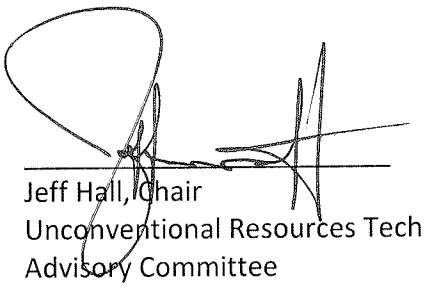
Fourteenth Meeting

Meeting Minutes

A Federal Advisory Committee to the U.S. Secretary of Energy

Unconventional Resources Technology Advisory Committee

I hereby certify that this transcript constitutes an accurate record of the Unconventional Resources Technology Advisory Committee meeting held on October 13-14, 2010.



Jeff Hall, Chair
Unconventional Resources Technology
Advisory Committee

OCT 19 2011

Date

Unconventional Resources Technology Advisory Committee (URTAC) Meeting
October 13-14, 2010, Wyndham Hotel, New Orleans, Louisiana

Chairman Jeff Hall called the meeting to order at 8:00 AM. He restated the annual plan review process, agenda, and outlined the task at hand for the Committee: 1) hear four subcommittee reports, 2) develop a single set of findings and recommendations, 3) prepare a cover letter, and 4) instruct the Editing Subcommittee to assemble the final report. The meeting agenda is Attachment 1.

Guido DeHoratiis, DOE Product Line Director Oil and Natural Gas, and Acting Designated Federal Officer (DFO) (Attachment 2), confirmed that there was a quorum with 18 of 22 members present (Attachment 3). Each of four Subcommittees then briefly outlined the results of their work. Subcommittee written reports are appended.

Research Program Subcommittee (Shahab Mohaghegh) (Attachment 4)

Members: Sparks, Oglesby, Lewis, Camp, Harju, Nilson, **Dwyer, Mohaghegh,** Mall, Brown, Rodgers

Shahab Mohaghegh described key points of the research Committees report, developed during the committee conference call on 9/30/2010:

- The original and existing research program includes environment health and safety (EHS) … The Subcommittee expressed concern that a major shift in focus may diminish the goal to maximize value of domestic hydrocarbon supply, and may be duplicative of other current initiatives (EPA, State EIS studies). The program should demonstrate how past and current research is addressing EHS concerns, and should better communicate project accomplishments. In this respect, the subcommittee recommends that research proposals include a statement of EHS applications.
- DOE public funding research is needed, the current research is not duplicative of private initiatives
- Desire DOE to increase public outreach to provide unbiased public education regarding the responsible development of unconventional resources … and to expand public research solicitations to include non-energy related organizations that may have novel (unrecognized) energy applications.
- Some specific research needs that should receive increased focus include:
    - Water use and re-use
    - Minimize surface impact
    - Alternate (non-flare) well testing to reduce pipeline cost risk and air quality impacts
    - Frontier and emerging unconventional resources (oil-prone shale, tight sands and carbonates)
    - Identification of static and dynamic sweet spots
    - Technologies to increase the use of natural gas in the trans

- For the near to midterm a portion of funds should likely be focused on technology applications that address public concern. Not only should research be conducted on these topics but funding used to educate the public and local government of results and the risks to their community. Without leadership from federal and local governments uncertainty will prevail.
- Water is a valuable resource that should be conserved regardless of the industry. The program should continue to fund technologies that address efficient use of our water resource to develop energy plays.
- Technical/factual corrections or other objections to DOE document:
    - p. 16, 2011 Solicitations: recommend changing "any onshore" to "any onshore unconventional" at 3rd and 4th bullets as this is too broad for unconventional reservoir research scope.
    - p.17, last PP: stating that a major goal is to conduct research to help create and enforce regulations appears to be outside the original scope of Section 999 as defined by Congress.

Environmental & Regulatory Subcommittee (Bob Kleinberg) (Attachment 5)

Environmental & Regulatory: **Arthur**, Martin, Kleinberg, Brown, Mall, Mason, Hardage, Dwyer, Cavens, Bromfield

Bob Kleinberg initiated the discussion by stating that there was no consensus among the subcommittee members. In summary, the subcommittee strongly supports the recognition that potential negative environmental impacts must be well defined and appropriate plans and technologies must be in place to either prevent them or mitigate them. The subcommittee also supports the proposal to focus the plan on quantifying potential environmental impacts and developing technologies to counter them.

Technology Transfer Subcommittee (Fletcher Lewis) (Attachment 6)

Technology Transfer/Public Outreach: **Lewis**, C. Hall, J. Hall, Martin, Mason, Dwyer, Nilson, Rodgers

Fletcher Lewis described key points of the Subcommittee. In the 2007 URTAC Committees' report, a web based system was identified as needed to disseminate research and development activities, lessons learned and knowledge management around Unconventional Resources and Small Producer Programs (Section 999) to those communities. Since the original recommendation was made in the 2007 plan, NETL has developed a system called the Knowledge Management Database (KMD which was made available to the public in October of 2009. The DOE is to be commended for creating this very important program.

Policy Subcommittee (Chris Hall) (Attachment 7)

Policy: Whitney, **C. Hall,** Oglesby, Daugherty, Arthur, Mason, Brown

Chris Hall described key points of the Policy Committee's report. Executive Summary designed to recognize Administration's new interest in Section 999 … this is a new thing … the fact that the Administration is interested rather than "fulfilling the Law." However, it should be noted that Section 999 specifically directed the Secretary of Energy to: "Increase the supply of natural gas and other petroleum resources through reducing the cost and increasing the efficiency of exploration and production." The subcommittee strongly believes that a balance needs to be achieved between the intent of the Section 999 legislation under which the existing program has been carried out, and the change of direction being proposed by the DOE. The Policy subcommittee believes that the basic R&D programs now funded by Section 999 should be true to the legislation by retaining the breadth of the program being carried out by RPSEA and as presented in their 2011 Annual Plan, albeit with some increase in environmental and safety focus being put forth in the DOE's 211 Annual Plan. We encourage DOE to support their own recommendations with increased budgets and developing other areas of their programs (Core and Complementary).

