Washington Call-up

April 1 -2, 2009

2009

INDEPENDENT PETROLEUM ASSOCIATION OF MOUNTAIN STATES

Briefing Book

IPAMS
Independent Petroleum Association of Mountain States

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Independent Petroleum Association of Mountain States (IPAMS)
2009 Washington Call-up
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For more information, please visit www.ipams.org.

Welcome to IPAMS 2009 Washington Call-up!

As we prepare to meet with our nation's policy makers, our industry is facing unprecedented financial and political challenges that highlight the need for a strong presence in Washington like never before. Your presence on Capitol Hill is now more important than ever as we have a unique opportunity to educate Members of Congress and the Obama Administration on the dangers of polices that adversely affect natural gas and oil development in the Intermountain West.

This Briefing Book is designed to assist you in answering any questions that may arise in your conversations with Members of Congress, their staff and media during the Call-up. We hope that this book will serve as a valuable resource in promoting the benefits of clean, domestic, affordable and abundant natural gas and the necessity of Western public lands to meeting our nation's energy challenges.

Our main message during the Call- up: Policies that make the development of natural gas more difficult (such as increasing taxes and regulations and further limiting access to public lands) will prevent President Obama and the 111th Congress from achieving their stated energy goals:

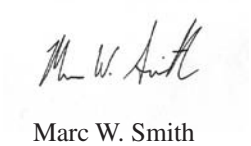
- **Increasing energy security**
- **Making renewable energy sources viable and affordable**
- **Addressing climate change**

All of the issues included here should be discussed within the context of promoting natural gas as an energy resource that is necessary to achieving these goals.

Coupled with the IPAMS brochure, which we encourage you to leave behind, we hope that this Briefing Book will provide you with the information you need to make compelling argument for policies that will help us to further increase supplies of natural gas and oil from the Intermountain West. Of course, there will undoubtedly be questions that arise which are not covered here. Please let Kathleen Sgamma or Jon Bargas know of any questions from your meetings on the Hill that you do not feel comfortable answering or requests for additional information, and they will follow up with the Member and their staff.

We offer our heartfelt thanks to you for joining us on the Call-Up and giving your time to IPAMS' single most important annual effort. Please do not hesitate to contact me if I or any of the IPAMS staff can be of assistance to you in any way during your stay here in Washington.

Sincerely,



Marc W. Smith
Executive Director

Increasing Energy Security

- *Approximately 97% of natural gas consumed everyday in our country is produced right here in North America. The U.S. is not presently dependent on foreign sources of natural gas as it is on oil. If, however, new policies discourage domestic natural gas exploration and production, the U.S. could soon be as dependent on foreign natural gas as it is on foreign oil.*

- *Already there is talk of a natural gas cartel composed of countries such as Iran, Russia, and Qatar that could cause further harm to our energy security if we fail to maintain our natural gas independence.*

Ranking of Natural Gas Proved Reserves:[1]

1. Russia
2. Iran
3. Qatar
4. Saudi Arabia
5. United Arab Emirates
6. United States

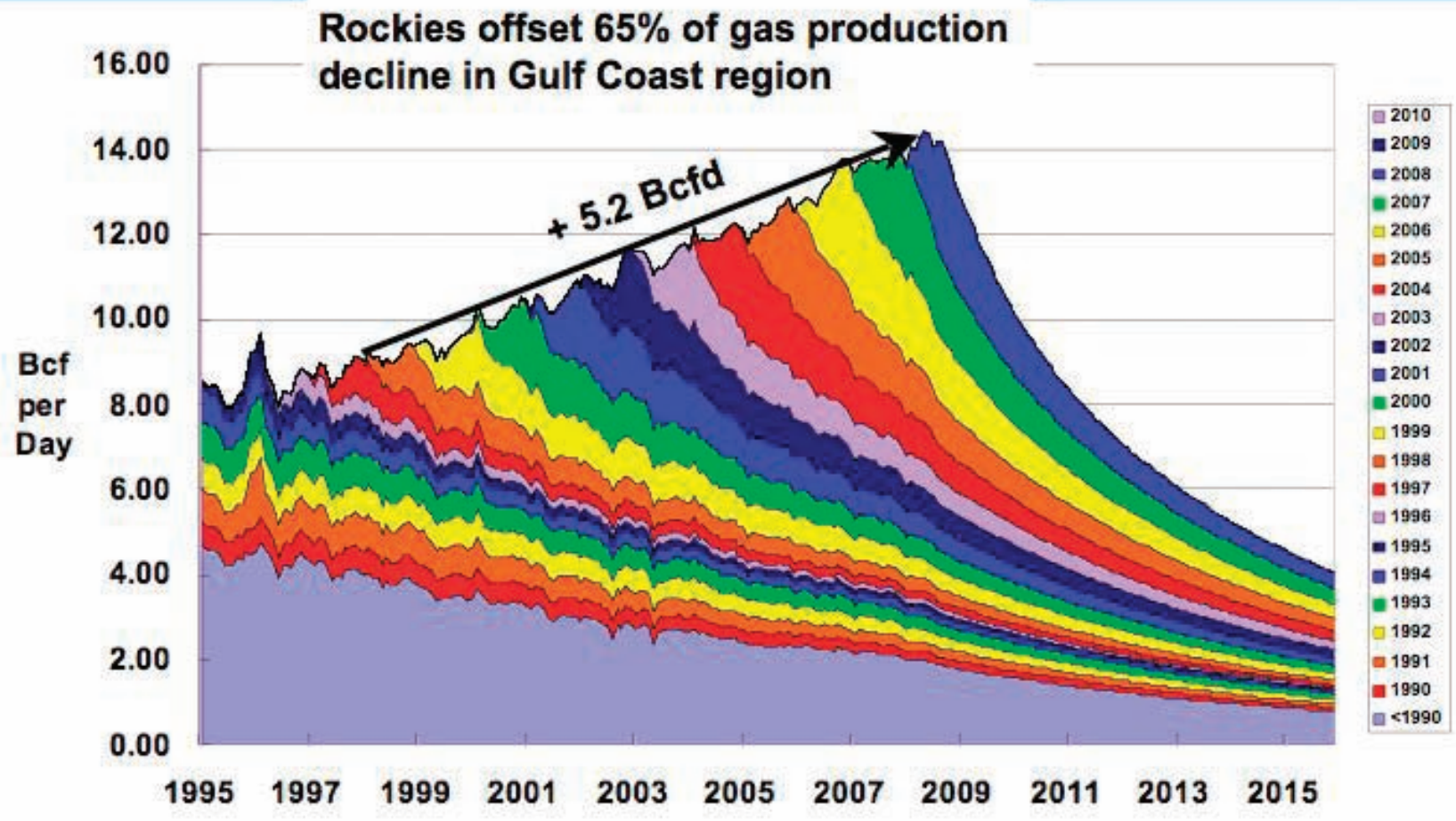
Drilling New Wells on Public Lands is Essential to Maintaining our Natural Gas Independence

- Unlike other energy producers, natural gas companies in the Intermountain West don't need special subsidies, but they do need a predictable regulatory and tax structure in order to make long-term investment decisions that ensure uninterrupted supply. Drilling new wells is critical to maintaining supply. To highlight this point, consider the fact that 22% of the natural gas we use today comes from wells completed during the past 12 months. According to industry analysts, natural gas drilling in the Intermountain West will need to increase by 75% over the next 10 years just to sustain current production levels.

- Currently the Intermountain West supplies 27% of America's natural gas. Since over 50% of the region is publicly owned, public lands are essential for ensuring supplies of American natural gas. Of the 262 million acres that BLM manages, only 26.1 million acres (less than 1%) are disturbed for with natural gas and oil activity.

