National Commission on the
BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

I hereby certify that these minutes constitute an accurate record of the Third Meeting of the *National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling* held on September 27-28 in Washington, DC.

Senator Bob Graham
Co-Chair

Date

William K. Reilly
Co-Chair

Nov 9, 2010
Date

An Advisory Committee to the President of the United States

National Commission on the
BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING

3rd Meeting

September 27-28, 2010
Washington, D.C.

Meeting Minutes

An Advisory Committee to the President of the United States

Minutes of the 3rd Meeting
Washington, D.C.
September 27-28, 2010

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Call to Order and Opening Remarks

9:00 AM

All Commission Members and Designated Federal Officer Present:

Elena Melchert, Designated Federal Officer (DFO)

Senator Bob Graham, Co-Chair

The Honorable William Reilly, Co-Chair

Frances Beinecke

Donald Boesch

Terry Garcia

Cherry Murray

Frances Ulmer

Opening Remarks

Elena Melchert: She said that she was appointed by Chris Smith, the Commission DFO, to serve as the DFO for the first day's proceedings. She introduced the commissioners and reviewed the meeting agenda before handing the meeting over to the co-chairs. *The Executive Order establishing the Commission can be found in the Pre-Meeting Materials section of the Attachments, and the Agenda for the meeting is included as Attachment #1*.

Senator Bob Graham: He called this the end of the beginning phase of the commission and said that there will be a briefing in the near future that will encompass everything the commission has done to this point. He then turned control over to the Honorable William Reilly. *Senator Graham's oral opening remarks can be found in Attachment #3*.

The Honorable William Reilly: He said that previous testimony has suggested a need for change and adjustment in the drilling culture and regulations. He said that although the response demonstrated the dedication and ingenuity of involved parties, it would be difficult to make the case that we were well-prepared overall and wondered how the response would work if a similar disaster occurred in the Arctic. New policy going forward will need to create a culture to eliminate complacency in government and industry. *The Honorable Mr. Reilly's oral opening remarks can be found in Attachment #4*.

Senator Bob Graham: He introduced Admiral Thad Allen and said that Fran Ulmer would be the lead questioner for this panel.

The oral opening remarks for the first day can be found on pages 6 through 17 of the transcript (Attachment #2).

Panel I (a): Decision-Making Within the Unified Command

9:10 AM

Panelist: Admiral (ret.) Thad Allen, National Incident Commander for the Unified Command

Prepared Remarks

Admiral (ret.) Thad Allen: He stated that research and development for oil spill response has had very little funding over the last 20 years, limiting any advancement. Information on the response has been collected weekly by staff and compiled. Currently they have completed version 4.0 of this data; version 5.0 will be approximately 500 pages and can be made available to the commission upon completion. He wanted to focus on needs at regional and local levels and to avoid adding layers of bureaucracy to the response effort; coordination was required across state and regional boundaries to deal with situations not addressed in the Oil Spill Act (OSA) of 1990. Greater clarity is needed regarding the relationship between the responsible party and the unified command in the future, especially to avoid confusion with the public. The OSA of 1990 says that the responsible party is to resource the response, while the Federal Government is to oversee the response. He said that the research and development for response must be addressed and results proven before another incident occurs.

The oral remarks of this panel can be found on pages 18 through 28 of the transcript (Attachment #2).

Commission Question and Answer

The Commissioners asked about the ability of the U.S. Coast Guard (USCG) to respond with limited resources and the relationship between the responsible party, the local, state, and federal authorities, and the USCG. They also asked about the adequacy of the response plans and any improvements that could be made. They inquired how the low-flow rate estimates impacted the response and if anything would have been done differently if the estimates were higher. The panelist said that there could always be more people or resources, but that it is a value proposition, and the amount has to be rationalized. The partnerships must be optimized – federal authority cannot be delegated to local officials or agencies. He stated that future response plans need to include interaction with local (e.g., parish presidents) officials, how to include local areas or regions in the contingency plans, and how to designate nationally sensitive areas such as marshes and fishing areas. He said that the worst case scenario was assumed from the beginning, and they always planned for a catastrophic event.

As with the adequacy of the response plans, the Commissioners also wondered about the adequacy of available resources and expertise, and any complications impacting response and cleanup. They asked about a quote saying that the response was successful wholesale, but not successful retail. The panelist said that the issue was the production and movement of resources, not the funding. Data, knowledge management, access to that data, and the analysis of data were not addressed by the Oil Spill Act of 1990. Some of the people that learned the most from past spills were not able to contribute to this spill. He said that some areas did not fall under the unified command's authorized ability to respond and that any delay could be mostly attributed to the enormity of the response and not due to any slowness on

the part of the responsible party. It was difficult for BP to outsource functions to second and third parties while looking out for business.

The oral question and answer session for this panel can be found on pages 28 through 54 of the transcript (Attachment #2).

Panel I (b): Decision-Making Within the Unified Command

9:45 AM

Panelists: **Captain Edwin Stanton, Sector Commander, New Orleans, U.S. Coast Guard**

Doug Suttles, Chief Operating Officer for Exploration and Production, BP

Richard Harrell, Mississippi Department of Environmental Quality

William "Billy" Nungesser, President of Plaquemines Parish, Louisiana

Prepared Remarks

Captain Edwin Stanton: He discussed his role as local incident commander in Houma, Louisiana. He established several top priorities, such as safety of life and ensuring that ports in Louisiana would not close. He invited everyone to submit plans for response and issues to address, and established liaison officers at the parishes and state level. He called the overall response good, if sometimes ugly.

Doug Suttles: He said that he has prepared a document called "*Deepwater Horizon Containment and Response*" that includes key lessons learned from unified area of command. The unity of effort was key: the implementation of technology played an important role; and information technology proved critical and should be expanded in the future. He stated that new equipment and processes developed during the spill made a significant difference in the response, and any single organization could not have succeeded alone. *Mr. Suttles' statement can be found in Attachment #5*.

Richard Harrell: He listed challenges to the response effort, including frustration with timely plans, duplicate layers of review, rotating contractor staff, and the unified command vs. decision makers on the ground. Once BP placed a high-level individual in Mississippi, the flow of information improved dramatically, and was followed by a similar plan from the unified command shortly thereafter. He said that plans and resources need to be reevaluated, and lessons learned should be incorporated into the future plans to improve the coordination of state assets. There should also be frequent exercises of the response plan as conducted for hurricanes.

William "Billy" Nungesser: He said that plans need to be in place – not for cleaning up the marshes, but to prevent marshes from being oiled in the first place. Much oil is still being cleaned up, but many people do not know what is still going on. He cannot tell you who is in charge, and local leaders should have a seat at the table. The successes are being discussed, but the ongoing issues are not being brought up. *Mr. Nungesser's statement can be found in Attachment #6*.

The oral remarks of this panel can be found on pages 54 through 75 of the transcript (Attachment #2).

Commission Question and Answer

The Commissioners asked the panelists how more people could get involved in preparation and planning in the future and about the differences in operations between the Gulf of Mexico and Alaska. They also asked how funding can be acquired for research and development in spill response and cleanup technologies. They asked why the responsible party did not invest in spill response technology over the past two decades; how the public perceived BP's involvement in the response; and how the national incident command worked; and how it could be improved in the future. The panelists replied that more early local involvement would have made a difference. Programs such as the Vessels of Opportunity were essential and should be included in future planning. Industry and government need to work together to ensure that research and development happens. It is difficult to understand the lack of investment over the last twenty years and that must change going forward. They saw concern, frustration, and a sense of doubt from the public about BP being involved for the right reasons; however, no single entity could have directed the response alone, and the U.S. Coast Guard was always in charge. They never got a real idea of who was in charge or who could provide answers. Also many people who were available to help were not allowed to because of hazard laws.

The Commissioners asked how the responsible party should be involved in the future, and how they should interact with the locals and agencies to be effective. They also asked this panel about the effect of the flow rate estimates on the response. They inquired as to disagreements between the federal responders and the state, especially with regards to plans, or lack thereof, to keep oil out of the marshes. They wondered about how money could be invested to improve the response and about the equipment and regulatory structure of Norway. They also asked about BP's permit plan and the response plan included in the permit and whether response plans in permitting in the future will address various possibilities, not just a single protocol. The local agencies and organizations were able to use compensation provided by BP in this incident for response efforts that would not have been possible in the past. The panelists discussed a proposed berm project in Plaquemines Parish. They said that even the low -flow rate estimates would be considered a medium spill every single day, and they are always taught to bring every available resource to the table. The inclusion and participation of local agencies and plans were discussed, as well as the relationship between the state and federal authorities. The panelists agreed that the complexity of this spill led to some difficulties and that best practices around the world should be examined for their application in the U.S. Lessons learned from this response will be applied in future planning and permitting.

The oral question and answer session for this panel can be found on pages 75 through 130 of the transcript (Attachment #2).

Panel II: The Amount and Fate of the Oil

11:15 AM

Panelists: **Dr. Bill Lehr, Senior Scientist, Office of Response and Restoration, National Oceanic and Atmospheric Administration (NOAA)**

Mark K. Sogge, Chief of Staff, U.S. Geological Survey (USGS), Western Region, Director's Office

Dr. Ian MacDonald, Professor of Oceanography, Department of Earth, Ocean and Atmospheric Science, Florida State University

Dr. Richard Camilli, Assistant Scientist, Department of Applied Ocean Physics and Engineering, Woods Hole Oceanographic Institution

Dr. Terry Hazen, Senior Scientist, Head of the Ecology Department and DOE Distinguished Scientist, Earth Sciences Division, Lawrence Berkeley National Laboratory

Prepared Remarks

Dr. Bill Lehr: He discussed the strategy, particle image velocity that was used to estimate the flow rate of the leak from plume size and video. The event was an emergency, not an experiment, and the method parameters were determined by the needs. He said that the actual report will be coming out shortly, and it will include the numbers and recommendations to improve the calculations.