Discussion

After the break, the Chair restated the plan for the rest of the day. The DFO pointed out that the Advisory Committee's task is to comment on DOE's *2011 Annual Plan*, which was informed by the RPSEA Draft Annual Plan. He also pointed out that, taken as a whole, the 2007-2010 research portfolios do focus heavily on supply and reducing costs and increasing efficiency. The *2011 Annual Plan* can be seen as an attempt to provide more balance to the research portfolio as is exists so far.

After lunch, the entire committee began to work through each of the subcommittee documents, to:

- Revise each report into the format of findings and recommendations
- Agree on the wording of the findings and recommendations
- Move particular findings/recommendations to a more appropriate subcommittee report, as necessary
- Move particular statements to the introduction, executive summary or cover letter, as necessary
- Delete items that were determined, upon discussion, to be redundant or unnecessary

Thursday October 14th

The second day's meeting began at 8:00 a.m. and work continued on revisions to the remaining two sections: the Research Program Subcommittee and the Technology Transfer Subcommittee reports. There was one important point made during this session: Amy Mall stated that she was not in agreement with any language that stated that the URTAC "was concerned" with the shift in the *2011 Annual Plan* focus and solicitations to research that was directed towards environmental issues rather than supply issues. She was not concerned with that shift and, in fact, welcomed it. This remained a point that she felt might lead to a minority opinion, depending on the find wording of the Committee report.

Discussion
The DFO asked for the committee to rank the solicitation topics recommended in the *2011 Annual Plan*. This was done with a show of hands, and with the following results.

Unconventional Resources
(TOP PRIORITY) Proposals to develop new technologies necessary to enable more efficient and environmentally benign development of unconventional natural gas resources. Specific topics may include, but are not limited to the following:

- The use of extra-extended single and multi-lateral drilling techniques
- "Green" completion techniques, including non-toxic fracturing fluids
- Technologies and methods to reduce fugitive emissions during drilling and completion operations
- Improved techniques for zonal isolation when cementing casing
- Stimulation methods that result in a lower volume of treatment fluids produced to the surface
- Advanced drilling, completion, and/or stimulation methods that allow a greater volume of reservoir to be accessed from a single surface location
- Approaches that minimize the surface impact of well construction

(SECOND PRIORITY) Proposals to develop new technologies necessary to enable continued high volume hydraulic fracturing in shale plays while minimizing environmental impact. Specific topics may include, but are not limited to the following:

- Comprehensive approaches for the conservation and management of water resources used and produced during all aspects of unconventional gas development
- Water management approaches that minimize the impact of drilling, completion, stimulation, and production operations on natural water resources
- Methods for the treatment of produced water and fracturing fluids with intermediate and high total dissolved solids
- Methods for enabling beneficial use of produced water
- Surface produced water spill mitigation methods applicable to all environments

(THIRD PRIORITY) Proposals to evaluate the environmental and safety aspects of current approaches to unconventional gas development, to identify any vulnerability and to provide guidance on approaches to reduce and mitigate any risks. Specific topics may include, but are not limited to the following:

- Comprehensive evaluation of the environmental risks associated with unconventional gas development and production operations associated with any general or specific unconventional gas resource
- Technologies to advance the science of warning systems to mitigate or prevent any safety or environmental accidents at any onshore E&P operation
- Technologies to advance the science of damage control regarding safety and environmental accidents at any onshore E&P operation
- Methods to further minimize the environmental impact of any onshore E&P operations

- Methods to further improve safety procedures impacting personnel involved with onshore E&P operations
- Environmental studies concerning the value of ecosystem services that may be impacted by onshore E&P operations

(LOWEST PRIORITY**)** Proposals that develop integrated solutions to environmental challenges. An important aspect of the UCR program is encouragement of teaming efforts to integrate geologic concepts with engineering principles to overcome production and environmental issues. The intent is to develop a program where the whole has greater value than the sum of the parts. This synergy among individual projects is best achieved when there is an opportunity for multiple projects to share common datasets and apply a range of technologies to the solution of a common problem.

Small Producer Challenges

(TOP PRIORITY) Proposals to develop novel methods that provide positive environmental benefits while extending the economic life of mature fields. Specific topics may include but are not limited to the following:

- Creative capture and reuse of industrial waste products (produced water, excess heat) to reduce operating costs or improve recovery
- Methods for leveraging of existing wellbores and surface footprint to maximize recovery of additional hydrocarbons without environmental disruption
- Development of methods for improving oil and gas recovery and/or extending the economic life of marginal wells in environmentally responsible ways

(SECOND PRIORITY) Proposals to gather data and perform analyses to support the development of economically practical and enforceable water management standards and other regulations. Specific topics may include, but are not limited to, the following:

- Development of data to support the design of environmentally focused, economically practical produced water management standards
- Development of new or improved methods for water management, including produced water shutoff or minimization, treatment and disposal of produced water, and minimization of water use
- Collection and organization of existing well and field data from multiple sources into a readily accessible and usable format that will inform the development of science-based regulations

(THIRD PRIORITY) Proposals to develop methods to mitigate environmental impacts in mature fields. Specific topics may include but are not limited to the following:

- Development of cost-effective producing well monitoring methods that can reduce the likelihood of uncontrolled release of fluids
- Development of new or improved methods for well site or producing facility site remediation

The Editing Subcommittee was charged with meeting in the afternoon to complete the final version of the report.

There were no members of the public that wished to make a public comment so the meeting was adjourned.