[1] CIA World Fact Book

Rocky Mountain Region
Vintage Production Profile



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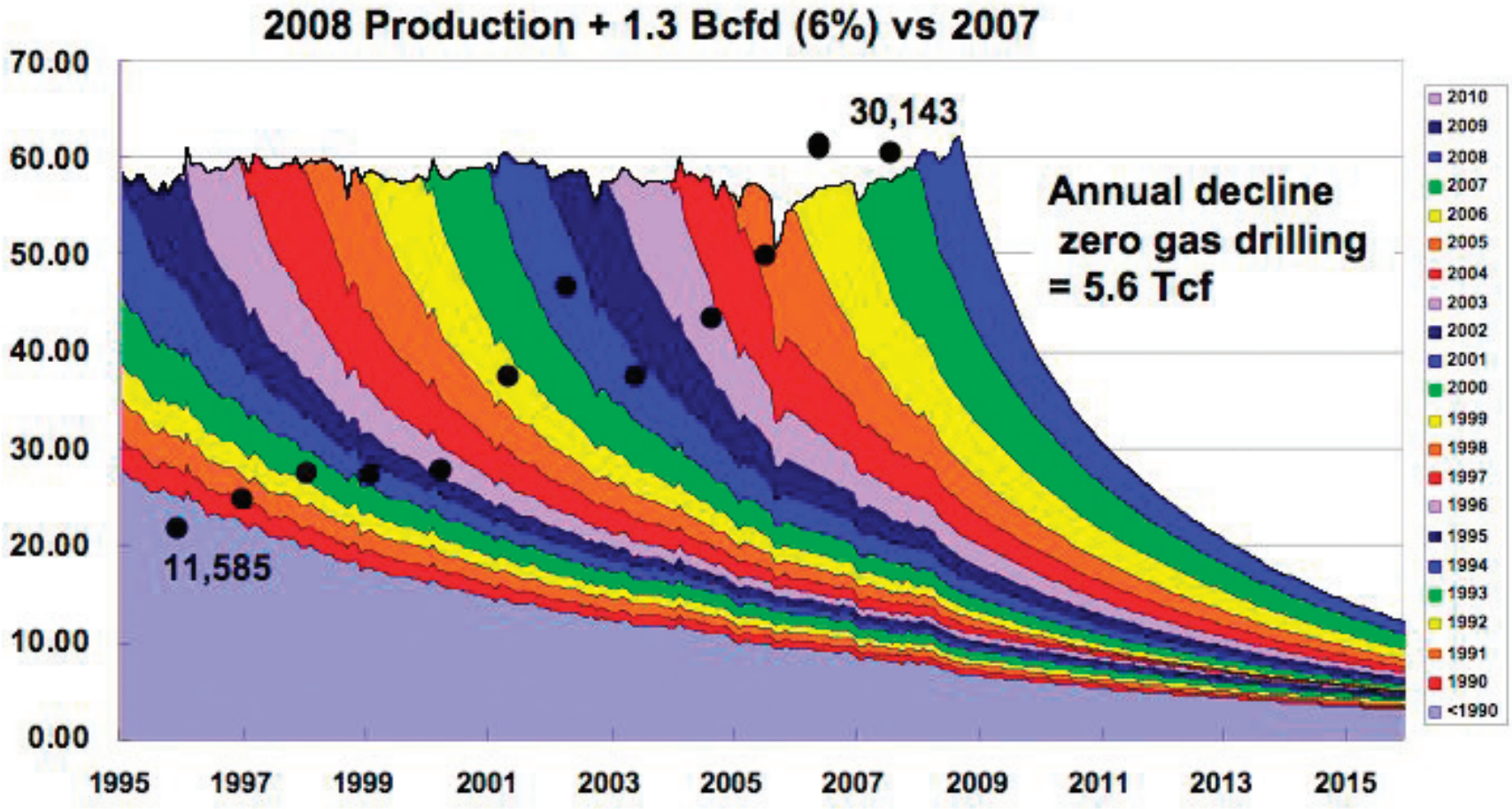
U.S. Vintaged Gas Production 1995 – 2008



1

Natural Gas as Backup for Wind & Solar

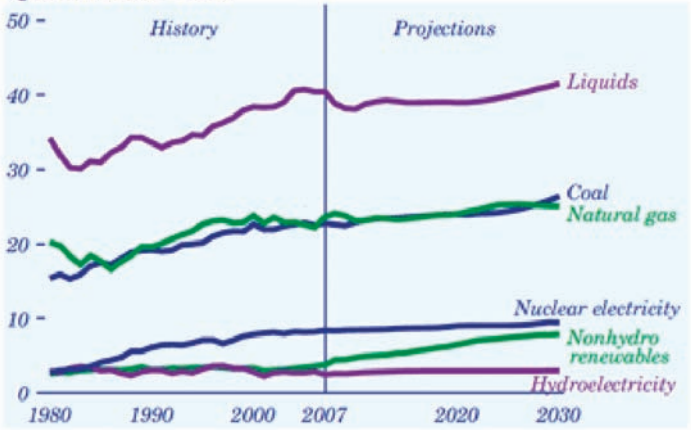
- *Natural gas doesn't compete with renewable energy. In fact it helps make the vision a reality. Greater energy production from intermittent sources of power like wind and solar are possible because natural gas electric generation is available to fill-in during the large gaps of time when the wind isn't blowing and the sun isn't shining. Solar and wind facilities simply cannot exist without increased supplies of natural gas.*

- *Converting entirely to renewable energy can't happen overnight. Renewable sources of energy make up only a tiny fraction of electrical power today (wind produces 0.77 percent of the total electrical power supply and solar produces 0.01 percent of the total electrical power supply). As more energy comes from these renewable sources, however, more natural gas will be needed to back it up.*

- *Fossil fuels currently provide more than 85% of all energy consumed in the US, including nearly 2/3 of electricity and virtually all transportation fuels. The U.S. Department of Energy estimates that by 2030, 25% of our energy will come from natural gas (an increase of 5% over 2008), and about 8% will come from renewable sources.*

- *Wind and solar are only able to meet demand for electricity, not for heating homes or transportation. If technological advances in electric vehicles are made, wind and solar could account for some percentage of transportation as well, but only with a significant and costly expansion of transmission infrastructure. Without those substantial expenditures, electric vehicles will be run primarily on electricity generated by coal and not clean energy.*

Figure 3. Energy consumption by fuel, 1980-2030 (quadrillion Btu)



Source: U.S. Energy Information Agency

Reducing Greenhouse Gas Emissions

◆ *As the cleanest burning fossil fuel, natural gas will also play an increasingly important role in a carbon-constrained world as an essential part of any plan to reduce greenhouse gas emissions. Natural gas emits just over half the CO_2 of coal, and recent studies predict that increased supplies of natural gas will be needed in order to implement any of the climate change policies under consideration today.*[1]

Pounds of Air Pollutants Produced per Billion Btu of Energy

	Natural Gas	Oil	Coal
Carbon Dioxide	117,000	164,000	208,000
Carbon Monoxide	40	33	208
Nitrogen Oxides	92	448	457
Sulfur Dioxide	0.6	1,122	2,591
Particulates	7	84	2,744
Formaldehyde	0.750	0.220	0.221
Mercury	0.000	0.007	0.016

Source: EIA—Natural Gas Issues and Trends

◆ *If Congress increases the demand for natural gas by moving forward with cap and trade legislation to reduce CO_2 emissions, it should carefully consider policies that ensure timely access to some of the most promising areas for future supply. Congress must reverse policies that create bureaucratic delays, limit access to federal lands, and increase costs, since these misguided policies only serve to deepen our nation's energy challenge.*

◆ *Policies that intentionally place limits on the development of new supplies of natural gas from onshore and offshore federal lands are counterproductive to the goals of reducing the carbon intensity of our economy. It is reckless to promote plans that are designed to fail. If we increase demand for natural gas, we need corresponding policies that plan for the development of new supplies.*

1. U.S. Energy Information Agency. Energy Market and Economic Impacts of a Proposal to Reduce Greenhouse Gas Intensity with a Cap and Trade System. January 2007; Science Applications International Corporation (SAIC). Greenhouse Gas Initiatives Analysis using the National Energy Modeling System. October 2007.

Energy Development on Public Lands

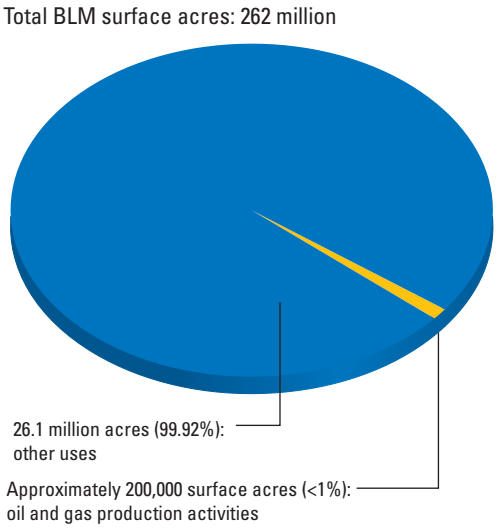
Small and Temporary Impact

The Intermountain West produces 27% of our nation's natural gas while impacting less than 1% of public lands

America's independent natural gas producers deliver clean energy to Americans while complying with literally thousands of local, state, and federal regulations.

- New and emerging technologies such as directional drilling allow responsible development to occur with little impact to the environment and wildlife.
- Very little land is needed to produce natural gas. Three hundred acres of windmills or forty-six acres of solar panels are needed to generate the equivalent amount of energy produced by a natural gas well that disturbs less than five acres of land.
- On the less than 1% of federal lands where production exists, public lands are still available for other multiple uses such as recreation and hunting.
- As the graph below illustrates, oil and natural gas production occupies much less acreage than other land use designations in the West.

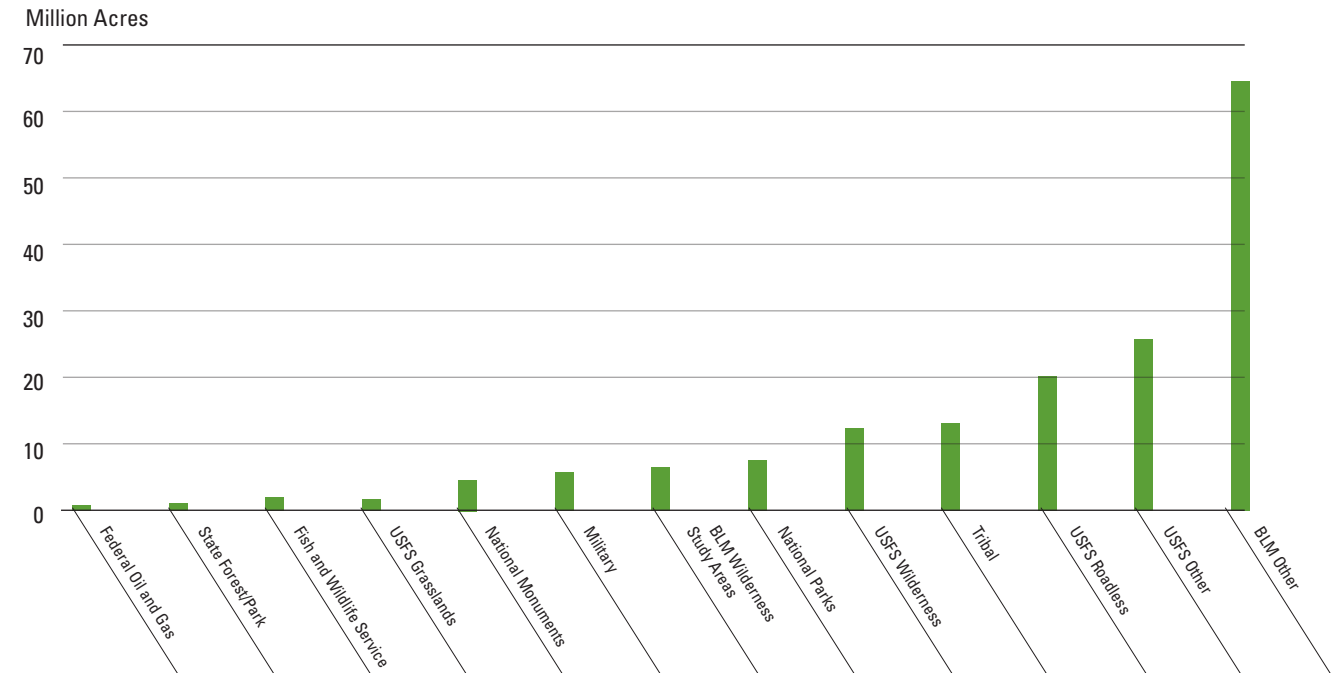
Oil and Natural Gas Activities on Public Lands



Oil and natural gas production is found on *less than one percent* of the 262 million acres of federal lands controlled by the Bureau of Land Management (BLM).