Mark K. Sogge: He said that he attended to answer questions about the general flow rate technical group activities.

Dr. Ian MacDonald: He provided a presentation and discussed his estimation of flow rates, which were much higher than initial BP estimates. He addressed the belief that natural seeps in the Gulf mean that the Gulf is predisposed to dealing with oil, but oil leak from the *Deepwater Horizon* was much more concentrated. He stated that remote sensing technologies used to evaluate oil spills have improved greatly since the Exxon Valdez spill in 1989. *Dr. MacDonald's statement and presentation can be found in Attachment #7*.

Dr. Richard Camilli: He provided a presentation and discussed the estimation of leak flow rates of the Lawrence Berkeley National Laboratory Macondo Oil Leak Research team. He also discussed methods of estimation, data collection, and analysis. *Dr. Camilli's statement and presentation can be found in Attachment #8*.

Dr. Terry Hazen: He provided a presentation and discussed biological representation in the Gulf, as well as an article published in *Science* and peer reviewed. *Dr. Hazen's statement and presentation can be found in Attachment #9*.

The oral remarks of this panel can be found on pages 131 through 151 of the transcript (Attachment #2).

Commission Question and Answer

The Commissioners asked about the flow-rate estimates, why they differed, how the estimates were calculated, and the inclusion of independent scientists. Other questions focused on the long-term

impact of the oil, difficulty in obtaining samples, funding, takeaway lessons learned, and the advancement of flow-rate estimation.

The panelists said that multiple estimates allowed a ballpark check, and that different estimates were subject to judgment, subjectivity, and fatigue, and more sophisticated measures were necessary. The long-term impacts of the spill are not well known; baselines for much of the ecosystem do not exist; and just getting baseline calculations will be a long-term process. The standards that BP was using for samples created difficulties for outside researchers to obtain samples. Technologies have improved, but not in a purpose-driven way, and more comprehensive, team science is needed. Scientists need to be available to respond immediately and gather critical data, a kind of science strike team to respond similar to the response of the USCG. The technology for predicting this kind of spill, multiphase flows in subsurface environments, has not followed the advancing technology for drilling at deeper depths.

The oral question and answer session for this panel can be found on pages 151 through 195 of the transcript (Attachment #2).

Panel III (a): The Use of Dispersants

1:30 PM

Panelist: The Honorable Lisa Jackson, Environmental Protection Agency (EPA) Administrator

Prepared Remarks

The Honorable Lisa Jackson: She discussed the use of dispersants to break down the oil, both on the surface and below the surface. She said that water monitoring has continued to show no dispersants near the shore. Money was recently appropriated to investigate dispersants, and EPA conditionally granted permission for subsurface use but reserved the right to halt their use. She said that preventing oil from reaching the shoreline was the top goal of the response team.

The oral remarks for this panel can be found on pages 196 through 203 of the transcript (Attachment #2).

Commission Question and Answer

Questions from the Commission for this panelist included the disposal of debris, guidelines for dispersant use, toxicity testing, air quality monitoring, and confidence in the government's response to the spill. The panelist said that the EPA oversaw the states' oversight of waste disposal and worked to make sure it was fair and balanced and that no hazardous materials were included. Guidelines for dispersant use are needed, especially novel uses that occurred during this incident, and all mechanical means of capture or dispersal were to be used before using any dispersants. She stated that dispersant use was a risk-management decision and more long-term toxicity studies need to be performed. The Gulf States need to become more involved to get ahead of the curve with scientific work in the Gulf rather than trying to catch up in the future. Air quality monitoring data was among the first publicly available because it was already being collected and showed no increased levels of pollution. She stated

that developing the confidence of the public is continuous and ongoing and increased testing of dispersants needs to occur.

The oral question and answer session for this panel can be found on pages 203 through 234 of the transcript (Attachment #2).

Panel III (b): The Use of Dispersants

2:00 PM

Panelists: **Rear Admiral Mary Landry, Commander, Eighth Coast Guard District, USCG**

Dr. Nancy Kinner, University of New Hampshire Co-Director, Coastal Response Research Center

Prepared Remarks

Rear Admiral Mary Landry: She summarized her background and responsibilities during the response. She discussed the worst case scenario and that preapproval for dispersant use was authorized, but the subsurface use of dispersants would have been beyond any forecast scenario. *Rear Admiral Landry's submitted document can be found in Attachment #10*.

Dr. Nancy Kinner: She said that previous dispersant research has focused on effects and response, not long-term effects. Mechanical and chemical response actions are complementary, with mechanical responses being preferred but not always useful. She said that there is a pressing need for peer reviewed research and development to study dispersants and dispersed oil, and their effects on organisms and ecosystems under realistic scenarios.

The oral remarks of this panel can be found on pages 234 through 245 of the transcript (Attachment #2).

Commission Question and Answer

The Commissioners asked how the USCG evaluated plans for dispersant use and if it would be possible to use dispersants in near shore environments. They requested that the panelists reply to additional comments at a future time due to time constraints. The panelists said that BP was monitored very closely early in the response to ensure that rules for dispersant application were being followed; the volume and use of dispersants was evaluated constantly based on the current state of the response operation. A new set of protocols must be developed to evaluate the risks associated with dispersants, including risks to organisms throughout relevant life stages, as well as acute and chronic toxicity.

The oral question and answer session for this panel can be found on pages 245 through 253 of the transcript (Attachment #2).

Panel IV: The Future of Offshore Drilling

2:35 PM

Panelists: **The Honorable Ken Salazar, Secretary of the Interior**

The Honorable David J. Hayes, Deputy Secretary of the Interior

Michael R. Bromwich, Director, Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEM)

Prepared Remarks

The Honorable Ken Salazar: He said that the overall goal is to move forward with oil and gas exploration and production in the oceans of America, while protecting the safety of workers and the environment. He said that a new framework was instituted on March 31, 2010, for oil and gas development on the continental shelf, and it was decided to advance development into the western Gulf of Mexico and outside of 100 miles off the coast in the eastern Gulf. He said that more information is needed to make a decision on oil and gas development on the Atlantic coast, and that there will be a strong effort for renewable energy off the Atlantic coast. *The Honorable Mr. Salazar's statement can be found in Attachment #11*.

Michael Bromwich: He said that the BOEM would be gathering information by soliciting contributions from experts in industry, environmentalists, and other areas in three main areas: drilling and workplace safety, spill containment, and spill response. During a tour of the country, he had given nearly 100 presentations; they have been gathering, analyzing, and synthesizing data, and will have a report by the end of September.

The Honorable David Hayes: He said that one-third of the BOEM budget had been spent in support of NOAA and the USGS and that the remainder had been spent for independent scientific grants. There have been various players involved with the science questions before the department.

The oral remarks of this panel can be found on pages 253 through 264 of the transcript (Attachment #2).

Commission Question and Answer

The Commissioners asked how the state of BOEM had affected drilling proposals and permits, if there were any suspensions or dismissals that stemmed from oversight board inquiries, and if they had taken into account the experience of other countries. The panelists said that the agency needs to be adequately funded and supported and that much of the poor conduct took place before the current administration. There have been employee terminations and prosecutions, and the reorganization is addressing various functions. The BOEM has been under financed, under resourced, and under trained and has been susceptible to industry pressure.

The Commissioners wondered about the persistence of oil and the effects on the ecosystem in Alaska from the Exxon Valdez spill and about the usefulness of spill technology in the Arctic region. The panelists stated that other agencies have expertise and discussed possible consulting relationships with these agencies, and discussed the difficulties involved in Arctic drilling and spill response. They were also asked about how quickly drilling could resume after the moratorium was lifted and how proposals will be better reviewed considering the under resourcing and under staffing. The panelists told the Commission about an expected delay in the resumption of drilling in the Gulf and the relocation of the

Mineral Management Service/ Bureau of Ocean Energy Management, Regulation, and Enforcement (MMS/BOEM) staff from California and Alaska to the Gulf of Mexico.

The Commissioners also asked about how to make future spill response plans more effective, how to include long-term scientific research and technologies, if leaseholders had withheld access to information in the past, and asked for recommendations on reorganization and possible regulatory processes. The panelists responded by describing how past response plans did not take into account containment or a spill of this type and that the worst case scenario will have to be accounted for in the future. They discussed monitoring programs along with possible protocols, as well as supplemental Environmental Impacts Statements going forward before the next lease. The panelists stated that regulation is a very important issue and that recommendations should be available for review in the weeks ahead. They said that the reorganization will be a dynamic situation and that the Commission will be kept up-to-date. Finally, the Commission asked for information on the 50 recommendations made by the oversight board.

The oral question and answer session for this panel can be found on pages 264 through 315 of the transcript (Attachment #2).

Panel V (a): Response in the Arctic

3:35 PM

Panelist: The Honorable Mark Begich, U.S. Senator, Alaska

Prepared Remarks

The Honorable Mark Begich: He recommended no cap on company liability for deepwater drilling in the future; resources in the Arctic can help with oil and gas developments, but they must be developed responsibly. He said that the decisions made by the industry now will determine the future of domestic energy, and Alaska has experienced collateral damage because operators and legislators have been waiting to see what would happen in the Gulf of Mexico over the next few months. *The Honorable Mr. Begich's statement can be found in Attachment #12*.