Attachments

	Presenter	Topic
1	For the Record	Meeting Agenda
2	For the Record	Designated Federal Officer Delegation Letter
3	For the Record	Committee Members and Meeting Participant Attendance
4	Mr. Shahab Mohaghegh	Research Program Subcommittee Report
5	Mr. Bob Kleinberg	Environmental & Regulatory Subcommittee Report
6	Mr. Fletcher Lewis	Technology Transfer Subcommittee Report
7	Mr. Chris Hall	Policy Subcommittee Report

Attachment 1

Unconventional Resources Technology Advisory Committee
14th Meeting, October 13-14, 2010
Wyndham Riverfront New Orleans
701 Convention Center Boulevard, New Orleans, LA 70130
AGENDA

October 13, 2010

7:30 a.m. CDT	*Continental Breakfast/Check-In*	*Members & Public*
8:00	**Call to Order** / Welcome / Meeting objectives Overview of the approved agenda	Jeff Hall, Chair
8:10	**Opening Remarks** Confirmation of quorum	Guido DeHoratiis Acting Designated Federal Officer
8:25	**Subcommittee Reports***	Jeff Hall

Research Program	Dwyer, Mohaghegh
Environmental & Regulatory	Arthur
Technology Transfer/Public Outreach	Lewis
Policy	C. Hall

* *Subcommittee Lead presentations = 10 minutes plus 10 minutes for clarifying questions.*

10:00	**BREAK**	
10:15	**Discussion and Development of Recommendations** *45 min. per topic*	Jeff Hall and Facilitator
12:00 pm	**LUNCH**	
1:00	Continue Discussion and Development of Recommendations	
2:30	**BREAK**	
2:45	Continue Discussion and Development of Recommendations	
4: 45	Public Comments	G. DeHoratiis
5:00	Adjourn for the day	G. DeHoratiis

October 14, 2010

7:30 a.m. CDT	*Continental Breakfast/Check-In*	*Members & Public*
8:00	**Call to Order** / Session objectives	Jeff Hall, Chair
	Complete Discussion and Development of Recommendations	
9:45	**Executive Summary and Cover Letter**	
10:30	**BREAK**	
10:45	**Instructions to the Editing Subcommittee**	
11:45	**Committee Calendar and Next Steps** October 21, 2010, 15th Meeting	G. DeHoratiis
12:00	**Adjourn**	Jeff Hall

APPROVED: _____ 10/14/10
Christopher A. Smith, Designated Federal Officer — Date

Attachment 2

MEMORANDUM FOR FILE

TO: UNCONVENTIONAL RESOURCES TECHNOLOGY ADVISORY COMMITTEE

FROM: CHRISTOPHER A. SMITH
DESIGNATED FEDERAL OFFICER
UNCONVENTIONAL RESOURCES TECHNOLOGY ADVISORY COMMITTEE

SUBJECT: **Acting Designated Federal Officer**

I hereby designate Guido DeHoratiis, Director of Oil and Gas Resource Conservation, to serve as the Acting Designated Federal Officer for the meeting of the Unconventional Resources Technology Advisory Committee on October 13, 2010, in New Orleans, LA.

Attachment 3

Unconventional Resources Technology Advisory Committee Meeting
Member Sign-In Sheet - October 13-14, 2010

Last Name	First Name	Organization	Initial
Arthur	J. Daniel	ALL Consulting, LLC	UNABLE TO ATTEND
Bromfield	Kenneth	Dow Hydrocarbons and Resources, LLC	
Brown*	Nancy J.	Lawrence Berkeley National Laboratory	
Camp	Wayne K.	Anadarko Petroleum Corporation	
Cavens	Jessica J.	EnCana Oil & Gas (USA)	
Daugherty	William S.	NGAS Resources, Inc.	**UNABLE TO ATTEND**
Dwyer	James P.	Baker Hughes	
Hall	Jeffrey D.	Devon Energy Corporation	
Hall	J. Chris	Drilling & Production Co.	
Hardage*	Bob	University of Texas at Austin	**UNABLE TO ATTEND**
Harju*	John A.	University of North Dakota	**UNABLE TO ATTEND**
Kleinberg	Robert L.	Schlumberger-Doll Research	
Lewis	Fletcher S.	Rainmaker Oil & Gas	
Mall	Amy	Natural Resources Defense Council	
Martin*	John P.	New York Energy Research & Development Authority	
Mason	Gregory	The Energy Cooperative	
Mohaghegh*	Shahab D.	West Virginia University	
Nilson	Gary J.	Pioneer Natural Resources USA, Inc.	
Oglesby	Kenneth D.	Oak Resources, Inc.	
Rodgers	Brady D.	New Frontier Energy, Inc.	
Sparks	Don L.	Discovery Operating, Inc.	
Whitney	Sam W.	Shell E&P Company	

Total Members = 22

QUORUM = 12

Confirmed attendees = 19

Regrets = 3

* Special Government Employee

Unconventional Resources Technology Advisory Committee Meeting
October 13-14, 2010

DOE Staff Roster

U.S. Department of Energy – Office of Oil and Natural Gas

Guido DeHoratiis Director of Oil & Gas Resource Conservation	Acting Designated Federal Officer

National Energy Technology Laboratory

Roy Long	Ultra-Deepwater & Unconventional Natural Gas and other Petroleum Resources Technology Manager
Gary Covatch	Strategic Center for Natural Gas & Oil

IBM

Karl Lang	Meeting Minutes Recorder/Facilitator
Rob Matey	Meeting General Support
Gladys Savone	Registration Support

Unconventional Resources Technology Advisory Committee Meeting
Public Sign-In Sheet - October 13-14, 2010

Name	Organization	Phone	E-mail
Bob Siegfried	RPSEA	281 785-2990	rsiegfri@rpsea.org
~~Gary Alesi~~			

Attachment 4

Research Program Subcommittee

Conference Call Discussion Summary (9/30/2010)