Source: U.S. Bureau of Land Management

Federal Land Uses Compared with Oil and Gas Operations

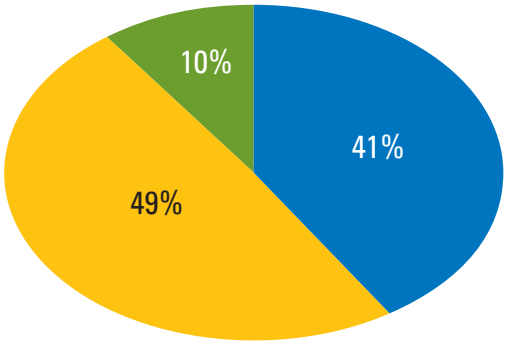


Source: U.S. Bureau of Land Management

- The federal regulatory process holds up exploration and development of oil and gas leases. In some cases, the process to acquire the lease and permits, coupled with seasonal closures, can delay exploration for 5 or more years. Thus, producers may not be able to drill the first test well, let alone a producing well, until the end of their lease term.
- In a coordinated effort to "lock up" America's oil and natural gas reserves, activist groups have filed a record number of lawsuits to delay and halt new energy supplies. This means more taxpayer dollars are spent fighting litigation and federal officials have less time to do their jobs, such as environmental enforcement.
- The National Petroleum Council has estimated that more than 200 Tcf of natural gas has been "locked up" under federal land nationwide. New supplies of natural gas could meet the future demands of U.S. consumers and save them $300 billion over the next 20 years from estimated decreases in energy prices. As the largest onshore source of natural gas in America, public lands represent a near-term solution to increase energy security.
- According to the Energy Policy Conservation Act (EPCA) Phase III Inventory completed in 2 008 by DOI, USGS, USDA Forest Service, and EIA, approximately 95 Tcf of natural gas and 19 billion barrels of oil on federal lands are off-limits to production.

Intermountain West Inaccessible Natural Gas

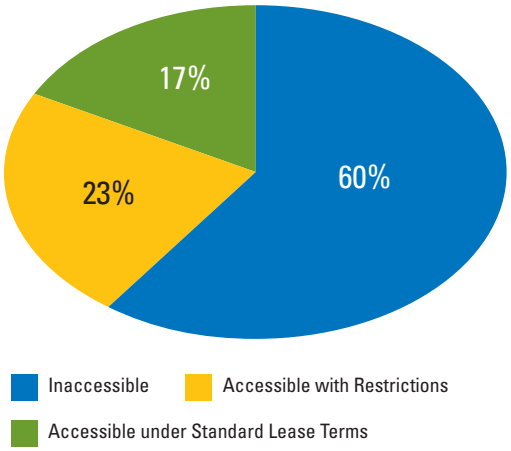
Natural Gas (231 Trillion Cubic Feet [Tcf])



* Federal natural gas and non-Federal natural gas underlying Federal land

Intermountain West Federal Acreage Off-Limits to Natural Gas and Oil Development

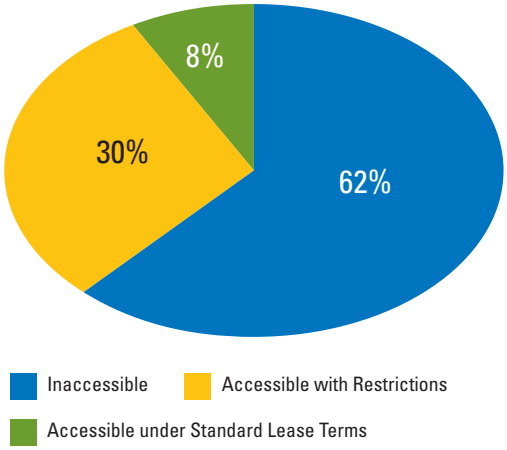
Acreage (279 Million Acres)*



* Federal land and lands overlying Federal mineral estate

Intermountain West Inaccessible Oil

Oil (31 Billion Barrels [BBl])



* Federal liquids (oil and natural gas liquids) and non-Federal liquids underlying Federal land

Source: Energy Policy Conservation Act (EPCA) Phase III Inventory, 2008, DOI, USGS, USDA, Forest Service, DOE, and EIA

Leasing in the Intermountain West

- *Energy is a matter of national security: the nation needs all the resources it can get.*
- *The process to approve oil and gas projects is cumbersome and time-consuming, often taking over five years before an operator can even begin exploratory drilling.*
- *After taking considerable financial risks and exploring a lease, an operator may not discover any oil or natural gas and lose all the investment.*
- *Environmentalists and other obstructionist groups work to slow every step of the process.*
- *Proposals to reduce the lease period to five years from ten or increase rental fees will de-incentivise industry to produce American energy and will decrease our energy secutiry.*

Details

- Oil and gas development in the Rockies is a highly competitive business. Hundreds of companies own leases and are competing at every stage of the process – from lease bidding to producing energy resources. Companies are not coordinating to hold back production and drive up prices. Rather, they are working as hard as possible to develop vital domestic energy resources, create jobs, earn a return on their investment, and provide value to demanding shareholders.
- A lease is only a rental agreement with no guarantee that the leased area contains any oil or natural gas. In fact, most leased areas do not contain oil and gas in commercial quantities.
- Companies pay for the right to explore on leased land. Over the past five years, the industry has paid billions of dollars into the U.S. and state treasuries to obtain leases. Each lease is an at-risk investment, with no guarantee that it will return any revenue to the leaseholder.
- After acquiring a lease, companies may have to spend several years acquiring other surrounding leases to ensure a sufficient acreage block to make exploration and production worthwhile. At every step of the process, environmental and other obstructionist groups throw up road blocks. Practically every lease sale in the Rockies is protested by special interest groups. In fact, ***protests of leases in the Rockies have risen from 27% of all leases in 2001 to 81% in 2007. In 2008, 100% of lease sales were protested.*** This means that many acres may sit idle while a company works to overcome these lease protests and acquire sufficient acreage in a particular area to commence drilling.
  - In Colorado in 2007, 292% of leases offered were protested. That number is over 100% because environmental groups are so successful that federal land managers have pulled 708 parcels and only offered for lease 369.
  - In 2007, 188% of parceals in Montana were protested, with 1,184 protested parcels resulting in only 631 offered.
  - In Utah, the BLM has suspended vast acreage because of citizen-proposed wilderness areas. BLM estimates that $60 million in rents and bonuses are being held by the government for lands that operators are not allowed to develop, despite the fact that many of the proposed wilderness areas fail to meet the criteria for wilderness-quality lands.

- Across the Intermountain West, over 7.2 million acres have been deferred from leasing for more than a year.
- Obstructionist groups have started to protest several lease sales in the Rockies on the basis of climate change, despite the fact that carbon dioxide is not regulated under the Clean Air Act and there is no scientifically-based method for modeling and evaluating the contribution of oil and gas production emissions to global warming.

◆ The risk a company takes when acquiring a lease is substantial, and exploration and development take significant time. In order to develop a lease, operators must take many steps including: permitting and conducting seismic surveys; performing technological and engineering assessments; conducting environmental analyses under the National Environmental Policy Act (NEPA); obtaining drilling and rights of way permits; obtaining rigs; arranging logistics; drilling; building pipelines, gas plants, and other infrastructure; and finally producing the oil or natural gas. The entire process can take as little as a few years, and as many as ten years.

- Environmental Analyses (EA) for exploration and small development projects often take upwards of three years, despite CEQ guidance that they should take three months.
- Environmental Impact Statements (EIS) for large development projects have lately been taking as much as five or six years despite CEQ guidance of one year.
- Resource Management Plans (RMP), particularly in Utah, have taken over seven years, thereby holding up exploration and production in new prospective areas.
- These long time periods for NEPA documentation make a mockery of Congressional proposals to limit lease terms to five years. If those proposals go forward, they should be amended to include a provision that oil and gas EAs become automatically approved in six months, and EISs in two years.