The oral remarks of this panel can be found on pages 316 through 323 of the transcript (Attachment #2).

Commission Question and Answer

The Commissioners asked how a continuation of the moratorium would affect Alaska, how the oil and gas industry could carry out response plans, how regulations should differentiate between regions such as the Gulf of Mexico and Alaska, and how a package of bills for revenue sharing and research would affect proposed development in the Arctic. The panelist said that plans are needed now for next year, and that some delays were unrelated to the moratorium. There are multiple layers of response and protection from the oil and gas industry, and the industry is fully engaged in Alaska – the industry has different relationships with the communities in the Gulf of Mexico and in Alaska. He expects legislative measures to move ahead simultaneously as the areas do not have to be addressed one at a time.

The oral question and answer session for this panel can be found on pages 323 through 338 of the transcript (Attachment #2).

Panel V (b): Response in the Arctic

4:00 PM

Panelists: **Pete Slaiby, Vice President for Exploration & Production, Shell Alaska**

Captain John Caplis, Chief, Office of Incident Management and Preparedness, U.S. Coast Guard

Edward Itta, Mayor of North Slope Borough, Alaska

Dr. Dennis Takahashi-Kelso, Executive Vice President, Ocean Conservancy

Prepared Remarks

Pete Slaiby: He discussed Shell's proposed 2011 program in the Arctic and said that they have a three-tier oil spill response plan that always prepares for low-probability, high-impact scenarios. All of Shell's response assets would be available from the moment the well is begun. The contingency plan has been reviewed by many groups, organizations, and agencies and has been approved. He said that a proposed containment system would be put in place at the well, but that it would be much smaller than the one in the Gulf of Mexico because the worst case scenario spill volume is much less than in the Gulf. *Mr. Slaiby's statement and presentation can be found in Attachment #13*.

Captain John Caplis: He said that a key lesson from this spill is to always be preparing for the worst case scenario and that any spills off the Arctic coast would be even worse due to the extreme conditions. He also listed three keys for lessons learned with respect to actions that can be taken in any future response and that various responses were being tested and evaluated.

Edward Itta: (via teleconference) He told the Commission that the fate of the ocean and the fate of the people cannot be differentiated and that the conditions in the Arctic can only be addressed by a region-specific response plan. He said that everyone needs to slow down, measure the possible impacts, and change the permitting system as it stands. *Mayor Itta's statement can be found in Attachment #14*.

Dr. Dennis Takahashi-Kelso: He reinforced the idea that operations in the Arctic are subject to difficult conditions not present in the Gulf of Mexico. MMS had concluded that a spill was not a reasonably foreseeable event for the 2011 Shell drilling plan and, therefore, did not analyze any spill response. He said that the Arctic outer continental shelf had two fundamental problems: first, there has never been a successful test of spill containment or capture in the Arctic; and second, the body of science is limited or out-of-date and, therefore, not useful. *Dr. Takahasi-Kelso's statement can be found in Attachment #15*.

The oral remarks of this panel can be found on pages 338 through 360 of the transcript (Attachment #2).

Commission Question and Answer

The Commission asked the panelists about spill response ability, how much research has been done in the Arctic, and the interaction between Shell and local communities in Shell's plans for drilling development in the Arctic. The panelists said that the worst case scenario spill discharges would not be as bad as in the Gulf of Mexico and that the response abilities would be sufficient for the worst case scenario. They discussed the differences in the spill responses and abilities between the two regions and that the development process has slowed down to allow for more scientific research. They also wondered how well the response would work, since much response equipment has never been tested in the Arctic. Baseline data for ecosystem functions are not available; and current work is helpful, but has not been tailored to answer fundamental questions.

The Commissioners asked how the Federal Government could play a leading response role in Alaska and how to assure the public that the industry is not taking any unnecessary risks. The panelists discussed tools and performances that have not been put into place. They said that the industry has to ask for a measure of faith from the public. Another panelist said that there is still a problem with actually recovering spilled oil and that there is more to the story than just deploying a response team and equipment. Another problem is the compressed window of response time due to the conditions in the Arctic. The Commissioners asked about the two regions possibly available for drilling in Alaska, about the scenario for Alaska gas and oil development, and about the status of a suspended Shell lease. The panelists said that it would be difficult to measure any impending changes and discussed how long it would take to get an accurate picture of year-round ecosystems and functions.

The oral question and answer session for this panel can be found on pages 360 through 387 of the transcript (Attachment #2).

Public Comment

5:00 PM

1. **Jenny Kordick, Sierra Club:** She said that the Sierra Club brought a group last week to D.C. They spoke with multiple organizations and people, and their message is that the spill is not over. The environmental, economic, and social impacts will be felt for years to come. She said that there must be full accountability from oil industry, long-term funding for science to supplement science, and investment in clean energy.
2. **Michael Gravitz, Environment America:** He asked that the Commission question the true riskiness of offshore deepwater drilling, and said that an event is not nearly as unlikely as has been said. He said that there was an average of five incidents per year from 2006-2010. Each business and individual has their own story. He estimated the value of tourism and fishing to be $39 billion per year in the Gulf Coast region, but BP estimates of the damages have been much lower. He said that it was incumbent on the Commission to tell the president that drilling will never be safe enough. *Mr. Gravitz's statement can be found in Attachment #32*.
3. **Richard Crag, Florida A&M University:** He said that he offered the perspective of historically black colleges and universities and that people of color have been exposed to environmental issues. The most affected communities have been missing from decision -making forums. He

said that a report will be provided to the Commission tomorrow; Senator Graham asked if the report would address the environmental issues' effect on people of color, and Mr. Crag said yes.

4. **Nancy Sopko, Oceana:** She said that it is time to realize that the risks of drilling far outweigh the benefits. The *Deepwater Horizon* disaster was not an isolated incident; there have been at least 21 offshore rig blowouts since 2006. As a response to the spill, President Obama's administration instituted a six-month moratorium, and said that it would not be lifted until certain criteria were met. Ms. Sopko said that no one can prove that the criteria have been met, and that we should start thinking about getting the country off of oil and into a clean energy future. She said that offshore wind power would be the most viable alternative to offshore drilling. Clean energy manufacturing jobs can be created in the Gulf to replace oil jobs.
5. **Michele Roberts, Washington D.C. Office of Advocacy for Human Rights:** She said that her organization is dedicated to upholding human rights and that Congress made it clear that they did not want to uphold the liability cap. She said that it was clear from the Congressional testimony of the survivors that BP meets the cap exception and it is likely that others do as well. She said that the blowout preventer inspection on the *Deepwater Horizon* was years past due. The people of the Gulf Coast deserve a ruling that BP is responsible for the spill. She urged the Commission to call for an issuance of a Federal Administrative Enforcement order. She left her statement for the record. *Ms. Roberts' statement can be found in Attachment #33*.
6. **Micah McCarty, Macaw Tribal Council:** He said that the Tribal Council is proud of its accomplishments, and as a government to government, the Tribal Council understands that there is no better authority to resolve issues. They have put together a program and would like to offer the policy efforts of the Tribal Council. They have become a voting member of the region and are working with the Coast Guard region 13 in the Pacific Northwest to have Vessels of Opportunity ready. He said that the main lesson from the spill is has been a message of "drill drill drill". *Mr. McCarty's statement can be found in Attachment #34*.
7. **Dan Fraser:** He offered that the comparison to work in the nuclear industry is on the right track and that Senator Graham offered to bring science back to the table. He asked how the regulators will keep up with a fast-moving industry and said that probabilistic risk analysis has been part of the nuclear industry for the past 20 years. He said that there is a minimum of a 2-to-1 payback, and it is still paying off 20 years later. He has been working with a team at Argonne National Laboratory for the past few months looking at probabilistic risk analysis to determine if it is feasible and the answer has been a resounding yes.. The risk analysis provides an answer that is verifiable and that the analyses can be compared with events on other rigs. It is unique in its ability to deal with problems.
8. **D. Jarvis, Student Conservation Association, Public Land Service Program:** He said that the young people in the Gulf States need to be engaged and gave an example of the Greater Yellowstone Corps working after forest fires. He said that similar groups have worked after floods and hurricanes. The Gulf States are particularly deficient in any service Corps, but that the organizations have the ability to engage in new corps development. Young people are ready, willing, and able to serve, but the funding needs to be made available through giving and public charities. He said that the organizations are barely 10% of size that they were during the Great

Depression. 40,000 men and women served in the past year: 70% of their funding is public funding, 30% is philanthropic revenue.

9. **Earl Comstock, lead staffer for Ted Stevens on the Oil Pollution Act of 1990:** He said that the Alaska Whaling Commission was tasked with guarding the resources of subsistence hunters. The Macondo disaster was a full scale test of the ability to respond, and there has been much dissatisfaction with the response. He said that the response at that stage is never going to be adequate and that lives and the economy are always disrupted. All of the equipment was designed to prevent a repeat of the Exxon Valdez spill, but the oil and gas industry objected to all advancements. Prevention is the most important thing that government can do and that requirements should be imposed equally across the industry to give everyone a level playing field.

The oral public comment session for the first day can be found on pages 387 through 414 of the transcript (Attachment #2).

Meeting Recessed by Co-Chairs

5:30 PM

Call to Order and Opening Remarks

9:00 AM

All Commission Members and DFO Present:

Christopher Smith, U.S. Department of Energy, Designated Federal Officer (DFO)

Senator Bob Graham, Co-Chair

The Honorable William Reilly, Co-Chair

Frances Beinecke

Donald Boesch

Terry Garcia

Cherry Murray

Frances Ulmer

Opening Remarks

Christopher Smith: Welcomed the group, called the meeting to order, reviewed the purpose of the Commission, introduced Commission Members, and reviewed the day's agenda.