1) Original and existing RPSEA goals include EHS (increasing domestic gas supply in environmental and safe manner).
    a. Concerned a major shift in focus may diminish goal to maximize value of domestic hydrocarbon supply, and may be duplicative of other current initiatives (EPA, State EIS studies)
    b. Welcome opportunity to demonstrate how past and current research are addressing EHS concerns-should better communicate project accomplishments
    c. Recommend research proposals include statement of EHS applications. The DOE plan response discusses overarching objectives that the plan should address. A suggestion is that these objectives not be incorporated into the plan recommendations but into the selection committee criteria. Many already exist to some extent. Some clearly outlined others inferred. The criteria used to grade project proposals could easily include these four overarching principles.
        - Increase production recovery in an environmentally sound manner - should be a goal of every project.
        - Reduce Environmental impact – a social responsibility of every project
        - Encourage Demonstrations of technology - a part of a project's technical transfer criteria
    d. Develop Technologies to enable environmentally responsible development of emerging gas – a possible funding objective framed to address other natural resources.
2) DOE public funding research is needed, RPSEA projects are not duplicative of private initiatives
3) Desire to increase public outreach by government to:
    a. Improve unbiased public education regarding the development of unconventional resources in a responsible manner.
    b. Expand public research solicitations to include non-energy related organizations that may have novel (unrecognized) energy applications
    c. Increase knowledge of public regulatory and government bodies
4) Specific research needs include:
    a. Water use and re-use
    b. Minimize surface impact
    c. Alternate (non-flare) well testing to reduce pipeline cost risk and air quality impacts
    d. More funding allocation to frontier and emerging unconventional resources (oil-prone shale, tight sands and carbonates)
    e. define research goals for remaining 5-years (long-term novel projects)
    f. Identification of static and dynamic sweet spots by incorporating science and engineering that target production optimization.

5) Research funding from the Draft Annual plan has worked on technology development to improve efficiency. For the near to midterm a portion of Research funds should likely be focused on technology applications that address public concern. Not only should research be conducted on these topics but funding used to educate the public and local government of results and the risks to their community. Without leadership from federal and local governments uncertainty will prevail.
6) Water is a valuable resource that should be conserved regardless of the industry. The program should continue to fund technologies that address efficient use of our resource to develop energy plays.

Technical and factual corrections or other objections to DOE document

p. 16, 2011 Solicitations: recommend changing "any onshore" to "any onshore unconventional" at 3rd and 4th bullets as too broad for unconventional reservoir research scope.
p.17, last PP: stating that a major goal is to conduct research to help create and enforce regulations appears to be outside the original scope of Section 999 as defined by Congress. Does the Secretary of Energy have the ability to change the Congressional intent?

Attachment 5

Environmental & Regulatory Committee

Members: Arthur, Martin, Kleinberg, Brown, Mall, Mason, Hardage, Dwyer, Cavens, Bromfield

Finding 1

- Though the USDOE draft annual plan and the RPSEA draft annual plan are not in conflict, the USDOE plan reflects a more defensive posture on the issue of environmental impacts. This realignment of priorities is based on the realistic need to improve exploration and production in ways that reduce environmental impacts. However, many real and perceived threats can be dealt with though appropriate regulation and enforcement. The RPSEA plan focuses more on using research and demonstrations to identify new methods to improve efficiency and mitigate environmental issues caused by drilling unconventional resources. Since Section 999a specifically identifies the program element as "unconventional natural gas and other petroleum resource exploration technology," the RPSEA approach seems more consistent with the stature.
- It is reasonable, based on the enabling statute and the RPSEA plan, that the unconventional resources program can use its resources to help identify the key environmental issues that pose a real threat to the environment. It could contribute to the development of technologies to exploit these resources and help develop and demonstrate new approaches to lessen the environmental impacts.. However, part of the identification work may be better suited for USDOE's complementary program rather than though an industry-led consortium.

Recommendation 1

- Recommendation 1-1: USDOE should consider providing more funding to NETL and other institutions to strengthen its environmental research program by helping to identify the most significant environmental issuesand to provide guidance for the prudent development of unconventional resources. This effort should seek to support research in all of the key play areas since each has its own unique natural and built environment.
- Recommendation 1-2: RPSEA should put greater emphasis on identifying technologies that help balance the objective of improving unconventional resources production with the objective of reducing environmental impacts of production.
- Recommendation 1-3: It should not be the role of RPSEA or the section 999 programs to attempt to resolve the clear jurisdiction of the state and federal regulatory agencies. The most valuable role these two programs can serve would be to provide good, sound science that can inform practice and policy. This is consistent with the statute (which includes environmental mitigation) and the RPSEA model.

Finding/Recommendation 2

- Finding 2: The DOE Plan reflects the increasing public attention being paid to the perceived risks of domestic oil and gas production. The RPSEA Plan should address these perceived risks forthrightly.
- Recommendation 2-1: The Description of Planned Solicitations (RPSEA Plan pg 60-61) should specify that every proposal include an assessment of the ultimate environmental impact of the apparatus or method that may result from the proposed research. Such impacts may be positive or negative or both.
- Recommendation 2-2: Award announcements should include the Program Consortium's estimate of the ultimate environmental impact of the apparatus or method that may result from the supported research. Such impacts may be positive or negative or both.

Finding/Recommendation 3

- Finding: The Program Consortium should be proactive in generating a sound scientific basis for public discussion and policy initiatives concerning risk identification and avoidance, and concerning the mitigation of environmental hazards associated with development of unconventional resources.
- Recommendation: RPSEA should solicit proposals specific to the environmental impacts of fracturing, water management, surface footprint, and safety [RPSEA Plan pg 61-65: §(2)(e)(vii-x); § (2)(f); § (2)(i); § (4)].

Finding /Recommendation 4

- Finding: Overarching program goals are to "…include specific efforts to more fully define the risks associated with unconventional gas development, and ensure that appropriate technologies are available to mitigate those risks. " Although this goal is appropriate, it ignores the fact that technology development alone may not be the overriding solution to the concerns noted.
- Recommendation: Program goals should be modified to incorporate development and understanding of appropriate practices and procedures and to understand the consequences of regulatory frameworks as well as other issues associated with the efficacy of various mitigation options (whether technology or practice) are available. It is critical to understand that it is not always the availability of technology that is most important, but how we use the technologies available to us AND our understanding of their benefits and limitations.

Finding /Recommendation 5

- Finding: Under Public Concerns, the Sub-Committee found multiple issues requiring clarification
- Recommendations
  - Water demands for shale gas wells may exceed 2-3 million gallons. Water use associated with some wells has exceeded 10 million gallons. Recent SRBC statistics show the average Marcellus water use per well is between 3-4 million gallons. Current practice indicates that wells may require more than 2-3 million gallons of water.
  - Flowback is a process and should be referred to as such. Water returning from the well is produced water, which may include spent fracturing fluids and natural formation water.
  - Under air quality, note that intentionally vented emissions (stranded gas) are also a concern, particularly those with large Global Warming Potential.