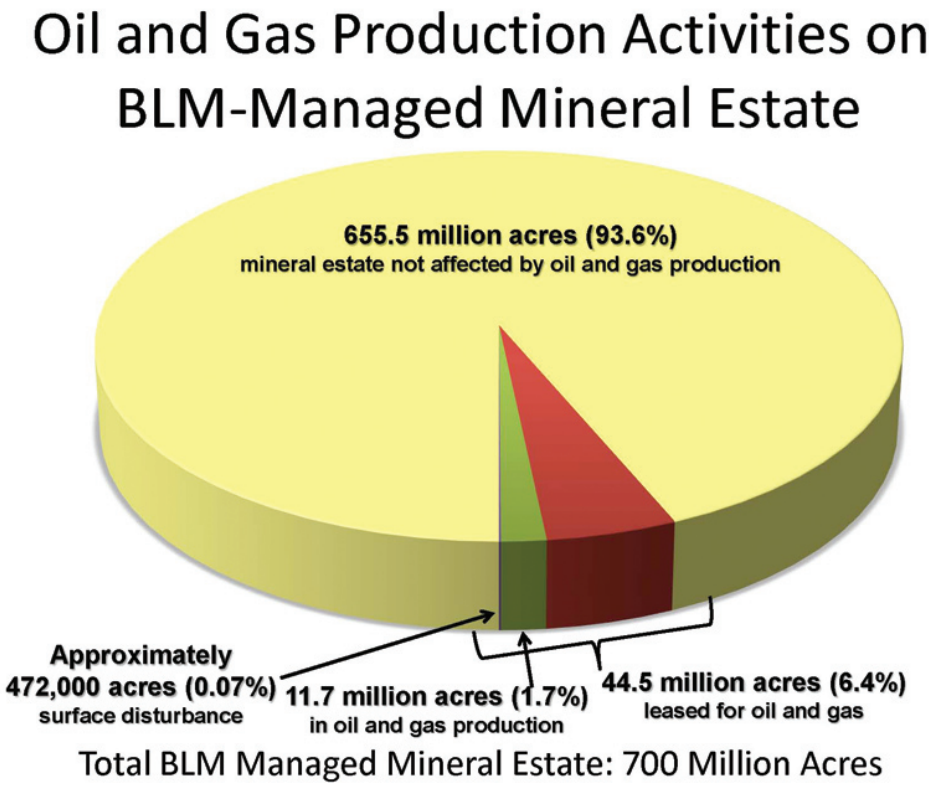
◆ When Members of Congress and environmental groups talk about the 30 million leased acres supposedly sitting idle, they show no knowledge of the fact that the process the government has established to approve and permit oil and natural gas projects is cumbersome and extremely time consuming. The reason so much of the leased acreage is not producing currently is because the operator is engaged at some stage of the process and cannot start producing until jumping through all the legal and regulatory hoops.

◆ Over 18 million acres in the Rocky Mountain West have been leased within the last five years. Given the extensive regulatory processes that must be completed and the efforts of obstructionist groups to block oil and gas activities, it's not surprising that many aren't producing energy yet.

◆ A substantial portion of leased acreage is explored and determined not to have economic quantities of energy resources. In those cases, the leases expire after ten years, the company forfeits all the money invested, which can be millions of dollars, and the land remains undisturbed.

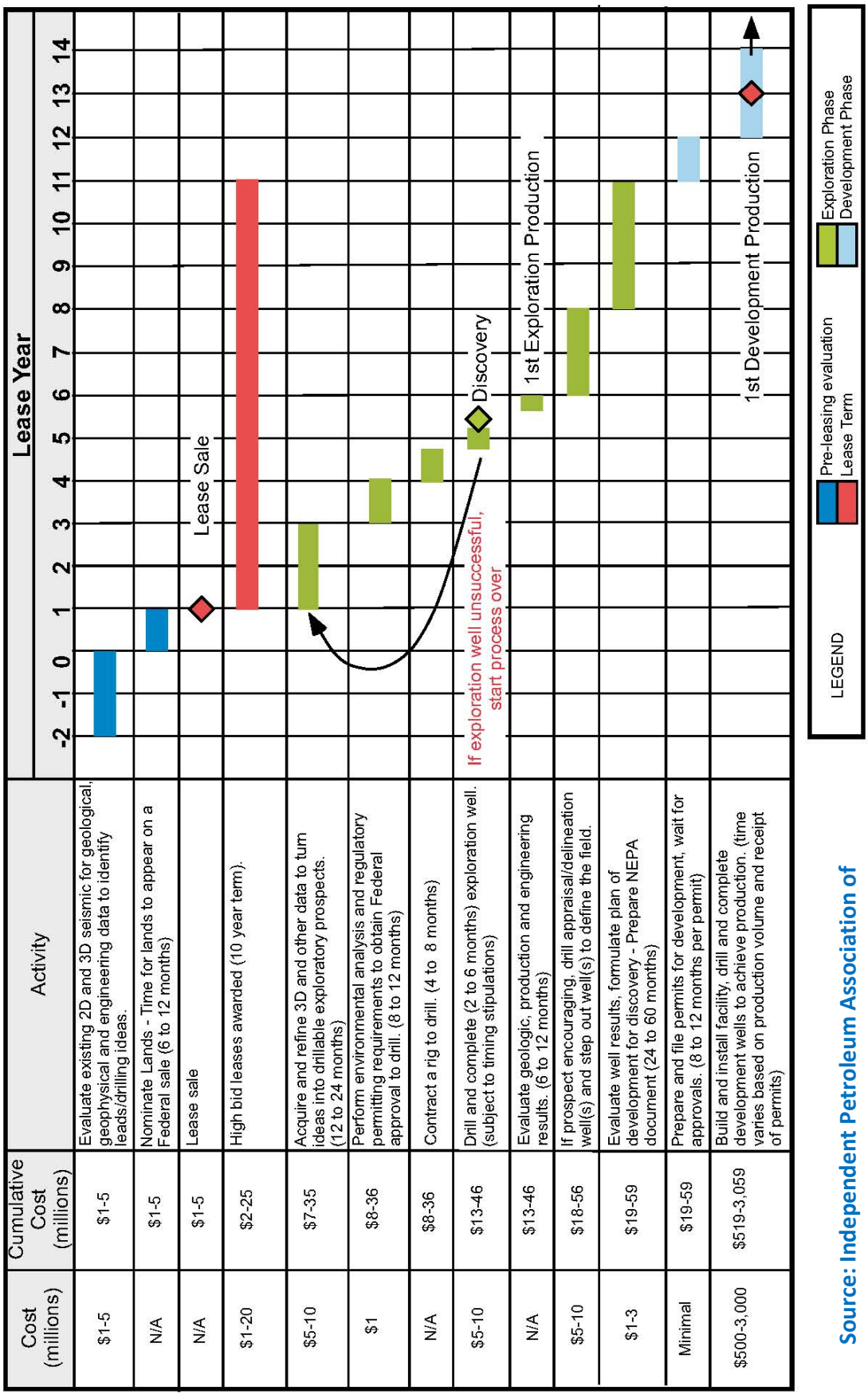
◆ The United States needs all the energy it can get from all energy sources. The U.S. is the only major-oil producing country that places huge reserves off limits to development. Unlocking these vast resources is a matter of national security.

- New discoveries such as the Bakken in the Williston Basin of North Dakota and Montana have resulted in new reserves that were not available even five years ago. By making lands available in the Intermountain West, the government could take positive steps to increase the energy independence of the U.S. and unleash the technical and creative power of the industry to make similar discoveries.
- Many environmental and other obstructionist groups present oil and gas development as an "either or choice" with respect to the environment. IPAMS believes this is a false choice: we can and are responsibly developing our energy resources and protecting the environment at the same time.
  - Oil and gas operators in the Rockies are stewards of the land, and strive to ensure that their impact is minimal. Advances in technology such as directional drilling continue to reduce the surface disturbance, while new control technologies reduce impacts to air quality, and recycling and treatment technologies reduce the impacts to water quality.
  - The impacts of oil and gas development are temporary and the land is returned to its original state, so much so that thousands of acres in the Intermountain West with active and abandoned wells have been proposed as wilderness in bills before Congress.
  - Leased lands are not locked up. Under the Federal Land Policy and Management Act (FLPMA), leased federal acreage remains open to multiple uses such as recreation and livestock grazing.



Source: U.S. Bureau of Land Management

Federal Onshore Lease - Exploration & Potential Production Time Line



Cost (millions)	Cumulative Cost (millions)	Activity
$1-5	$1-5	Evaluate existing 2D and 3D seismic for geological, geophysical and engineering data to identify leads/drilling ideas.
N/A	$1-5	Nominate Lands - Time for lands to appear on a Federal sale (6 to 12 months)
N/A	$1-5	Lease sale
$1-20	$2-25	High bid leases awarded (10 year term).
$5-10	$7-35	Acquire and refine 3D and other data to turn ideas into drillable exploratory prospects. (12 to 24 months)
$1	$8-36	Perform environmental analysis and regulatory permitting requirements to obtain Federal approval to drill. (8 to 12 months)
N/A	$8-36	Contract a rig to drill. (4 to 8 months)
$5-10	$13-46	Drill and complete (2 to 6 months) exploration well. (subject to timing stipulations)
N/A	$13-46	Evaluate geologic, production and engineering results. (6 to 12 months)
$5-10	$18-56	If prospect encouraging, drill appraisal/delineation well(s) and step out well(s) to define the field.
$1-3	$19-59	Evaluate well results, formulate plan of development for discovery - Prepare NEPA document (24 to 60 months)
Minimal	$19-59	Prepare and file permits for development, wait for approvals. (8 to 12 months per permit)
$500-3,000	$519-3,059	Build and install facility, drill and complete development wells to achieve production. (time varies based on production volume and receipt of permits)

Source: Independent Petroleum Association of Mountain States (IPAMS)

"Use It or Lose It"

- *So called "Use it or Lose it" legislation from Congress is based on the criticism that the natural gas and oil industry is not diligently developing the 68 million acres currently leased.*