Senator Bob Graham: He suggested that the land use focus in the 21st century should be on restoring lands that have been damaged by past actions. He said that the Gulf of Mexico is in a premier position to meet the obligation to restore the Nation's natural resources. He presented a number of questions

related to the restoration of the Gulf: should the Gulf be restored to the state it was in before the spill or to something better, how much might it cost, and how should the restoration be organized? He introduced the first panel and Don Boesch as the lead questioner.

Honorable William Reilly: He said that while the most immediate concern has been ended and the environmental damage has been tempered by the capping of the well, the impact and unseen effects will still continue. There are many economic, social, and environmental priorities that will be threatened by the long-term effects of the spill. He said that the oil and gas industry has had a role in the degradation of the Gulf Coast, and so must play a part in the restoration. He stated that the goal should be to move towards creating a healthy and environmentally sustainable Gulf.

The oral opening remarks of the second day can be found on pages 508 through 519 of the transcript (Attachment #2).

Panel I: The Spill, Recovery and the Legacy of Mississippi Delta Management

9:10 AM

Panelists: **Chris Johns, Editor in Chief, *National Geographic***

John Barry, Author, *Rising Tide*, and member of the Louisiana Coastal Protection and Restoration Authority

Prepared Remarks

Chris Johns: He delivered a presentation and said that *National Geographic* magazine has long been a witness to the Gulf region. He said that the devastation of the Gulf region did not start with the *Deepwater Horizon*: it began with the well-intentioned desire to control the Mississippi River. He also said that while U.S. production of oil has decreased overall since 1985, ultra deepwater drilling has increased dramatically since 2004. *Mr. Johns' presentation can be found in Attachment #16*.

John Barry: He said that populated areas in Louisiana are much more vulnerable to hurricane than ever before, and he put forth four questions: how the region reached the current situation, what goals can realistically be accomplished, how those goals may be accomplished, and what could happen if we fail. He contributed data regarding shipping, exports, biodiversity, erosion, and the dependence of the national economy and national security on the Gulf of Mexico, and Louisiana in particular. He said that the Gulf is in a current state of degradation due to the decline of sediment in the Mississippi River, the effect of levees on the replenishment of the land by preventing the natural flooding process, the Gulf Intercoastal Waterway, and the impacts of the oil and gas industry. He stated that whatever governance structure is set up should solicit ideas. *Mr. Barry's statement can be found in Attachment #17*.

The oral remarks of this panel can be found on pages 519 through 539 of the transcript (Attachment #2).

Commission Question and Answer

The Commission asked if the problems associated with material dredged from waterways is an environmental issue, and the panelists said that it is primarily an economic issue. The policy of the Army Corps of Engineers is to dispose of material in the most economic way, and it is more expensive to use dredged material in their projects. The panelists said that to meet the projected needs for additional sand berms, more dredges will have to be built, foreign fleets will have to be brought in, or a combination of the two.

The oral question and answer session for this panel can be found on pages 539 through 541 of the transcript (Attachment #2).

Panel II: Impacts: Environmental and Economic

9:40 AM

Panelists: **Dr. John Farrington, Interim Dean, School of Marine Science and Technology, University of Massachusetts, Dartmouth**

Jane Lyder, Deputy Assistant Secretary, Fish and Wildlife and Parks, U.S. Department of the Interior

Lt. Governor Scott Angelle, Louisiana

Prepared Remarks

Dr. John Farrington: He delivered a presentation that focused on three points: the scientific findings in the aftermath of the Ixtoc I blowout in the Gulf in 1979; research on other oil releases; and his direct experience related to the BP *Deepwater Horizon* oil spill. Based on his experience with past oil spills, he believes that too little attention had been given to the potential for a deepwater oil well blowout. He said that the Nation should not let the lessons from the *Deepwater Horizon* spill fade from memory as has happened with past spills and that funds for deepwater research and development set aside by BP should be released as soon as possible by the responsible government agencies. *Dr. Farrington's statement and presentation can be found in Attachment #18*.

Jane Lyder: She delivered a presentation stating that oil can affect wildlife and habitats in many different ways including physical contact, inhalation, and absorption. The effects of oil contamination increase as you go up the food chain. She said that the full impact of the spill on birds and other migratory wildlife are not known, and many effects will not manifest themselves for years. *Ms. Lyder's statement and presentation can be found in Attachment #19*.

Lt. Governor Scott Angelle: He said that Louisiana has always embraced a management philosophy that encourages oil and gas exploration, as well as a robust fishing industry. Louisiana provides 1/5 of the commercial fisheries catch for the lower 48 states, as well as handles 1/3 of the Nation's domestic oil. There is a lack of any documented case of contamination of Louisiana seafood, which he said proves the effectiveness of fishing management following the oil spill. He listed statistics related to consumer and visitor worries and complaints about seafood and restaurants. He said that the responsible party ignored problems over recent months until he was asked to testify at this meeting. He asked that BOEM file a

weekly report regarding shallow water drilling permits. *Lt. Governor Angelle's statement can be found in Attachment #20*.

The oral remarks of this panel can be found on pages 541 through 563 of the transcript (Attachment #2).

Commission Question and Answer

The Commission asked about the long-term impact of the Ixtoc I well blowout and the availability of scientific studies from that incident, about the impact of the *Deepwater Horizon* spill on wildlife, and if any species are at risk of being severely impacted. The panelists stated that there are no studies about the long-term biological effects of the Ixtoc I spill, nor for the larger area impacted by the incident. The panelists said that one protection effort was to move turtle eggs from a portion of the Gulf Coast to the coast of Florida, away from the impact of the oil. It was decided that moving the turtles would increase the likelihood of their overall survival more than hatching into the oiled Gulf waters following the spill. They said that they do not know what the long-term impact will be on wildlife populations, but there will be monitoring efforts. The panelists said that birds are at risk of being severely impacted, specifically laughing gulls, pelicans, and other migratory birds.

The Commissioners asked which rigs would be likely to resume drilling once the moratorium is lifted, the state of seafood on the Gulf Coast, and the impact of public perception on seafood. They also inquired about food toxicity test results, MMS/BOEM environmental studies and research in the past, and strategic efforts for long-term upper Gulf restoration. The panelists said that they are uncertain which rigs will be able to resume drilling when the moratorium is lifted; there are new regulations for the oil and gas industry, and the industry would like the regulatory agencies to establish a clear set of rules and directions for the rigs. They said that Louisiana seafood has developed a negative public perception across the Nation due to the oil spill, and they believe that the responsible party should be liable for addressing the perception challenges. Independent laboratories have performed robust experiments on Louisiana seafood and there has not been a single incident of seafood toxicity.

The panelists said that there had not been enough funding for deepwater drilling research in the past and that funding should increase so that the industry and government can better understand the science behind the *Deepwater Horizon* oil spill and its effect on the Gulf of Mexico.

The oral question and answer session for this panel can be found on pages 563 through 583 of the transcript (Attachment #2).

Panel III: Elected Officials: The View from the Region

10:30 AM

Panelists: **The Honorable Mary Landrieu, U.S. Senator, Louisiana**

The Honorable Haley Barbour, Governor of Mississippi

Prepared Remarks

The Honorable Mary Landrieu: She said that it is important to provide a way forward for the essential industries that are a part of the Gulf Coast and that the purpose of this discussion is to determine what the Federal Government can do to help. The Mississippi delta region constantly deals with coastal erosion, hurricanes, and other issues related to land loss, including the channelization of the delta, which has led to the region being deprived of sediments that it used to receive. She said that the loss of land in this unique area means that the only true "energy coast" of the U.S. is being lost as well – an economic engine with essential industries such as oil and gas supply, oil and gas refining, tourism, and commercial fishing. She stated that the entire coast of Louisiana and the Gulf deserves protection, and one way to do so would be to secure permanent and immediate funding and revenues by allowing the Gulf Coast states to share in offshore oil production revenues; these states are the only oil-producing states in the U.S. that do not receive any portion of oil production revenues. Senator Landrieu also recommended that the Congressional action to create the Gulf Coast Recovery Council should coordinate closely with the ongoing Natural Resource Damage Assessment (NRDA) process. She said that a portion of the money taken out of the Gulf Coast should be reinvested there to get people back to work. She said that New Orleans is the only part of Louisiana that has a levee system – southern Louisiana is protected by barrier islands, which have been heavily damaged. The people must get back to work to fix the Gulf Coast; the moratorium is doing a great deal of damage because even though existing oil and gas wells are still producing, continued exploration is needed to add to the Nation's domestic reserves. *Senator Landrieu's statement can be found in Attachment #21*.

The Honorable Haley Barbour: He said that Mississippi did not experience the same impact from the spill as Louisiana; the vast majority of what arrived in Mississippi was tar balls and tar patties. The barrier islands received more tar balls than the coastline; there has not been any residual damage, but the fiscal effect on Mississippi has been enormous. Mr. Barbour said that the tourist season was effectively destroyed due to the exaggeration of the effects of the oil by the media, which affected incomes, home and land values, the fishing industry, and employment. He said that the moratorium is causing the most hurt, and the people are anxious to see that the moratorium is not succeeded by a regulatory regime that slows down oil and gas production in the Gulf. A portion of any fines or penalties resulting from the incident should go to the states, and the structures that are to be implemented should be dominated by state governments and not the Federal Government. *Governor Barbour's statement can be found in Attachment #22*.