Finding/Recommendation 6

- Finding: For the Overarching Objectives of the UCR Program and under the first bullet, the substantial increase of commercial production or accelerated development should not be overarching objectives of the UCR program.
- Recommendation 6-1: Modify to "Increase **ENERGY SUPPLY** in an Environmentally Sound Manner" – Develop tools, techniques, and methods that increase, in an environmentally sound manner, the supply of unconventional gas and other petroleum resources through reducing the cost and increasing the efficiency of exploration and production."
- *Recommendation 6-2: On Page 16, the fourth overarching objective has no focus on the goal of efficiency and while environmental responsibility is mentioned in the title of the objective, it is not mentioned in the description. The following re-wording is suggested:*
  - *Develop Technologies to Increase Environmental Responsibility in the Development of Emerging Gas Plays: Develop techniques and methods for increasing environmental responsibility and efficiency in the exploration and production from high priority emerging gas shales, coal, and tight sand fields, as well as frontier basins and formations.*

Finding/Recommendation 7

- Finding #1: The emphases of the *Department of Energy 2011 Annual Plan: Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Research and Development Program, Draft, September 2010* (henceforth: "DOE Plan") on environmental risk identification, prevention, and mitigation, are generally consistent with the *RPSEA 2011 Draft Annual Plan, July 2010* (henceforth: "RPSEA Plan"). Therefore relatively modest changes can bring the RPSEA Plan into alignment with the DOE Plan.
- Recommendation #1a: RPSEA should revise, as necessary, its Mission, Goal, Objectives, and Implementation Plan (pg 56-66) to reflect the Overarching Objectives of the DOE Plan (pg 15-16).
- Recommendation #1b: RPSEA should maintain its focus on the development of an integrated program that builds on its prior research programs (RPSEA Plan pg 58-59; solicitation goal #1, pg 61-62), consistent with the overarching objective of "encouragement of teaming efforts to develop integrated production technologies for unconventional gas resources. . . . The intent is to develop a coordinated program, as opposed to individual projects, such that the whole has much greater value than the sum of the parts." (DOE Plan pg 16)

RPSEA Plan 1

- Finding: The plan states that additional efforts will be directed toward evaluating risks, and says these efforts "*may* include environmental studies to fully understand how technologies can preserve, protect, or restore natural resources."
- Recommendation: In the paragraph above, "may" should be changed to "must"

RPSEA 2

- Finding: The plan states that "*some* assessment of the vulnerabilities of existing technologies *may* be appropriate to ensure that any risks are fully understood and effectively mitigated." Also, "the 2011 program *may* include specific efforts to more fully define any risks associated with unconventional gas development" and "priorities *may* include developing technologies and performing environmental studies concerning response, clean-up and the value of ecosystem services that may be impacted if an emergency situation should arise during exploration and production activities."
- Recommendation: To the contrary, we think these should be an essential part of the plan, not optional.

Summary

- We strongly support the recognition that potential negative environmental impacts must be well defined and appropriate plans and technologies must be in place to either prevent them or mitigate them.
- We support the proposal to focus the plan on quantifying potential environmental impacts and developing technologies to counter them.

Attachment 6

UNCONVENTIONAL RESOURCES TECHNOLOGY TRANSFER COMMITTEE

In previous reports, the Unconventional Resources Technical Advisory Committee recommendations addressed the need for a more modern and accessible knowledge management database and a robust Technology Transfer program as being critical to the success of the Unconventional Resources and Small Producer programs.

In the 2007 URTAC Committees' report, a web based system was identified as needed to disseminate research and development activities, lessons learned and knowledge management around Unconventional Resources and Small Producer Programs (Section 999) to those communities. Such a knowledge repository has an almost limitless potential to the oil and gas and environmental interests around not only Unconventional Resources but other Department of Energy programs. Since the original recommendation was made in the 2007 plan, NETL has developed a system called the Knowledge Management Database (KMD which was made available to the public in October of 2009. This database is available at **www.netl.doe.gov/KMD**. The DOE is to be commended for creating this very important program.

DOE has addressed the need for Technology Transfer to the producing regions of the country by using the Petroleum Technology Transfer Council (PTTC) among others as their TT agents to assist in this effort. While the PTTC has heretofore focused on a regional approach, the need to disseminate information at the national level is proving to be more challenging.

RPSEA has held several stand alone symposiums dealing with the presentation of the various research projects and has had some reviews of the individual research projects.

FINDING:
While significant strides have been made to address the Technology Transfer needs of the Section 999 program, there is still much that needs to be done. After all, It requires effective Technology Transfer (TT) for the Section 999 R&D program to be successful.

Recommendation 1: RPSEA needs to offer more workshops with their contract with the PTTC. It is recommended that smaller regional workshops showing the various research projects be given specifically those that are germane to the region or the emerging technology of those regions. That RPSEA and PTTC endeavor to hold more one-day symposiums preferably with poster sessions to be held in conjunction either before of after other shows such as AAPG, SPE or NAPE.

Recommendation 2: The Knowledge Management Database needs to be made to be more user friendly to allow a quick log on preferably with a synopsis as to the content of the research and associated websites to determine what other material might be out there.

Recommendation 3: A strong requirement with a disclaimer should be part of every paper or research presented. The intent for RPSEA is to fund ongoing research, however since we can not control the end results of conclusions of this research and results may be presented that are controversial or suspect, RPSEA and the DOE should not be placed in a position of tacitly approving of those results. Likewise, during the research process, selected arguments or viewpoints should not be given to other outside sources until the paper has been presented in its entirety for all parties to be able to review the research and conclusions. It might be recommended that papers not be released on idealizations or concepts alone until there has been an attempt at field testing to determine whether a concept is truly viable (this might be better placed under RESEARCH PROGRAM TOPIC).