- When Congress and environmental organizations talk about leased acres supposedly sitting idle, they show no knowledge of the fact that the process to approve and permit oil and natural gas projects is cumbersome and extremely time consuming. Much of the leased acreage is not producing currently because operators are engaged at some stage of the process and cannot start producing until jumping through all the legal and regulatory hoops.
- This is a classic Catch-22 situation…
  - Whereby the government has created a cumbersome permitting and environmental review process that takes years to complete
  - Obstructionist groups exploit the process to throw up legal roadblocks at every stage
  - And both turn around and blame the industry for not diligently drilling.
- Recently, the Interior Department Inspector General released a report[1] that illustrates why "Use It or Lose It" proposals being considered by Congress are not feasible. These proposals include increasing fees on non-producing leases.
  - The DOI IG concluded that DOI cannot compel companies to develop leases because of lack of statutory authority, lack of policies for tracking activity, lack of data, and incompatible systems between MMS and BLM.
  - The report cautioned that mandating production on federal leases or increasing lease fees would not enhance production, but could de-incentivize industry.
  - The DOI IG found that because of severe data integrity problems, they cannot say with any certainty how many leases are producing. The oft-repeated statistic that 60% of leases are not producing is not backed by any credible data.
  - Inconsistencies between MMS and BLM mean that leases identified by BLM as producing may be reported as non-producing by MMS, and vice versa.
  - Companies are correctly reporting their royalties, but DOI systems are not adequate for determining the correct level of royalties. The DOI IG cites an example were a company reported over $6 million in royalties, but BLM and MMS, if left to their own devices, would not have collected those royalties.
  - DOI does not track data on the full range of activities that are occurring on leases, such as geophysical exploration, environmental analyses, permitting, wildlife and cultural resource surveying, and the numerous other activities necessary before a well is drilled.
  - For 99% of leases in their primary terms, DOI simply does not monitor to ensure due diligence.

[1] *Oil and Gas Production on Federal Leases: No Simple Answer,* U.S. Department of the Interior, Office of Inspector General, Royalty Initiatives Group, February 27, 20009.

◆ IPAMS Recommendations:

- DOI must first solve their data problems before they can determine which leases are in a producing status.
- Congress should not penalize industry for a government problem. Without having the information to determine if a lease is producing or not, how can DOI levy additional fees for non-producing leases?
- When fixing its data systems, DOI should ensure the collection of information about all activity on leases, from exploration and environmental analysis to permitting and production. IPAMS welcomes the opportunity to work with DOI on specifying those activities.
- Any "Use It or Lose It" legislation should be focused on fixing the data problems before imposing any measures such as increased fees or reduced lease terms.
- Congress could also increase American energy security by passing legislation to remove roadblocks to natural gas and oil production on public lands in the Intermountain West, such as:
  - Ensuring federal land managers follow the CEQ Guidelines for completing NEPA (three months for Environmental Analyses, one year for Environmental Impact Statements)
  - Ensuring the BLM issues permits within the EPAct 2005 mandated timeframe of 30 days
  - Controlling frivolous protests and legal challenges designed to slow natural gas and oil development.

A natural gas and oil lease is a ***definite maybe ….***

- Maybe you'll get through all the environmental analyses and regulatory hurdles
- Maybe you'll get permission to drill
- Maybe your project won't be held up by legal challenges from obstructionist groups
- Maybe you'll find oil or natural gas.

But companies ***definitely*** have to pay, potentially millions of dollars.

- Over the past five years, the industry has paid billions of dollars into the U.S. and state treasuries to obtain leases. Each lease is an at-risk investment, with no guarantee that energy resources will be found or that it will return any revenue to the leaseholder.
- Companies pay a per-acre rental fee and bonus, and annual rental. No matter how long it takes to get through the permitting process, companies must pay annual rental fees.
- In Utah alone, companies have paid an estimated $60 million on leased acreage that they are unable to explore and develop because of legal challenges. 500 leases in Montana have been held in abeyance since 1985 pending NEPA study challenges from special interest groups.

Utah Resource Management Plans

- *The Bureau of Land Management (BLM) properly analyzed the impacts of leasing lands within Utah for oil and natural gas development in the six Utah Resource Management Plans (RMP), and the RMPs do not need to be reopened. Utah BLM properly applied NEPA, FLPMA, and NHPA in its seven year planning process.*

- *If the current RMPs are rescinded and new Plan amendments initiated, land management will revert to the old, 1980's era RMPs which contain considerably fewer environmental protections for all resources.*

- *Criticism that BLM should have conducted quantitative ozone modeling for the RMPs fails to recognize that BLM will address these site-specific air impacts in further NEPA analysis before significant natural gas and oil development proceeds.*

- *Any perceived deficiencies in the Utah RMPs should be addressed by targeted supplementation to the RMPs with additional analysis, not a full-scale rewrite to a process that has already cost US taxpayers $35 million and taken seven years.*

Resource Management Plans

- The Utah RMPs, which formed the basis for the December Utah lease sale, comply with the National Environmental Policy Act (NEPA), the Federal Land Policy and Management Act (FLPMA), and the National Historic Preservation Act (NHPA) in their analysis of air quality, cultural resources, wilderness characteristics, and other natural resources potentially impacted by the decisions in the RMPs.

- The RMPs are the result of a $35 million seven year public and open process in which everyone – environmental organizations, federal and state agencies, Tribes, and the general public – had ample opportunity to comment. From 2001 to 2008, BLM accepted and analyzed over 185,000 public comments and over 100 meetings with federal, state and tribal agencies. The State of Utah reviewed and the Governor signed off on the final RMPs.

- BLM, with input from these entities, used the best available science in the analyses, and put in place extensive environmental protections for wildlife, wilderness characteristics, cultural, air, water, and other resources. The RMPs are the most environmentally protective management plans ever developed by Utah BLM.

- In the RMPs, BLM managed to balance several multiple uses and competing interests, from natural gas development to OHV use and wilderness. The RMPs represent a compromise in which no single special interest group received 100% of what they wanted. Despite BLM's careful balancing of these multiple uses, those demanding further restrictions such as the adoption of the "citizen proposed wilderness areas" refuse to acknowledge or accept this balance.

- Meeting all the demands of organizations advocating for wilderness would result in 39% of Utah's total surface area being closed to economic development other than primitive recreation. Currently in Utah 12 million acres (22%) in parks, monuments and wilderness areas are already off limits to economic development, and proposals are in place for an additional 9.4 million acres (17%) off-limits to multiple-use economic activity.

- Any perceived deficiencies in the RMPs should be addressed with supplemental analysis tailored to address those perceived deficiencies such as air quality, not through a complete rewrite. If the current RMPs, which were signed in the autumn of 2008, are rescinded and new documents initiated, land management would revert to the previous RMPs which had considerably fewer environmental protections for all natural resources.
- Rescinding the RMPs would negate a $35 million, seven year federal process and the investment of countless hours of time by many stakeholders and cooperating agencies. If the current RMPs are rescinded and new Plan amendments initiated, land management will revert to the old, 1980's era RMPs which contain considerably fewer environmental protections for all resources. In some field offices, such as Price, the up-to-date RMPs would revert to an even less comprehensive management framework plan document.
- Rescinding the RMPs would remove the additional protections for wilderness characteristics areas, the Travel Management Plans and Areas of Critical Environmental Concern (ACECs) adopted by the Records of Decision (ROD) for the new RMPs. For example, if the current RMPs are rescinded, BLM could not manage over 446,000 acres non-wilderness lands for wilderness character and could not close 3.9 million acres to cross-country OHV use until new plans are completed, which would take several years.
- There is no need to conduct another Wilderness Inventory. In the RMPs, BLM analyzed over 2.8 million acres of lands with potential wilderness characteristics. BLM utilized results from the 1999 BLM Wilderness Reinventory conducted under the Clinton Administration and information collected from environmental organizations and the public. As part of this process, BLM verified the accuracy of the information presented. The extensive level of effort precludes the need for an additional wilderness reinventory process.
- In the extensive planning process, BLM fully analyzed the lands to be made available for oil and natural gas leasing. No new acreage was opened to leasing that was not available before the recently revised RMPs, and no lands have fewer restrictions than before. BLM placed greater restrictions on both the amount of lands available for leasing and the activities that may be conducted on those leased lands than the original RMPs/management plans. In other words, the original management plans allowed more leasing on more acres with less restrictions than the newly revised RMPs.
- Of the 22.9 million acres that BLM manages in Utah, about 4.5 million acres are currently under lease compared to the 20 million acres under lease in 1984. Actual surface disturbance on those leases is about 31,000 acres, considerably less than 0.1% of BLM managed lands. Despite that small impact, BLM in the recently completed RMPs put three million acres off-limits to or severely restricted development with No Surface Occupancy (NSO) designation.

Air Quality

- Requests by the Environmental Protection Agency (EPA) and environmental organizations that BLM conduct large-scale regional ozone modeling at the RMP stage go beyond the requirements of NEPA and can place BLM in the role of administering the Clean Air Act (CAA) – a role that should remain with agencies, like Utah Division of Air Quality (UDAQ) and EPA, with the proper technical expertise and authority to regulate emissions that contribute to ozone pollution.
- Criticism of the RMPs focuses on air quality and the assertion that NEPA requires quantitative ozone modeling at the RMP stage. This type of analysis is more appropriate at the project development stage, when the sources and locations of emissions that could lead to ozone formation have been identified and can be better quantified. Analysis of quantitative ozone modeling at the planning stage could result in significant expense

without providing useful information to decision-makers as to the potential impacts and mitigation mechanisms. BLM has met its obligations under NEPA by analyzing impacts to air quality using the best information available and conducting more detailed analyses at the appropriate time.