The oral remarks of this panel can be found on pages 583 through 613 of the transcript (Attachment #2).

Commission Question and Answer:

The Commission asked how money should be allocated from the government's perspective and how to address the states' individual needs, the Gulf Coast's regional needs, and the coastal needs of the individual states. They also asked whether different mechanisms are possible for the NRDA fund distribution, whether the Gulf of Mexico Alliance has provided guidance for the recovery and restoration efforts, and how the fund allocation questions will be resolved amongst the state and federal initiatives. The panelists stated that the recovery and restoration efforts need to be a joint state-federal partnership. They said that at times, unfortunately, a state-federal joint partnership means that the

Federal Government must tell the states what to do, and they believe that any joint partnership should be state-centric, not unilateral, and include an emphasis on the local perspective. The panelists said that they believed that any penalty money should be used for levee restoration, education, environmental remediation, and uses specific to the industry and oil spill aftereffects. They also said that the Commission needs to realize that there are likely to be environmental damages that are currently unknown and unseen.

The Commissioners inquired as to how best address the consequences of such a large oil spill and if the panelists had any recommendations about what should be changed in the law to address the economic consequences. The panelists replied that science may determine that additional resources are needed to address these issues in the future. They said that it was a blessing that the responsible party has such deep pockets, but that would not always be the case, and that a fund should exist to pay for damages from possible future events.

The oral question and answer session of this panel can be found on pages 613 through 635 of the transcript (Attachment #2).

Panel IV: Impacts: The Gulf and Seafood Safety

11:40 AM

Panelists: **Dr. Steven Murawski, Director of Scientific Programs and Chief Science Advisor, National Marine Fisheries Service, NOAA**

Dr. Bill Walker, Director of the Mississippi Department of Marine Resources

Timothy Fitzgerald, Marine Scientist, Oceans Program, Environmental Defense Fund

Prepared Remarks

Dr. Steven Murawski: He said that science has been a critical component of the oil spill response and recovery effort in various ways: responding to the presence of vast quantities of oil, assisting the NRDA, and exploring the long-term recovery of the Gulf's ecosystems and communities. Seafood testing, worker safety, socioeconomic impacts, living marine resources, and air quality monitoring have all been an important part of the response. He said that examples of big -picture science questions include determining where the surface oil has gone, researching the dynamics and importance of the loop current, and finding the issues with seafood safety and living marine resources. Dr. Murawski said that some fishing areas still have not been opened to fishing due to pending sampling. He said that current sampling protocols test for twelve different hydrocarbons, and they have not seen any levels of concern in any samples. *Dr. Murawski's statement and presentation can be found in Attachment #23*.

Dr. Bill Walker: He said that when the BP *Deepwater Horizon* oil spill exploded, Governor Barbour went to work on creating a partnership to protect the state from the approaching oil. The plan called for the team to fight the oil as far from the coast as possible, and they succeeded in keeping 75% of the oil away from the mainland of the Northern Gulf. They made many aerial inspections and water measurements, which resulted in the closing of many fisheries while the tests were being performed. He said that they

collected many samples which were sent to NOAA and the FDA for analysis; and based on credible, scientific data, Mississippi seafood has been safe and healthy to eat throughout the entirety of this event. He said the short- term effects of the spill have been minimal in Mississippi, and they are moving from the spill response to recovery and restoration. BP has pledged $500 million to research the long-term effects of the spill on the coastal environment and that research will help to inform the NRDA, which will determine the appropriate levels of damages. Dr. Walker said that the team effort following this event has been a huge success – the best success story that will never be seen on CNN. *Dr. Walker's statement and presentation can be found in Attachment #24*.

Timothy Fitzgerald: He said that most people have very little connection to and understanding of the seafood that they buy and eat. The top two concerns among buyers of fish are quality and safety. He said that they are going to execute a four part campaign: 1) work with fisherman for more sustainable fishing; 2) establish a rigorous seafood testing program; 3) create a chain of custody system to track fish throughout the supply chain; and 4) highlight the above efforts through an aggressive public relations and marketing campaign to regain consumer confidence relating to Gulf seafood. *Mr. Fitzgerald's statement can be found in Attachment #25*.

The oral remarks of this panel can be found on pages 636 through 664 of the transcript (Attachment #2).

Commission Question and Answer:

The Commission asked what has been done to make seafood toxicity test results available to the public, what coordination was necessary to re-open fishing waters, if there were any sediment contamination issues, and about the status of the campaigns to improve public perception of Gulf seafood. The panelists said that the states cooperated with NOAA, EPA, and the FDA to complete specific fishery closing and opening protocols. Mississippi has held NOAA "dockside chats", or public hearings, to provide the public with data on the toxicity test results, as well as to listen to the concerns of the local people. They said that NOAA is implementing a new subsurface sampling plan to enhance the potential for looking for oil present in seafloor sediment. The FDA health standards for seafood are based on an adult male eating one to two portions per week; but people in the Gulf have diets based on seafood, and they may eat a disproportionate amount. The panelists said that the local and regional marketing campaigns to improve the public perception of seafood have not started. They said that they are negotiating with the responsible party for a budget for a national marketing effort to improve public perception, and the expected range of the budget is $2-3 million.

The oral question and answer session of this panel can be found on pages 664 through 692 of the transcript (Attachment #2).

Panel V: Legal Authorities for Funding and Restoration Management

1:30 PM

Panelists: **Richard Stewart, Professor of Law, New York University**

James Tripp, Senior Counsel, Environmental Defense Fund

Stan Senner, Director of Conservation Science, Ocean Conservancy

Prepared Remarks

Richard Stewart: He said that his legal experience in working on the Exxon Valdez settlement is applicable to work related to the BP *Deepwater Horizon* oil spill. He discussed different liability statutes involved with the oil spill. Natural resource damages are assessed on behalf of natural resource trustees, and federal trustee agencies are determined by the President. These trustees will work together to allocate the settlement money just as the litigants had to work together to avoid a "divide and conquer" strategy by Exxon. *Mr. Stewart's statement can be found in Attachment #26*.

James Tripp: He said that there are two major causes of the degradation of the Mississippi Delta: the management of the Mississippi River, and the footprint of the oil and gas industry (both onshore and offshore). Nearly 10% of the land mass of the delta is made up of oil and gas canals and dredge piles. He believes that the river should be reengineered, re-landscaped, and re-contoured to eliminate some of the dredge piles. Another tool for the EPA to use would be to set up a supplemental project for BP and other parties to fulfill their responsibilities. He recommended that 75% of funds should go to coastal Louisiana. *Mr. Tripp's statement and presentation can be found in Attachment #27*.

Stan Senner: He said that Ocean Conservancy has worked for over two decades to address the restoration of the Gulf of Mexico, emphasizing the coastal and marine ecosystems as a single system. As a result of the *Exxon Valdez* incident, the Gulf Ecosystem Monitoring Program was created. He believes that any funds for the environmental restoration of the Gulf should be earmarked as such to ensure that they cannot be reallocated for other uses in the future. He said that trustees in the *Exxon Valdez* restoration projects could only make decisions unanimously, which ensure a balanced, science-based plan; and Ocean Conservancy recommends that the plan be similar for the Gulf restoration effort. Mr. Senner also recommended a re-opener clause in any Gulf of Mexico settlement to account for unanticipated effects, and Ocean Conservancy advocates maximum public transparency. *Mr. Senner's statement can be found in Attachment #28*.

The oral remarks of this panel can be found on pages 692 through 722 of the transcript (Attachment #2).

Commission Question and Answer:

The Commission asked about the steps necessary to connect NRDA funds to other ongoing restoration programs, what the panelists think about having a "super trustee", what is being done about resources in the deep ocean environment, and if there is any impediment to using NRDA funds for long -term monitoring. They also asked if the $75 million cap on liability would be lifted and how wetlands on private property should be restored. The panelists stated that provisions for how funds will be spent are sufficiently elastic NRDA. They said that a "super trustee" may improve the efficiency of restoration efforts by consolidating the multiple agencies and states into something more manageable. The panelists said that there are a variety of actions that can be taken to preserve and protect deepwater ecosystems and wildlife, but current research has been working with incomplete information, which presents a large opportunity for science. Scientific studies should identify important and sensitive

places, protected areas, and season issues. The panelists said that they envision $2 billion per year for 10 to 12 years for the restoration efforts in the Gulf. They said that what are being restored are not so much resources as "resource services"; the idea should be to restore these resource services that were lost. The Supreme Court of Louisiana said that the state has the right to reintroduce water into wetlands without having to compensate private property owners in any way. The panelists said that lifting the liability cap could deter smaller oil and gas players, but there could be reinsurance options as a solution to that possibility; they did not have any statement as to how high the new liability cap should be if it were to be adjusted in the future.

The oral question and answer session for this panel can be found on pages 722 through 754 of the transcript (Attachment #2).

Panel VI: The States & The Federal Government: Defining a Shared Path for Gulf Restoration

3:00 PM

Panelists: **Garret Graves, Director, Louisiana Office of Coastal Activities**

Terrence "Rock" Salt, Principal Deputy Assistant Secretary of the Army for Civil Works

The Honorable Tom Strickland, Assistant Secretary for Fish and Wildlife and Parks, DOI

Brian McPeek, North American Regional Director, The Nature Conservancy

Prepared Remarks

Garret Graves: He delivered a presentation and said that plans need to be made for the future while understanding current needs. Coastal Louisiana is one of the most productive ecosystems in North America and accounts for much of the shipping in the Nation. He said that before the levees were installed in the 1930's, land mass grew by almost one square mile per year; after the levees were installed, the delta began losing 28 square miles of land per year. He said that operating fund allocation on a consensus basis means that money will be distributed equally, but this ignores other variables that should be weighted appropriately. *Mr. Graves' statement and presentation can be found in Attachment #29*.