Recommendation 4: The DOE through its complimentary program with RPSEA, PTTC or other groups create a series of local workshops offering schools in both general oilfield and well safety and including a strong leaning to address the current environmental requirements. Also that the same organization offer an outreach to the general public that would allow a clearing house or contact on various oil and gas issues. Currently the only real parties doing so seem to be those with anti-oil agendas leaving the public in a vacuum as to many of the technical issues involved. This group, as well as supplying safety programs, could be used to provide a tech transfer of continuing research and important technology changes that may be of interest to regulators and other decision makers.

Attachment 7

POLICY SUB-GROUP FINDINGS & RECOMMENDATIONS
(Last Revised October 7, 2010)

Sub-Group Members:

Dan Arthur, All Consulting, LLC
Nancy Brown, Lawrence Berkeley National Laboratory
Bill Daugherty, NGAS Resources, Inc.
Chris Hall, Drilling & Production Co.
Greg Mason, The Energy Cooperative
Ken Oglesby, Acorn Resources, Inc.
Sam Whitney, Shell E&P Company

EXECUTIVE SUMMARY:

The interest shown by the Administration in the Department of Energy's (DOE) Section 999 Research and Development (R&D) programs is itself a major change in focus that is very welcome news for working to develop secure domestic energy supplies. However, it should be noted that the 2005 Energy Policy Act was enacted as H.R.-6 by the 109th Congress; Section 999 addresses the portion of the legislation that pertains to the oil and gas industry. The Bill specifically directed the Secretary of Energy to: "Increase the supply of natural gas and other petroleum resources through reducing the cost and increasing the efficiency of exploration and production." We strongly believe that a balance needs to be achieved between the intent of the Section 999 legislation under which the existing program has been carried out, and the change of direction being proposed by the DOE. We believe that the basic R&D programs now funded by Section 999 should be true to the legislation by retaining the breadth of the program being carried out by RPSEA and as presented in their 2011 Annual Plan, albeit with some increase in environmental and safety focus being put forth in the DOE's 211 Annual Plan. We strongly encourage the DOE to support their own recommendations with increased budgets and developing other areas of their programs (core and complimentary).

INTRODUCTION/OPENING COMMENTS:

The 2005 Energy Policy Act was enacted as H.R.-6 by the 109th Congress; Section 999 addresses the portion of the legislation that pertains to the oil and gas industry. The Bill specifically directed the Secretary of Energy to:

1) Implement a program of research and commercial application of technologies for ultra-deepwater and unconventional natural gas and other petroleum resource exploration and production; and
2) Increase the supply of natural gas and other petroleum resources through reducing the cost and increasing the efficiency of exploration and production. (Emphasis added.)

Anything that does not achieve these two principle tenants is not in keeping with the purpose of the original Rule.

The interest shown by the current Administration in the Department of Energy's (DOE) Section 999 Research and Development (R&D) programs is itself a major change in focus that is very welcome news for working to develop secure domestic energy supplies. The 2005 Energy Policy Act provided legislation for a ten year program as a means to provide stability for R&D programs by eliminating the threat of termination of funding that was inherent with the annual

budgeting process. Nevertheless, the past four Advisory Committee reports have been written under the threat that the Administration in office proposed zeroing out the funding for all oil and gas programs, including that provided by Section 999.

With regards to the major change in program focus that is being proposed by the DOE in their 2011 Annual plan, we strongly believe that a balance needs to be achieved between the intent of the Section 999 legislation under which the existing program has been carried out, and the change of direction being proposed by the DOE. We strongly encourage the DOE to support their own recommendations with increased budgets and developing other areas of their programs (core and complimentary). We believe that the basic R&D programs now funded by Section 999 should be true to the legislation by retaining the breadth of the program being carried out by RPSEA and as presented in their 2011 Annual Plan, albeit with some increase in environmental and safety focus.

The DOE is in a unique position in its ability to work between the industry and regulators. DOE achieves this by providing sound science which contributes to finding the optimum balance between the need to support a crucial domestic energy industry, enhance the safety of its operation, and protect the environment. During the past 25 years DOE has evolved in this role as the oil and gas industry worked its way out of a 15 year depression. The DOE's knowledge and unique perspective is of tremendous value to all stakeholders.

FINDINGS & RECOMMENDATIONS:

1) **ISSUE #1: REQUIREMENTS OF EXISTING LEGISLATION:**
   a) FINDING:
      i) The DOE's 2011 Annual Plan proposes a major shift in focus to primarily address environmental, health, safety and regulatory issues in place of the current Research and Development (R&D) that is focused on petroleum resource exploration and production. We believe that this is a misinterpretation of the Sec 999 legislation.
         (1) The DOE incorrectly cites the introductory summary of the Legislation as justification for their major shift in focus: "The Secretary shall carry out a program … of research, development, demonstration, and commercial application of technologies for ultra-deepwater and unconventional natural gas… including improving safety and minimizing environmental impacts of activities within each area."
         (2) The phrase "including improving safety and minimizing environmental impacts of activities within each area" is listed as an included element of the program and not as the principal focus of the program. See underlined area below from which the DOE plan was taken from the Legislation:

             "SEC.999A. PROGRAM AUTHORITY.
             (a) In General --The Secretary shall carry out a program under this subtitle of research, development, demonstration, and commercial application of technologies for ultra-deepwater and unconventional natural gas… and other petroleum resource exploration and production, including addressing the technology challenges for small producers, safe operations, and environmental

mitigation (including reduction of greenhouse gas emissions and sequestration of carbon).
(b) Program Elements.-- The program under this subtitle shall address the following areas, including improving safety and minimizing environmental impacts of activities within each area:
(1) Ultra-deepwater…
(2) Unconventional natural gas…
(3) The technology challenges of small producers.
(4) Complementary research performed by NETL…"

Furthermore, the "Focus Areas for Awards" does not list environmental and safety as specific topics:

"SEC.999B ULTRA-DEEPWATER AND UNCONVENTIONAL ONSHORE, NATURAL GAS AND OTHER PETROLEUM RESEARCH AND DEVELOPMENT PROGRAM
(d) Selection of the Program Consortium.—
(7) FOCUS AREAS FOR AWARDS.—
ULTRA DEEPWATER RESOURCES.— Awards from allocations under section 999H(d)(1) shall focus on the development and demonstration of individual exploration and production technologies as well as integrated systems technologies including new architectures for production in ultra-deepwater.
UNCONVENTIONAL RESOURCES.— Awards from allocations under section 999H(d)(2) shall focus on areas including advanced coalbed methane, deep drilling, natural gas production from tight sands, natural gas production from gas shales, stranded gas, innovative exploration and production techniques, enhanced recovery techniques, and environmental mitigation of unconventional natural gas and other petroleum resources exploration and production.
SMALL PRODUCERS.-- Awards from allocations under section 999H(d)(3) shall be made to consortia consisting of small producers or organized primarily for the benefit of small producers, and shall focus on areas including complex geology involving rapid changes in the type and quality of the oil and gas reservoirs across the reservoir; low reservoir pressure; unconventional natural gas reservoirs in coalbeds, deep reservoirs, tight sands, or shales, and unconventional oil reservoirs in tar sands and oil shales."

ii) Heretofore, based on the content of the past Annual Plans: RPSEA, DOE and the Advisory Committees have applied the Legislation as meaning that "improving safety and minimizing environmental impacts" were elements of the program that should be considered as an important component of every R&D and Technology Transfer project that was awarded, but was not necessarily the primary focus of each project. Also, several projects were awarded that addressed these elements as the primary focus of the project (i.e.: The Environmental Friendly Drilling Systems Program). However, these topics are only a fraction of the total number of projects awarded.
iii) The environmental concerns of the recent BP Off-Shore well blow-out and expansion of oil and gas exploration into new unconventional onshore areas (such as the

Marcellus) has given rise to issues that need to be addressed and resolved. We strongly agree that some of these are issues are well suited to R&D award topics under the Section 999 program, but not to the exclusion of the existing program topics.

iv) The Sec.999 funding was the result of efforts by the oil and gas industry working with the Congress and Senate as part of the 2005 Energy Bill to ensure that funding was invested in research and development so as to increase domestic oil and gas supplies. The environmental and safety elements were added as part of the committee hearing process to address the concerns of the environmental community that these would be elements of the program (though not the primary purpose). The proposed major change in focus of the 2011 Annual Plan turns the program upside-down, making environmental and safety the major focus; this was never the intended purpose of the program.

v) With respect to the need to address environmental and safety concerns, DOE states that "In support of this goal the Department of Energy will collaborate with Federal state regulatory agencies in the selection and administration of 2011 research projects". Reference is made to a "Federal state regulatory agency". These are novel concepts that are not addressed in the legislation. Furthermore, as far as the RPSEA portion of the program is concerned, the selection of projects is to be made by industry representatives, not by the DOE.

vi) A significant change in focus could cause loss of support of part of the program constituents: Administration, the Legislature, DOE, RPSEA, oil and gas industry, as well as other interested stakeholders. Thus, a balanced approach that is mindful of the existing legislation is necessary.

b) RECOMMENDATION:

i) The 2011 Annual Plan (as well as all future plans) should continue to address the range of topics that are proposed in the RPSEA Draft Annual Plan. These are well balanced and have the endorsement of the DOE and Advisory Committees in the past.

ii) To the extent possible, all R&D projects and TT efforts should continue to include as elements the improving of safety and minimizing of environmental impacts. This should be included as a metric of the success of the program.

iii) In order to respond to the environmental and safety concerns raised by recent events, a greater share of the projects should address these elements; however, in no way should these solely become a major emphasis of the entire Section 999 program.

iv) R&D on environmental, health, safety and regulatory topics that serve to address issues that are impediments to oil and gas exploration, development and production are of particular interest and should be pursued, whether under Section 999 or through other DOE programs. The objective of increasing domestic oil and gas reserves and production is in support of the principle metric used to evaluate the program.

2) <u>ISSUE #4: EXISTING FUNDING IS INADEQUATE:</u>

a) FINDING:

i) As has been pointed out in prior Advisory Committee recommendations, the funding of the Section 999 program is inadequate. Specifically, in 2008 the Committee recommended the following for annual funding levels and program duration:
   - o A one-year addition of a second $50 million (as proposed by H.R. 4156) and
   - o The ultimate amendment of Section 999 to raise annual funding to a total of $150 million from royalties, based on continuing program success.
   - o Congressional clarification that the "sunset" provision will last through at least 2017 (rather than being cut off in 2014).
   - o Ultimate amendment of Section 999 to extend the program funding and "sunset" provisions to 2030, based on continued program success.

b) RECOMMENDATION:

i) The increased funding levels as proposed by HR-4156 for an additional $50 million and ultimate increase of annual funding to a total of $150 million should be pursued by the Department of Energy and the Legislature.
   (1) This would allow the pursuit of additional R&D topics specifically focused on environmental and safety without detracting from the core elements of the existing program.
   (2) This would address the need for additional program elements to be described in new amended Legislation that would be necessary for the DOE to carry out the additional topics they have proposed for the 2011 Annual Plan.

3) <u>ISSUE #3: PROPOSED FOCUS ON REGULATORY LAWS AND ENFORCEMENT (Could be moved to Environmental & Regulatory Topic)</u>

a) FINDING:

i) The DOE has proposed the following as part of the 2011 Annual Plan: "Develop and analyze scientific data that can assist the Department of the Interior and other Federal and State regulatory authorities in evaluating the adequacy of existing regulations and the design of new regulations." The plan also provides that "a major goal of the 2011 research is to provide an additional quantitative basis for the creation and enforcement of appropriate regulations."
   (1) This is not a focus of the Research and Development (R&D) or Technology Transfer (TT) elements of the program as outlined in the Legislation. While regulatory oversight may be the result, this should not be the stated major goal of any R&D operation.
   (2) The evaluation of the adequacy of regulations and drafting of new regulations is a governmental function that is already provided for by other existing statutes and regulatory authority.
   (3) While we need more "science to inform the regulatory process", we must be mindful that "the regulatory process should not direct the science".