- NEPA does not prohibit impacts, but rather directs that the impacts be analyzed and disclosed. BLM has done that in the RMPs. Under the Clean Air Act, Utah's Division of Air Quality (UDAQ) and the EPA have the authority to enforce air quality standards in the State of Utah.
- Calls by the EPA and others for BLM to conduct large-scale regional ozone modeling goes beyond the requirements of NEPA and places functions on federal land managers which are better done by agencies with the proper technical expertise.
- IPAMS has taken the proactive action of funding a comprehensive air modeling analysis in the Uinta Basin, the primary oil and natural gas producing area in Utah, called the Uinta Basin Air Quality Study (UBAQS). IPAMS hired Environ, respected for their air quality expertise by BLM, the Western Regional Air Partnership (WRAP), state regulators, and others to conduct a detailed oil and gas emissions inventory and the modeling. IPAMS worked with multiple government stakeholders – EPA, BLM, USDA Forest Service, Tribes, WRAP, National Park Service and other – on the technical details of the project, including the modeling protocol.
- The results of UBAQS will be available in April 2009, and can be used for project-level NEPA analyses or any necessary supplement to the RMPs to indicate potential impacts to ozone from oil and gas development. UBAQS will provide BLM, EPA, Tribes, and the State with an unprecedented level of region-wide air quality analysis on all sources in the basin as well as the cumulative impacts of oil and natural gas development.
- The Uinta Basin has not been designated as a non-attainment area for any National Ambient Air Quality Standards (NAAQS), and development should not be curtailed in speculative anticipation of an exceedance in the future. This is particularly true given the significant number of mitigation measures that can be implemented by either the air quality regulatory agencies (UDAQ and EPA) or BLM to reduce emissions from oil and gas development activities to maintain attainment for ozone in the Uinta Basin.
- BLM has also received criticism for failing to analyze impacts from natural gas and oil development on climate change. In the RMPs, BLM correctly determined that until EPA provides a regulatory protocol or emissions standards regarding greenhouse gas emissions, it would not be able to conduct the level of analysis demanded by some organizations. Until expert climate change scientists develop the tools necessary to quantify the impacts of oil, natural gas, and other development, it seems unreasonable to require federal land managers to do so.

Utah Economics

- Oil and natural gas development is a major component of the Utah economy. At a time when the federal government is spending $780 billion to stimulate the economy, it seems the Department of Interior is contemplating policies that jeopardize hundreds of millions of dollars of private sector stimulus from oil and natural gas development in Utah.
- The American Recovery and Reinvestment Act of 2009 is supposed to create 3.5 million jobs nationally, 32,000 in Utah.[1] According to the University of Utah, oil and natural gas in Utah already employs directly and indirectly about 11,000 workers today in Utah.[2] Policies that restrict public lands access or significantly curtail development will put jobs in jeopardy and could cancel out federal economic stimulus efforts.
- Utah is ranked 50th in the amount of stimulus spending per capita.[3] Even the amount of the one-time stimulus funding designated for Utah - $4.1 billion - pales in comparison to the $2.9 billion the oil and gas industry provides in private sector funding to Utah *every year*.[4] In 2007, industry provided over $315 million in taxes and royalties to the state.
- A recent University of Utah study shows that in the Uinta Basin alone, oil and natural gas activity accounts for more than 50% of employment and 60% of total wages.[5] The average exploration and production wage is $84,795, eleven times higher than the average recreation-related salary of $7,411.
- Industry jobs are critical to Utah's economy. The unemployment rate in the Uinta Basin is 2.2%, versus 3.7% overall in Utah and 7.2% in the United States.[6] Policies or actions that prevent access to public lands for oil and natural gas development negatively impact Utah jobs.

Conclusion: The Department of Interior should not restart the planning process for the recently completed Utah RMPs, but instead supplement them on specifically identified issues. For example, if the Department of Interior determines that it cannot maintain the recently revised RMPs without conducting quantitative ozone modeling, then the RMPs could be supplemented using the scientific results from the soon-to-be released UBAQS.

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[1] *The American Recovery and Reinvestment Act of 2009: Creating Jobs, Investing in Our Country's Future, and Cutting Taxes for the People of Utah*, Democratic Policy Committee, Senator Byron L. Dorgan, Chairman; February 19, 2009, http://dpc.senate.gov/docs/fs-111-1-24-states/ut.pdf.

[2] *The Structure and Economic Impact of Utah's Oil and Gas Industry Phase I – The Uinta Basin,* Bureau of Economic and Business Research (BEBR), University of Utah, November 2007; *The Structure and Economic Impact of Utah's Oil and Gas Industry Phase II – Carbon and Emery Counties,* BEBR,U. of Utah, December 2007; *The Structure and Economic Impact of Utah's Oil and Gas Industry Phase III – Grand County,* BEBR, U. of Utah, January 2008.

[3] *Colorado 49th in stimulus aid, tax relief,* Rocky Mountain News, February 23, 2009, http://www.rockymountainnews.com/data/stimulus/.

[4] *2008 Economic Report to the Governor: State of Utah,* Governor's Office of Planning and Budget, January 2008, http://www.governor.utah.gov/dea/ERG/ERG2008/2008ERG.pdf.

[5] *The Structure and Economic Impact of Utah's Oil and Gas Industry Phase I – The Uinta Basin,* Bureau of Economic and Business Research, University of Utah, November 2007.

[6] Bureau of Labor Statistics, January 2009 figures.

Categorical Exclusions

- *Categorical exclusions (CX) were mandated by Congress in the Energy Policy Act of 2005. Despite that Congressional mandate, BLM has often been reluctant to use them, and consequently, the full benefit of the law has not been achieved.*

- *EPAct 2005 mandated five situations in which CXs can be used. The limited circumstances where Section 390 CXs can be used were designed to enable energy development where the impact is small, in developed fields, and where drilling was analyzed in a NEPA document as a reasonably foreseeable activity.*

- *The law was designed to limit redundant environmental analysis and environmental impact by enabling drilling on existing well sites. Despite this reasonable, balanced approach to developing vital energy resources while still protecting the environment, CXs are under attack. There are no situations where wells are drilled without environmental analysis. CXs merely remove a layer of redundant analysis.*

- *Given the long lead time for Environmental Assessments (EA) and Environmental Impact Statements (EIS), CXs are an important means to ensure that operators can continue drilling for vital American energy resources. In some areas, companies would not be able to continue their drilling program without CXs.*

- *Legislation to remove categorical exclusions would remove a tool that ensures a constant supply of American natural gas and oil at an affordable price.*

Energy Policy Act of 2005: SEC. 390

(a) NEPA REVIEW: Action by the Secretary of the Interior in managing the public lands, or the Secretary of Agriculture in managing National Forest System Lands, with respect to any of the activities described in subsection (b) shall be subject to a rebuttable presumption that the use of a categorical exclusion under the National Environmental Policy Act of 1969 (NEPA) would apply if the activity is conducted pursuant to the Mineral Leasing Act for the purpose of exploration or development of oil or gas.

(b) ACTIVITIES DESCRIBED.—The activities referred to in subsection (a) are the following:

(1) Individual surface disturbances of less than 5 acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to NEPA has been previously completed.

(2) Drilling an oil or gas well at a location or well pad site at which drilling has occurred previously within 5 years prior to the date of spudding the well.

(3) Drilling an oil or gas well within a developed field for which an approved land use plan or any environmental document prepared pursuant to NEPA analyzed such drilling as a reasonably foreseeable activity, so long as such plan or document was approved within 5 years prior to the date of spudding the well.

(4) Placement of a pipeline in an approved right-of-way corridor, so long as the corridor was approved within 5 years prior to the date of placement of the pipeline.

(5) Maintenance of a minor activity, other than any construction or major renovation or a building or facility.

Proposed Tax Increases

"We don't believe it makes sense to significantly subsidize the production and use of sources of energy (like oil and gas) that are dramatically going to add to our climate change (problem)."

U.S. Secretary of the Treasury Timothy Geithner
Statement to the Senate Finance Committee
March 4, 2009

- *The natural gas and oil industry is able to deduct the cost of its business, which is in line with every other manufacturing industry in America. These are not subsidies or loopholes as the administration suggests, and to categorize them as such is dishonest.*

- *Policies that increase taxes on the domestic natural gas and oil industry are counter to the goals of the Obama Administration and Congress to reduce U.S. dependence on foreign sources of energy, tackle climate change, and enable renewables.*

- *Taking steps to develop renewable energy sources should not be done by making the production of traditional sources of energy more difficult and America less energy independent.*

- *In these uncertain economic times, policies that increase taxes on domestic natural gas and oil producers will divert investment capital overseas, compromise American jobs, decrease energy security, and lead to higher energy prices for consumers.*

- *Independent producers typically reinvest over 100% of their cash flow back into American projects. Consequently, polices that increase taxes take capital away that could otherwise be invested in projects to stimulate the economy, create American jobs, and produce American energy.*

- *Congress has provided tax incentives over the years to stimulate domestic natural gas and oil production financed by private sources. The exploration for natural gas and oil has a very high degree of risk and U.S. income tax policy has evolved over the last two decades to align with this economic risk.*

- *Increasing taxes on industry will result in a sector-wide downgrade of the credit ratings of independent E&P companies, pushing some companies into insolvency.*

- *Increased taxes will render many domestic natural gas drilling projects in the U.S. uneconomic at today's forward prices. As a result, production will plummet and prices will spike, since about half the current U.S. gas supply comes from wells drilled in the last three to four years. This will force more LNG imports, further outsourcing jobs and widening the balance of payments.*

- *Tax increases will have the perverse effect of giving coal an economic advantage over natural gas, which emits just over half the greenhouse gases of coal.*

- *It is unwise to promote tax policies that will result in less energy supply, higher energy costs, massive domestic job losses, bankruptcy of more U.S. companies and increased dependence on foreign energy sources.*

- *The fundamentals of global energy have not changed even though prices have declined in the last year. Global oil production cannot keep up with global oil demand. A co-ordinated energy policy that includes domestic natural gas as part of the solution is a must.*

Details

Below are specific tax provisions being proposed for repeal :

- Intangible drilling costs (IDC) are all costs incident to drilling a well, from geological surveys to drilling contractors, and are typically 65 – 80% of the cost of a well. Without it, the domestic natural gas industry would have 30% to 50% less cash flow available for investment in drilling domestic natural gas and oil wells. Over the past several years, natural gas producers have spent billions on a massive R&D effort aimed at advanced drilling and completion technologies. Losing the tax deduction for these costs would lengthen the payback period and diminish the returns on invested capital. Spreading these costs over the life of the well could cut the return by a third, effectively eliminating the incentive to continue the R&D activities. Repealing the ability to expense these costs will result in fewer wells drilled and decreased domestic production.