Terrance "Rock" Salt: He said that he was unable to have his testimony cleared in time, so his role could be to explain the role of the Army Corps of Engineers in the post-spill recovery and restoration.

The Honorable Tom Strickland: He said that this is a historic moment to repair the oil spill damage as well as work towards the long- term Gulf restoration. A roadmap for the restoration has largely been prepared and developed; only the funding and organizational discipline are still required. He said that the shift from response to the recovery and restoration requires cooperation between the states and the Federal Government. The assessment efforts try to determine the effects of the damage caused by the spill to allow for best management of the recovery and restoration projects. He stated that the Gulf Coast had been degraded by human activities before the spill, and each disaster in the past has made

the ecosystem more vulnerable; the organizational structure and accompanying dollars to implement restoration plans are what have been missing to this point. The recovery and restoration as a result of the *Deepwater Horizon* spill are a tremendous opportunity to address many issues in the Gulf of Mexico. *The Honorable Mr. Strickland's statement can be found in Attachment #30*.

Brian McPeek: He said that the Nature Conservancy is an international non-profit that protects threatened acreage and has worked extensively in the Gulf of Mexico and the Caribbean. The regional economy of the Gulf Coast is closely tied to the oil and gas and shipping industries operating in the area. He stated that BP must be held accountable for the full costs of the disaster, but the Nation must go far beyond just repairing the damage that was done by the spill. A comprehensive restoration strategy should include rebuilding estuaries, coastal habitats, and barrier beaches and islands; protecting and restoring coastal marine biodiversity; and protecting water quality to help maintain the healthy production of commercial and recreational fisheries. The Nature Conservancy has recommended that a restoration committee be established by Congress to include federal agencies, state and local governments, and other organizations in the private sector. They also advocate that an increase in the per-barrel-of-oil tax be dedicated to long -term Gulf restoration. *Mr. McPeek's statement can be found in Attachment #31*.

The oral remarks of this panel can be found on pages 754 through 790 of the transcript (Attachment #2).

Commission Question and Answer:

The Commission asked the panelists for their thoughts on designing the Gulf restoration process: how to ensure a fair and equitable role for the states, what the state and federal shares of the Clean Water Act should be, and the legal status of actions that the states could take to draw down the federal share of the fines. The panelists stated that the most successful aspect of the restoration process in Florida's Everglades was that the process was bottom-up, science-based, and system-focused with an emphasis on accountability. Entities that can show evidence of damages and loss of resources can make claims against the defendant. They said that each state has substantial efforts or plans that have been in place for years that can help inform the NRDA process; the main difference between the Everglades and the Gulf of Mexico is that the former was more of a watershed issue, whereas the Gulf is a coastal environment. The panelists told the Commission that the Mabus Report* recommended that a large portion of the Clean Water Act fines be transferred to the states for restoration. Typically, the split between federal and state portions is 65/35; but in the Everglades, the arrangement was 50/50.

* *The Mabus Report can be found on the Commission web site at* http://www.oilspillcommission.gov/library#supporting-documents

The Commission asked whether or not Louisiana is still actively leasing for drilling, about the impact of the construction of sand berms off the Gulf Coast, and for the panelists' reactions to the recently released Mabus Report. The panelists told them that Louisiana is still actively leasing, but the coastal zone management permitting process has been fundamentally restructured to require 125% beneficial use of dredge material for any type of impact on the coastal area. They said that the sand berms were a pre-approved oil protection measure; a science panel was created to review the berms and decided to

implement them to battle with the oil farther away from the shoreline. One of the panelists said that they were briefed on the Mabus Report earlier in the day and commented that it has a Gulf-wide focus, which includes all of the major elements of a restoration plan. They said that the Mabus Report highlighted the two key issues: governance and funding. The NRDA process will not be sufficient to accomplish all that is required, and the funding will not be enough.

The oral question and answer session for this panel can be found on pages 790 through 834 of the transcript (Attachment #2).

Public Comment

5:00 PM

1. **Allison Fisher, public citizen:** She submitted a written statement and had three recommendations: 1) urge the Commission to fully investigate BP's ability to control information surrounding the spill and response operations; 2) call for specific legislation regarding the oil spill; the House bill has passed, and the Senate bill has not; and 3) urge passing of regulatory reforms, the strengthening of environmental standards, and the establishment of a citizen's advisory council.
2. **Jasmine Edo, Environment America:** She said that the scale and scope of the biological impact is like nothing that has ever been seen before. Many wetlands and sensitive coastal regions were affected by the spill, and it is hard to calculate the full effect due to the unknown of the long-term. BP and its partners should be held responsible for the full impact and set up funds similar to those proposed to study long -term health effects.
3. **Cynthia Sarthou, Gulf Restoration Network:** The Gulf Restoration Network is concerned that the coastal marine environment is not garnering enough attention. She said that a significant portion of funding should go towards studying and understanding marine impacts in the Gulf. Whale populations, shark populations, and other groups may have been damaged beyond what is currently known. She voiced concerns about the Gulf of Mexico Alliance, but the Mabus Report plan is promising. She said that it is necessary to make sure that the oil and gas industry is vigilant; that there is vigorous oversight; and that, in the future, response equipment is available and can be deployed quickly.

The oral public comment session for the second day can be found on pages 834 through 844 of the transcript (Attachment #2).

Meeting Adjourned by Co-Chairs

5:30 PM

Honorable William Reilly: He thanked everyone for participating and closed the meeting.

Table of Attachments

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3. Robert Graham, Commission Co-Chair (taken from transcript)
4. William Reilly, Commission Co-Chair (taken from transcript)

Panelist Testimony

5. Doug Suttles, Chief Operating Officer for Exploration and Production, BP
6. William "Billy" Nungesser, President of Plaquemines Parish, Louisiana
7. Dr. Ian MacDonald, Professor of Oceanography, Department of Earth, Ocean and Atmospheric Science, Florida State University
8. Dr. Richard Camilli, Assistant Scientist, Department of Applied Ocean Physics and Engineering, Woods Hole Oceanographic Institution
9. Dr. Terry Hazen, Senior Scientist, Head of the Ecology Department and DOE Distinguished Scientist, Earth Sciences Division, Lawrence Berkley National Laboratory
10. Rear Admiral Mary Landry, Commander, Eighth Coast Guard District, U.S. Coast Guard
11. The Honorable Ken Salazar, Secretary of the Interior
12. The Honorable Mark Begich, U.S. Senator, Alaska
13. Pete Slaiby, Vice President for Exploration & Production, Shell Alaska
14. Edward Itta, Mayor of North Slope Borough, Alaska
15. Dr. Dennis Takahasi-Kelso, Executive Vice President, Ocean Conservancy
16. Chris Johns, Editor in Chief, *National Geographic*

17. John Barry, Author, *Rising Tide*, member of the Louisiana Coastal Protection and Restoration Authority
18. Dr. John W. Farrington, Interim Dean, School of Marine Science and Technology, University of Massachusetts, Dartmouth
19. Jane Lyder, Deputy Assistant Secretary, Fish and Wildlife and Parks, Department of the Interior
20. Lt. Governor Scott Angelle, Louisiana
21. The Honorable Mary Landrieu, U.S. Senator, Louisiana
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24. Dr. Bill Walker, Director of the Mississippi Department of Marine Resources
25. Timothy Fitzgerald, Marine Scientist, Oceans Program, Environmental Defense Fund
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Executive Order

U.S. GOVERNMENT INFORMATION GPO

Executive Order 13543—National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

May 21, 2010

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Establishment. There is established the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (the "Commission").

Sec. 2. Membership. (a) The Commission shall be composed of not more than 7 members who shall be appointed by the President. The members shall be drawn from among distinguished individuals, and may include those with experience in or representing the scientific, engineering, and environmental communities, the oil and gas industry, or any other area determined by the President to be of value to the Commission in carrying out its duties.

(b) The President shall designate from among the Commission members two members to serve as Co-Chairs.

Sec. 3. Mission. The Commission shall:

(a) examine the relevant facts and circumstances concerning the root causes of the Deepwater Horizon oil disaster;

(b) develop options for guarding against, and mitigating the impact of, oil spills associated with offshore drilling, taking into consideration the environmental, public health, and economic effects of such options, including options involving:

> (1) improvements to Federal laws, regulations, and industry practices applicable to offshore drilling that would ensure effective oversight, monitoring, and response capabilities; protect public health and safety, occupational health and safety, and the environment and natural resources; and address affected communities; and
>
> (2) organizational or other reforms of Federal agencies or processes necessary to ensure such improvements are implemented and maintained.

(c) submit a final public report to the President with its findings and options for consideration within 6 months of the date of the Commission's first meeting.

Sec. 4. Administration. (a) The Commission shall hold public hearings and shall request information including relevant documents from Federal, State, and local officials, nongovernmental organizations, private entities, scientific institutions, industry and workforce representatives, communities, and others affected by the Deepwater Horizon oil disaster, as necessary to carry out its mission.

(b) The heads of executive departments and agencies, to the extent permitted by law and consistent with their ongoing activities in response to the oil spill, shall provide the Commission such information and cooperation as it may require for purposes of carrying out its mission.

(c) In carrying out its mission, the Commission shall be informed by, and shall strive to avoid duplicating, the analyses and investigations undertaken by other governmental, nongovernmental, and independent entities.