b) RECOMMENDATION:

i) The Annual Plan should not focus on regulatory issues, except as might be necessary to fund R&D and TT to ensure compliance with existing or proposed regulations.

ii) If the change in focus is to be carried out, then a change in the Section 999 Legislation would be necessary.
iii) R&D to better enable the industry to comply with the existing and new regulations is considered valid under the existing Section 999 Legislation in that it effectively increases oil and gas reserves and production.
iv) The existing state managed regulatory framework has proven to be sufficient and is adequate to manage the risks. We support continued management and enforcement at this level.
v) The Committee reaffirms the environmental recommendation made on the 2009 Annual Plan: "The Committee recommends that the DOE work with various parties including other federal agencies (this Committee recommends the inclusion of the Department of the Interior), industry, NGOs, state regulators, and others to explore/develop mechanisms to resolve…. conflicts. These mechanisms should more fully incorporate the industry's ability to effectively develop in an environmentally responsible manner founded on sound science." This was not meant to mean that there be a major change in the R&D focus to accomplish this.
vi) Much of the environmental and regulatory issues faced by producers are at the state level. The DOE pays little if any attention to these, whether in the individual states or through the IOGCC. By DOE taking an interest and helping to coordinate reasonable uniform policies, much could be accomplished. For example, in the mid-1990's DOE assigned "Outreach Coordinators" to work with oil and gas producers and state agencies in five geographic regions of the country to develop a more uniform and improved regulatory program for the petroleum industry; they were there to help solve problems. (An especially successful agent once said: "I am from the Federal government and I am here to help you." AND HE DID!) This practice should be reinstituted.

4) <u>ISSUE #2: INCREASED EMPHASIS ON GAS R&D:</u>
<u>(Could be moved to Research/Program Topic)</u>

a) FINDING:
i) The DOE 2011 Annual Plan places too much emphasis on gas shale plays.

b) RECOMMENDATION:
i) We do encourage DOE to promote gas as a fuel: shale gas is a world class game changing player and any gas has the added importance as a "bridge" fuel with its lower "carbon footprint".
ii) There is a need to bring balance in R&D for both "bridge" and "lower carbon footprint" fuels. Thus, R&D proposals that unlock "the light tight oil plan" (a form of the tight gas and shale gas) should be included. Likewise, R&D proposals that have the potential to change the game for unconventional oil and oil shale should be considered if they also support that vision.
iii) Mature oil fields should continue to be stressed as part of the small producer focus of the Sec. 999 legislation.

iv) The Annual plan should continue to address other unconventional resources as described in the Legislation, including but not limited to oil shale and mature oil fields.

5) ISSUE #5: ENVIRONMENTAL, HEALTH & SAFETY (HSE) (Could be moved to Environmental/Regulatory Topic):

a) FINDING:

i) The DOE 2011 Annual Plan with its change in focus to concentrate on environmental and safety concerns has been submitted out of sequence. It places expectations on the RPSEA Consortium and the expert Advisory Committees that are not appropriate and unwarranted:

(1) RPSEA was not given advance notice of the perceived need to change the focus of the plan. Thus, the RPSEA plan does not address the changes and whether or not they are appropriate. The RPSEA Technical and Advisory Committees have not had the opportunity to provide input on a new direction that is not in line with the past interpretation of the Section 999 Legislation.

(2) While the Secretary of Energy has ultimate authority and responsibilities under the Legislation ("Nothing in subparagraph (A) shall limit the authority or responsibility of the Secretary to oversee awards, or limit the authority of the Secretary to review or revoke awards."), the implementation of the program must still satisfy the elements as outlined in the Purpose and Focus of the program as contained in the Section 999 Legislation.

(3) While there has been a change in the direction and objectives of the current Administration, it does not give it authority outside of the limits of the existing legislation. If changes are to be made, then at the least they should involve input and full concurrence from all entities involved.

(4) The DOE raises as an issue the inexperience of the industry workforce as a cause for concern. This problem is not surprising given the 15 year depression that the industry endured from 1986 through 2000 during which over 350,000 oil field workers were laid off and the industry contracted. Simultaneously, funding for R&D and TT by both DOE and the industry was cutback: by the industry for lack of funds, and by the DOE because this was perceived as a mature industry that didn't warrant continued R&D investment. Nevertheless, entities such as the Petroleum Technology Transfer Council were created just to address these concerns.

b) RECOMMENDATION:

i) The Committee believes that additional elements of Environment, Health and Safety can be included in the 2011 Annual Plan under the current legislation provided that the program remains balanced and continues to address the key focus areas listed in Section 999.

ii) If the DOE 2011 Annual Plan is to be carried out as written, then the timeline should be re-started so as to give RPSEA the opportunity to address the change in focus in their plan recommendations.

iii) Given the extent of the major change in focus proposed, the Sec.999 Legislation would have to be amended; it is highly unlikely that this could be done given the difficulty of getting the original legislation passed as part of the 2005 Energy Policy Act.
iv) While we can agree that in light of recent incidents that more focus on environmental research is good, too much change is bad and would not be aligned with the intent of the legislation funding the program. "The program needs to be balanced."
v) Existing programs such as the Petroleum Technology Transfer Council (PTTC) should be used to provide continued education and training to the oil and gas workforce, especially for small to mid-sized independent producers who do not have access to resources that might provide this information.
vi) There are many environmental and regulatory issues that are current and future impediments to oil and gas production. Some of these could be addressed by specific R&D and TT programs.

6) <u>ISSUE #5: RESOLVING CONFLICTS OF INTEREST</u>
<u>(Moved from Environmental/Regulatory Sub-Group):</u>

a) FINDING:

i) On Page 24 (Organizational/Personal Conflict of Interest) the plans stipulates that RPSEA board members, officers, and employees who have financial interests in or financial relationships with applicants for or recipients of awards must recuse themselves from oversight of awards. To the extent that any research will help a company increase profits, anyone that has a financial interest in a company that might financially benefit from the product of the research might also have a conflict.

b) **RECOMMENDATION:** The policy should be amended to account fully for such conflicts.