- Section 199 deduction was initiated by the JOBS Act of 2004 to make additional capital available to American production and American jobs. Consequently, removing this deduction would discourage investment and make U.S. projects less competitive with foreign ones.

- Percentage depletion was specifically intended to encourage the participation of small natural gas and oil producers. The deduction is not available to large companies and by allowing for the recovery of capital investment over time, is essential for meeting the costs of operating marginal wells.

- A repeal of the working interest exception would remove the individual investor from the natural gas and oil industry. Small working interest owners pay their proportionate share of costs for the operation of well or wells. They are taking on risk that is disproportionate to other "passive" investors. Many of these small business owners have been part of some of the largest discoveries of hydrocarbons in the United States.

- The marginal well tax credit available for 650,000 marginal or 'stripper' wells in the U.S. (defined as a well producing fewer than 15 barrels or 90 mcf per day) enables a sizeable portion of America's domestic energy supply. Removing the credit would make most marginal wells uneconomic, thereby removing 25% of America's crude oil (roughly equivalent to our imports from Saudi Arabia) and 10% of natural gas supply.

Punitive Taxes – A History

- In April 1980, the federal government enacted a crude oil windfall profits tax (WPT) on the domestic oil industry. The WPT was actually an excise tax imposed on the difference between the market price of oil and an adjusted base price. The WPT resulted in: $80 billion in gross revenues, significantly less than the $393 billion projected; reduced domestic oil production of about 8.0%; and increased dependence on foreign oil as imports grew 13%.

- The WPT was repealed in 1988 because it was an administrative burden on the IRS; generated little or no revenues by 1987; reduced oil and gas jobs by about one-third; and increased the United States' dependence on foreign oil.

Hydraulic Fracturing

"Hydraulic fracturing…is a valuable tool in reducing our dependence on foreign energy supplies."

Sen. Jeff Bingaman (D-NM)
Chairman, Senate Energy Committee
March 7, 2002

Background

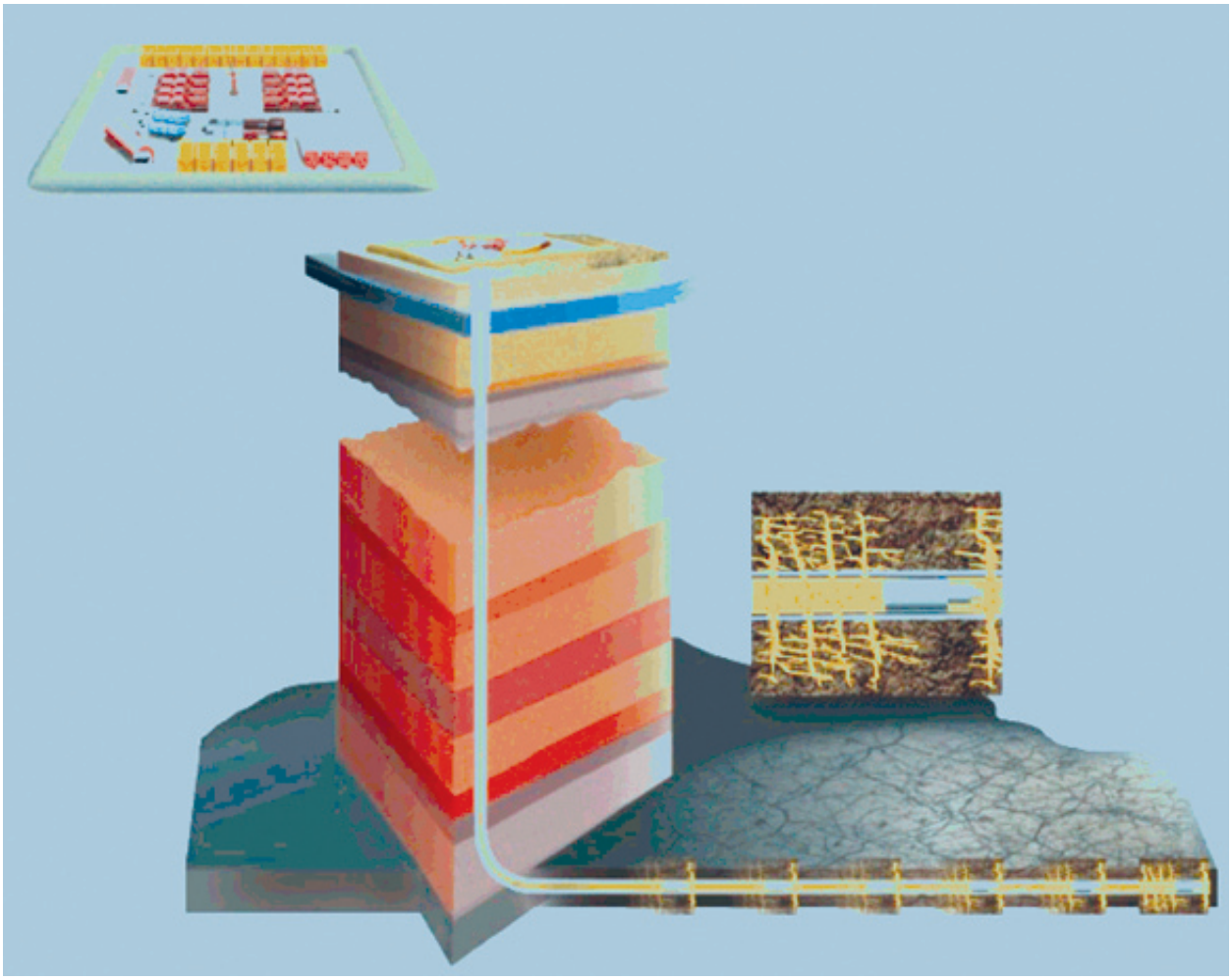
- *Hydraulic fracturing is a practice used to stimulate production from natural gas and oil reservoirs. Fracing in shales and tight sands is leading to increased natural gas and oil reserves, as advances in the technology are enabling energy companies to develop reserves not previously possible to exploit.*
- *In 2007, a record high 46.1 Tcf was added to natural gas proved reserves, a 13% increase from the previous year, according to the Energy Information Agency. For the first time in years, the US reported proved reserve additions of oil greater than domestic production, at 2 billion barrels. These increases in reserves would not be possible without hydraulic fracturing.*
- *Fracing has enabled the United States to increase its reserves to such an extent that we now have the 6th largest reserves in the world, up from 14th place a decade ago.*
- *At a time when our nation needs more domestic energy to insure greater energy security, fracing is a vital technology for meeting that demand.*

Details

- Hydraulic fracturing is a safe, well-tested technology that has been used to develop energy for over 60 years. It is performed thousands of times each year with an exemplary safety record. ***There are no documented cases of contamination to drinking water from fracing.***
- Hydraulic fracturing happens during the completion process, after a well has been drilled. High pressure fluid, mostly water, is pumped down the wellbore and into the gas or oil-bearing rock to break or frac the formation so that the gas or oil can flow from tight (low permeability) reservoirs back into the well and to the surface. Sand or ceramic grains are mixed with the fluid that's pumped down the well to prop the fractures open. Remember, industry is pumping these fluids down steel casing that is cemented in place and carefully designed to protect fresh water aquifers and ***into rocks that contain oil and natural gas!***
- Like all procedures surrounding the development of energy, hydraulic fracturing is already regulated by hundreds of local, state, and federal laws. In spite of the alarmist claims by some in Congress and their allies in the extremist environmental community, there is absolutely no evidence that additional regulations are needed.