(d) The Commission shall ensure that it does not interfere with or disrupt any ongoing or anticipated civil or criminal investigation or law enforcement activities or any effort to recover response costs or damages arising out of the Deepwater Horizon explosion, fire, and oil spill. The Commission shall consult with the Department of Justice concerning the Commission's activities to avoid any risk of such interference or disruption.

(e) The Commission shall have a staff, headed by an Executive Director.

(f) The Commission shall terminate 60 days after submitting its final report.

Sec. 5. General Provisions. (a) To the extent permitted by law, and subject to the availability of appropriations, the Secretary of Energy shall provide the Commission with such administrative services, funds, facilities, staff, and other support services as may be necessary to carry out its mission.

(b) Insofar as the Federal Advisory Committee Act, as amended (5 U.S.C. App.) (the "Act"), may apply to the Commission, any functions of the President under that Act, except for those in section 6 of the Act, shall be performed by the Secretary of Energy in accordance with guidelines issued by the Administrator of General Services.

(c) Members of the Commission shall serve without any additional compensation for their work on the Commission, but shall be allowed travel expenses, including per diem in lieu of subsistence, to the extent permitted by law for persons serving intermittently in the Government service (5 U.S.C. 5701–5707).

(d) Nothing in this order shall be construed to impair or otherwise affect:

(1) authority granted by law to a department, agency, or the head thereof; or

(2) functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(e) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

BARACK OBAMA

The White House,
May 21, 2010.

[Filed with the Office of the Federal Register, 8:45 a.m., May 25, 2010]

NOTE: This Executive order was released by the Office of the Press Secretary on May 22, and it was published in the *Federal Register* on May 26.

Categories: Executive Orders : National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, establishment.

Subjects: BP Deepwater Horizon Oil Spill and Offshore Drilling, National Commission on the.

DCPD Number: DCPD201000410.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Federal Resgister

must make your request for an oral statement at least 5 business days before the meeting. Members of the public will be heard in the order in which they sign up at the beginning of the meeting. Reasonable provision will be made to include the scheduled oral statements on the agenda. The Chair of the Committee will make every effort to hear the views of all interested parties. If you would like to file a written statement with the Committee, you may do so either before or after the meeting. The Chair will conduct the meeting to facilitate the orderly conduct of business.

Minutes: The minutes of the meeting will be available for public review and copying at *http://www.brdisolutions.com/publications/default.aspx#meetings.*

Issued at Washington, DC, on September 10, 2010.

Carol A. Matthews,

Committee Management Officer.

[FR Doc. 2010–23116 Filed 9–15–10; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Environmental Management Site-Specific Advisory Board, Portsmouth

AGENCY: Department of Energy (DOE).

ACTION: Notice of open meeting.

SUMMARY: This notice announces an Energy Parks Initiative Workshop of the Environmental Management Site-Specific Advisory Board (EM SSAB), Portsmouth. The Federal Advisory Committee Act (Pub. L. 92–463, 86 Stat. 770) requires that public notice of this meeting be announced in the **Federal Register.**

DATES: Thursday, September 23, 2010, 6 p.m.–8 p.m.

ADDRESSES: Ohio State University, Endeavor Center, 1862 Shyville Road, Piketon, Ohio 45661.

FOR FURTHER INFORMATION CONTACT: Joel Bradburne, Deputy Designated Federal Officer, Department of Energy Portsmouth/Paducah Project Office, Post Office Box 700, Piketon, Ohio 45661, (740) 897–3822, *Joel.Bradburne@lex.doe.gov.*

SUPPLEMENTARY INFORMATION: *Purpose of the Board:* The purpose of the Board is to make recommendations to DOE–EM and site management in the areas of environmental restoration, waste management and related activities.

Tentative Agenda

- Portsmouth SSAB Involvement with Energy Parks—Val Francis, Co-Chair.
- Energy Parks Initiative Presentation—Mark Gilbertson, DOE–Headquarters.
- Break.
- Questions and Answers from Comment Cards.
- Adjourn.

Public Participation: The meeting is open to the public. The EM SSAB, Portsmouth, welcomes the attendance of the public at its advisory committee meetings and will make every effort to accommodate persons with physical disabilities or special needs. If you require special accommodations due to a disability, please contact Joel Bradburne in advance of the meeting at the phone number listed above. The Deputy Designated Federal Officer is empowered to conduct the meeting in a fashion that will facilitate the orderly conduct of business. This notice is being published less than 15 days prior to the meeting date due to programmatic issues that had to be resolved prior to the meeting date.

Issued at Washington, DC, on September 10, 2010.

Carol A. Matthews,

Committee Management Officer.

[FR Doc. 2010–23117 Filed 9–15–10; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

AGENCY: Department of Energy, Office of Fossil Energy.

ACTION: Notice of open meeting.

SUMMARY: This notice announces an open meeting of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (the Commission). The Commission was organized pursuant to the Federal Advisory Committee Act (Pub. L. 92–463, 86 Stat. 770) (the Act). The Act requires that agencies publish these notices in the **Federal Register.** The Charter of the Commission can be found at: *http://www.OilSpillCommission.gov.*

DATES: Monday, September 27, 2010, 9 a.m.–4:30 p.m., and Tuesday, September 28, 2010, 9 a.m.–4:30 p.m.

ADDRESSES: Washington Marriott Wardman Park, 2660 Woodley Park Road, NW., Washington, DC 20008; telephone number: 1–202–328–2000.

FOR FURTHER INFORMATION CONTACT: Christopher A. Smith, Designated Federal Officer, Mail Stop: FE–30, U.S. Department of Energy, 1000 Independence Avenue, SW., Washington DC 20585; telephone (202) 586–0716 or facsimile (202) 586–6221; e-mail: *BPDeepwaterHorizonCommission@hq.doe.gov.*

SUPPLEMENTARY INFORMATION:

Background: The President directed that the Commission be established to examine the relevant facts and circumstances concerning the root cause of the BP Deepwater Horizon explosion, fire, and oil spill and to develop options to guard against, and mitigate the impact of, any oil spills associated with offshore drilling in the future.

The Commission is composed of seven members appointed by the President to serve as special Government employees. The members were selected because of their extensive scientific, legal, engineering, and environmental expertise, and their knowledge of issues pertaining to the oil and gas industry. Information on the Commission can be found at its Web site: *http://www.OilSpillCommission.gov.*

Purpose of the Meeting: Inform the Commission members about the relevant facts and circumstances concerning (1) spill response following the BP Deepwater Horizon oil disaster, and (2) impacts of the spill on the Gulf of Mexico and approaches to long-term restoration. The meeting will provide the Commission with the opportunity to hear presentations and statements from various experts and provide additional information for the Commission's consideration.

Tentative Agenda: The meeting is expected to start on September 27 at 9 a.m. Presentations to the Commission are expected to begin shortly thereafter and will conclude at approximately 4 p.m. The meeting will continue on September 28 at 9 a.m. with presentations to the Commission. Public comments can be made on Monday, September 27 and Tuesday, September 28 from 4 p.m. to 4:30 p.m., respectively. The final agenda will be available at the Commission's Web site: *http://www.OilSpillCommission.gov.*

Public Participation: The meeting is open to the public, with capacity and seats available on a first-come, first-serve basis. The Designated Federal Officer is empowered to conduct the meeting in a fashion that will facilitate the orderly conduct of business.

Approximately one-half hour will be reserved for public comments each day for a total of one hour. Time allotted per

speaker will be three minutes. Opportunity for public comment will be available on September 27 and September 28, *tentatively* from 4 p.m. to 4:30 p.m. each day. Registration for those wishing to request an opportunity to speak opens onsite each day at 8 a.m. Speakers will register to speak on a first-come, first-serve basis each day. Members of the public wishing to provide oral comments are encouraged to provide a written copy of their comments for collection at the time of onsite registration.

Those not able to attend the meeting may view the meeting live on the Commission's Web site: *http://www.OilSpillCommission.gov.* Those individuals who are not able to attend the meeting, or who are not able to provide oral comments during the meeting, are invited to send a written statement to Christopher A. Smith, Mail Stop FE–30, U.S. Department of Energy, 1000 Independence Ave., SW., Washington DC 20585, or e-mail: *BPDeepwaterHorizionCommission@hq.doe.gov.*

Minutes: The minutes of the meeting will be available at the Commission's Web site: *http://www.OilSpillCommission.gov* or by contacting Mr. Smith. He may be reached at the postal or e-mail addresses above.

Accommodation for the hearing impaired: A sign language interpreter will be onsite for the duration of the meeting.

Issued in Washington, DC, on September 10, 2010.

Carol A. Matthews,

Committee Management Officer.

[FR Doc. 2010–23118 Filed 9–15–10; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Environmental Management Site-Specific Advisory Board, Idaho National Laboratory

AGENCY: Department of Energy.

ACTION: Notice of open meeting.

SUMMARY: This notice announces a meeting of the Environmental Management Site-Specific Advisory Board (EM SSAB), Idaho National Laboratory. The Federal Advisory Committee Act (Pub. L. No. 92–463, 86 Stat. 770) requires that public notice of this meeting be announced in the **Federal Register**.

DATES: Wednesday, September 29, 2010; 8 a.m.–5 p.m.

Opportunities for public participation will be from 1:30 p.m. to 1:45 p.m. and from 3:30 p.m. to 3:45 p.m.

These times are subject to change; please contact the Federal Coordinator (below) for confirmation of times prior to the meeting.