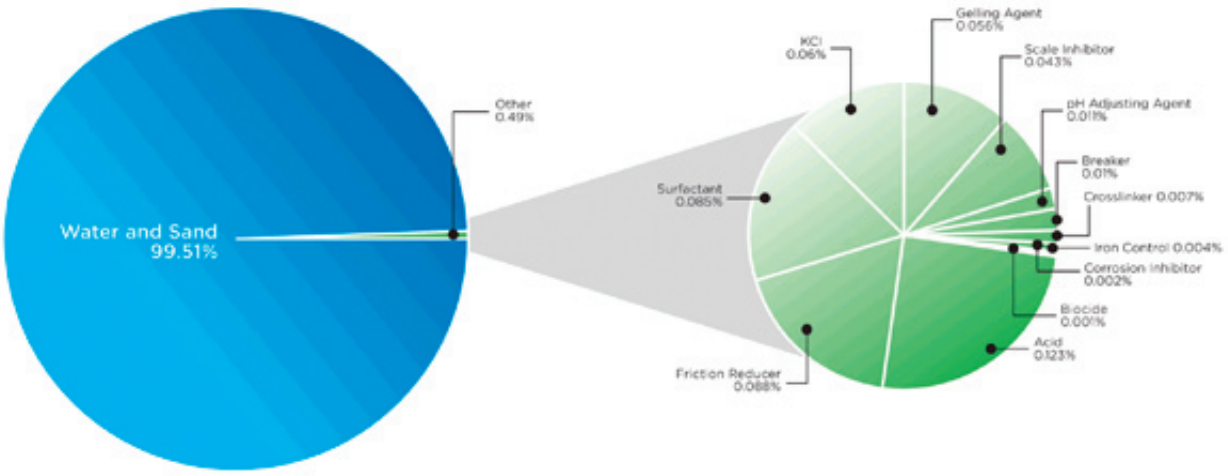
- Because the states already regulate the practice of hydraulic fracturing, federal regulation is unnecessary. The Safe Drinking Water Act exemption for hydraulic fracturing does not eliminate the EPA's ability to become involved if necessary. If the practice is subject to another layer of regulation it will delay natural gas supplies from reaching consumers.
- The Wyoming, North Dakota, and Utah legislatures recently passed resolutions that Congress not remove the fracing exemption, thereby enabling the states to retain regulatory primacy. The Alabama, Oklahoma, and Texas legislatures have introduced similar resolutions.
- The Interstate Oil and Gas Commission, representing all natural gas and oil producing states, recently issued a resolution that Congress not repeal the exemption. IOGCC completed a survey of all producing states in 2002 and found no cases of contamination from fracing.
- EPA has found no evidence that water quality degradation has resulted from fracing.[1]
- Senator Jeff Bingaman (D-NM), Chairman of the Senate Energy and Natural Resources Committee, has recognized the safety of fracing. As he stated in 2002, "hydraulic fracturing … is a valuable tool in reducing our dependence on foreign energy supplies." He further noted that "During both the … Clinton administration, and the current administration, the EPA has maintained that Federal regulation of hydraulic fracturing is not required."[2]
- In a May 5, 1995 letter, then EPA Administrator Carol Browner stated "There is no evidence that the hydraulic fracturing at issue has resulted in any contamination or endangerment of underground sources of drinking water (USDW). Repeated testing, conducted between May 1989 and March 1993 … failed to show any chemicals that would indicate the presence of fracturing fluids."[3]
- Despite the lack of evidence that fracing harms drinking water, environmental groups, led by the Natural Resources Defense Council, have been pushing to repeal the fracing exemption from the Underground Injection Control program of the Safe Drinking Water Act. Representatives DeGette, Hinchey and Salazar have complied with H.R. 7231 which would repeal the exemption.
- Hydraulic fracing fluids typically consist of 99.5% water and sand. The remaining 0.5% contains three primary additives: 1) a friction reducer, similar to Canola oil, to thicken the liquid; 2) a bactericide like Chlorine used in swimming pools; and 3) a micro emulsion element similar to those found in personal care products.
- Over 95% of IPAMS member production comes from wells that must be fraced. Without this time tested procedure, many wells simply would not be able to produce vital energy resources that enable the United States to achieve greater energy security.

[1] *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs*, Final Report, US Environmental Protection Agency, June 2004, page ES-13.
[2] *Congressional Record – Senate*, March 7, 2002, page S1633.
[3] Letter dated May 5, 1995, from Carol Browner, EPA Administrator, to David Ludder, general counsel for the Legal Environmental Assistance Foundation, denying a petition for EPA to regulate hydraulic fracturing based on a case in Alabama. The EPA determined state law is appropriate for regulating hydraulic fracturing and there is no need to supplant these efforts.



Not to scale. The space indicated in the break between layer is usually 4,000 to 12,000 feet. If this graphic was shown with a vertical scale of 500 feet per inch (assuming a 12,000-foot-deep wellbore), this drawing would be 2 feet long!

Source: Chesapeake Energy, Hydraulic Fracturing Fact Sheet, February 2009.



Example of a Shale Frac Fluid Makeup

A representation showing the volumetric disposition of deep shale gas hydraulic fracture components reveals that 99.5% of fracturing fluids are comprised of freshwater and sand. These compounds are injected into deep shale gas formations and are typically confined by many thousands of feet of rock layers.

FRACTURING FLUID ADDITIVES, MAIN COMPOUNDS AND COMMON USES			
Additive Type	**Main Compound**	**Purpose**	**Common Use of Main Compound**
Acid	Hydrochloric acid or muriatic acid	Helps dissolve minerals and initiate cracks in the rock	Swimming pool chemical and cleaner
Biocide	Glutaraldehyde	Eliminates bacteria in the water that produce corrosive by-products	Disinfectant; Sterilizer for medical and dental equipment
Breaker	Sodium chloride	Allows a delayed break down of the gel polymer chains	Table salt
Corrosion inhibitor	n,n-dimethyl formamide	Prevents the corrosion of the pipe	Used in pharmaceuticals, acrylic fibers and plastics
Crosslinker	Borate salts	Maintains fluid viscosity as temperature increases	Used in laundry detergents, hand soaps and cosmetics
Friction reducer	Petroleum distillate	"Slicks" the water to minimize friction	Used in cosmetics including hair, make-up, nail and skin products
Gel	Guar gum or hydroxyethyl cellulose	Thickens the water in order to suspend the sand	Thickener used in cosmetics, baked goods, ice cream, toothpaste, sauces, and salad dressings
Iron control	Citric acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice ~7% citric acid
KCl	Potassium chloride	Creates a brine carrier fluid	Used in low-sodium table salt substitute, medicines and IV fluids
Oxygen scavenger	Ammonium bisulfite	Removes oxygen from the water to protect the pipe from corrosion	Used in cosmetics, food and beverage processing and water treatment
pH adjusting agent	Sodium or potassium carbonate	Maintains the effectiveness of other components, such as crosslinkers	Used in laundry detergents, soap, water softener and dish washers
Proppant	Silica, quartz sand	Allows the fractures to remain open so the gas can escape	Drinking water filtration, play sand, concrete and brick mortar
Scale inhibitor	Ethylene glycol	Prevents scale deposits in the pipe	Used in household cleansers, de-icer, paints and caulk
Surfactant	Isopropanol	Used to increase the viscosity of the fracture fluid	Used in glass cleaner, multi-surface cleansers, antiperspirant, deodorants and hair color

Source: Chesapeake Energy, Hydraulic Fracturing Fact Sheet, February 2009.

Regulation

- *Congress is considering substantial increases in regulation on the natural gas and oil E&P industry. The environmental lobby has been pushing for more regulation under the Safe Drinking Water Act (SDWA), Emergency Planning and Community Right-to-Know Act (EPCRA), Resource Conservation and Recovery Act (RCRA), and other laws.*
- *Industry has not received unfair exemptions from these laws. Congress determined these laws not to be applicable to the natural gas and oil industry because the nature of E&P facilities are very different from the large manufacturing facilities that these laws were designed to regulate.*
- *Natural gas and oil facilities are generally located in rural areas, far away from the large urban populations these laws were meant to protect. More important, industry does not utilize large quantities of toxic materials like the large chemical manufacturing facilities that are the intended targets of the laws.*
- *The Department of Energy recently released a study showing the impacts from additional regulation.*
  - *$10 billion annual cost to industry to comply with the regulations*
  - *Shut in oil production of 183,000 barrels per day and 245 Bcf annually*
  - *57% of producing onshore oil wells and 35% of natural gas wells shut in*
  - *42 to 53 Tcf of otherwise economic natural gas production shut in, a 12% to 18% reduction*
  - *Prevent 33,000 to 76,000 unconventional wells from being drilled and forego 50 to 90 Tcf of reserve additions.*

Points on Each Law

- TheUnderground Injection Control (UIC) program of the **SDWA** was meant to regulate large quantities of toxins being injected for the purpose of waste disposal. Congress did not intend to regulate hydraulic fracturing, in which fluids are not injected for storage and most of the fluids are recovered. (See the Hydraulic Fracturing chapter of this briefing book for more information.)
- The Toxic Release Inventory (TRI) reporting under the **EPCRA** was meant to apply to manufacturing facilities processing more than 25,000 pounds of any covered toxic chemical. Congress chose not to impose TRI requirements on many types of facilities, including natural gas and oil E&P sites. EPA specifically declined to apply the rules to E&P because well sites do not exceed the thresholds for numbers of employees and amounts of chemicals used. E&P companies do comply with EPCRA requirements that Material Safety Data Sheets (MSDS) be present at any size facilities where chemicals are kept in any quantity.
- **TRI reporting** requirements currently apply to about 30,000 facilities generating about 77,000 reports. There are 933,000 operating wells across the country. Subjecting even a portion of these facilities to TRI requirements would overwhelm the system with reports about facilities that pose little risk, and divert regulator attention away from facilities that pose real threats.
- **RCRA** concerns the handling, tracking and disposal of hazardous waste from cradle to grave. Congress did not intend RCRA to apply to the high-volume, low-toxicity wastes in drilling fluids, produced waters, fracing fluids and other E&P wastes. EPA studied the mater and confirmed that E&P should not be regulated under RCRA because state regulatory programs were more effective at handling the wide variety of geological, ecological, topographic, economic, and geographic differences among well sites.

[1] *Potential Economic and Energy Supply Impacts of Proposals to Modify Federal Environmental Laws Applicable to the U.S. Oil and Gas Exploration and Production Industry, DOE,*

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