ADDRESSES: Coeur d'Alene Resort, 115 South Second Street, Coeur d'Alene, Idaho 83814.

FOR FURTHER INFORMATION CONTACT: Robert L. Pence, Federal Coordinator, Department of Energy, Idaho Operations Office, 1955 Fremont Avenue, MS–1203, Idaho Falls, Idaho 83415. Phone (208) 526–6518; Fax (208) 526–8789 or e-mail: *pencerl@id.doe.gov* or visit the Board's Internet home page at: *http://www.inlemcab.org.*

SUPPLEMENTARY INFORMATION: *Purpose of the Board:* The purpose of the Board is to make recommendations to DOE–EM and site management in the areas of environmental restoration, waste management, and related activities.

Tentative Topics (agenda topics may change up to the day of the meeting; please contact Robert L. Pence for the most current agenda):

- Progress to Cleanup.
- Safety Performance Program—Idaho Completion Project.
- Overview Legacy Management—Long-Term Land Use at Idaho National Laboratory.
- Integrated Waste Treatment Unit.
- Remote-Handled Low-Level Waste.
- Buried Waste Lessons Learned—Idaho and Hanford Sites.

Public Participation: The EM SSAB, Idaho National Laboratory, welcomes the attendance of the public at its advisory committee meetings and will make every effort to accommodate persons with physical disabilities or special needs. If you require special accommodations due to a disability, please contact Robert L. Pence at least seven days in advance of the meeting at the phone number listed above. Written statements may be filed with the Board either before or after the meeting. Individuals who wish to make oral presentations pertaining to agenda items should contact Robert L. Pence at the address or telephone number listed above. The request must be received five days prior to the meeting and reasonable provision will be made to include the presentation in the agenda. The Deputy Designated Federal Officer is empowered to conduct the meeting in a fashion that will facilitate the orderly conduct of business. Individuals wishing to make public comments will be provided a maximum of five minutes to present their comments.

Minutes: Minutes will be available by writing or calling Robert L. Pence, Federal Coordinator, at the address and phone number listed above. Minutes will also be available at the following Web site: *http://www.inlemcab.org/meetings.html.*

Issued at Washington, DC, on September 10, 2010.

Carol A. Matthews,

Committee Management Officer.

[FR Doc. 2010–23119 Filed 9–15–10; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Energy Information Administration

Agency Information Collection Activities: Submission for OMB Review; Comment Request

AGENCY: U.S. Energy Information Administration (EIA), Department of Energy (DOE).

ACTION: Agency information collection activities: Submission for OMB review; comment request.

SUMMARY: The EIA has submitted the forms EIA–63A, "Annual Solar Thermal Collector Manufacturers Survey," EIA–63B, "Annual Photovoltaic Module/Cell Manufacturers Survey," and the EIA–902, "Annual Geothermal Heat Pump Manufacturers Survey," to the Office of Management and Budget (OMB) for review and a three-year extension under section 3507(h)(1) of the Paperwork Reduction Act of 1995 (Pub. L. 104–13) (44 U.S.C. 3501 *et seq.*).

DATES: Comments must be filed by October 18, 2010. If you anticipate that you will be submitting comments but find it difficult to do so within that period, you should contact the OMB Desk Officer for DOE listed below as soon as possible.

ADDRESSES: Send comments to OMB Desk Officer for DOE, Office of Information and Regulatory Affairs, Office of Management and Budget. To ensure receipt of the comments by the due date, submission by FAX (202–395–7285) or e-mail to *Christine_J._Kymn@omb.eop.gov* is recommended. The mailing address is 725 17th Street, NW., Washington, DC 20503. The OMB Desk Officer may be telephoned at (202) 395–4638. (A copy of your comments should also be provided to EIA's Statistics and Methods Group at the address below.)

FOR FURTHER INFORMATION CONTACT: Requests for additional information should be directed to Alethea Jennings. To ensure receipt of the comments by the due date, submission by FAX (202–

National Commission on the
BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Memorandum on Acting Designated Federal Officer

MEMORANDUM FOR FILE

TO: NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

FROM: CHRISTOPHER A. SMITH
DESIGNATED FEDERAL OFFICER
NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

SUBJECT: **Acting Designated Federal Officer**

I hereby designate Elena Melchert, Committee Manager for the Designated Federal Officer, to serve as the Acting Designated Federal Officer for the meeting of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling on September 27, 2010, in Washington, D.C.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Briefing Book

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

Meeting #3: Response and Restoration

September 27-28, 2010

The Washington Marriott Wardman Park Hotel

2660 Woodley Park Rd. N.W., Washington, D.C. 20008

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National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

DECISION-MAKING WITHIN THE UNIFIED COMMAND

--Draft--

Staff Working Paper No. 3[1]

The response to the Deepwater Horizon spill continues to the present. As of July 15, 2010—the day the well stopped flowing—the response involved approximately 44,000 responders; more than 6,870 vessels (including skimmers, tugs, barges, and recovery vessels); approximately 4.12 million feet of boom; 17,500 National Guard troops from Gulf Coast states; five states; multiple corporations; and untold hours of work by federal, state, and local officials; employees or contractors of BP; and private citizens.[2] The spill response is governed by the National Contingency Plan (NCP), a set of federal regulations that prescribe how the government will respond to oil spills. In some respects, the response effectively implemented the provisions of the plan and helped to mitigate the most serious negative impacts of the spill. In other respects, the plan was inadequate to handle the scale of the spill—its magnitude, duration, and effects on many stakeholders. This working paper describes the structure of the spill response and the roles of various government and private actors within that structure. The paper identifies situations in which responders altered, or operated outside of, the National Contingency Plan structure and suggests possible recommendations for improvement of that structure in the future.

Issues for the Commission To Consider:

- ***Scale and Structure of the Response***: Was the structure of the response adequate for the nature of the spill, and was that structure put into place quickly enough?
- ***Role of the Responsible Party***: Did BP exercise too much control over the response? If not, what factors led to the public perception that BP, and not the government, was in charge of the response?
- ***Interaction with State and Local Officials***: Does the NCP appropriately integrate state and local officials in the response, and were such officials appropriately involved in this response? Should the NCP and existing contingency planning documents be changed to create a larger or clearer role for state and local officials in oil spill response?

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[1] Staff Working Papers are written by the staff of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling for the use of members of the Commission. They are preliminary and do not necessarily reflect the views either of the Commission as a whole or of any of its members. In addition, they may be based in part on confidential interviews with government and non-government personnel.

[2] Press Release, Deepwater Horizon Incident Joint Information Center, Ongoing Administration-wide response to the Deepwater BP Oil Spill (July 15, 2010), *available at* http://app.restorethegulf.gov/go/doc/2931/784431/.

I. Background: The National Contingency Plan and the Unified Command Structure

The National Oil and Hazardous Substances Pollution Contingency Plan, or National Contingency Plan (NCP), is the federal government's blueprint for responding to both oil spills and hazardous substance releases.[3] Specifically, the NCP establishes the National Response System, a multi-tiered and coordinated national response strategy. Key components of the National Response System include:[4]

- National Response Team (NRT): The NRT is the organization of sixteen federal departments and agencies[5] responsible for coordinating emergency preparedness and response to oil and hazardous substance pollution incidents.
- On-Scene Coordinator: The On-Scene Coordinator directs the response efforts and coordinates all other efforts at the scene.[6] For spills of oil and hazardous substances on land, the Environmental Protection Agency (EPA) provides the On-Scene Coordinator. For oil spills in coastal waters, the Coast Guard provides the On-Scene Coordinator. In general, Coast Guard Captains of the Port serve as On-Scene Coordinators for their particular area. On-Scene Coordinators oversee the Unified Area Command (UAC).
- Unified Area Command (UAC): The UAC is made up of the Federal On-Scene Coordinator, the State On-Scene Coordinator, and the responsible party. The UAC supervises the work of the RRTs as well as the Incident Command Posts (ICPs)
- National Incident Commander: Once an oil spill is classified as a Spill of National Significance, the President designates a National Incident Commander to provide national level-support for the operational response. (In this paper, the National Incident Commander will be referred to as such, and the National Incident Command post he directs will be referred as the NIC.) The On-Scene Coordinator maintains authority for response operations as directed in the NCP.
- Regional Response Teams (RRTs): The RRTs are composed of regional representatives of each NRT member agency, state governments, and local governments.[7] The two principal components of each RRT are (1) a standing team, which consists of designated representatives from each participating federal agency, state governments, and local governments (as agreed upon by the states); and (2) incident-specific teams formed from the standing team when the RRT is activated for a response. The United States Coast Guard leads the RRTs during responses to oil spills in coastal waters.

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[3] The NCP provisions specific to oil spill response are codified in 40 C.F.R. § 300, Subpart D.

[4] Graphics depictions of the basic NRS structure and the relationship of the various plans incorporated into the NCP are included as background information.

[5] These agencies include the United States Coast Guard., the Environment Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), the Department of the Interior, the Department of Justice, and the Federal Emergency Management Agency (FEMA), as well as other agencies. 40 C.F.R. § 300.175(b).

[6] For the spill, the Unified Area Command was first located in Robert, Louisiana and later moved to New Orleans, Louisiana. Incident Command Posts were established in Houma, Louisiana, Mobile, Alabama, Miami, Florida, and Houston, Texas.

[7] In the spill-affected area there were two RRTs corresponding to the two "regions" involved: (1) Arkansas, Louisiana, New Mexico, Oklahoma, and Texas (Reg. IX); and (2) Mississippi, Alabama, Florida, Georgia, Tennessee, North Carolina, South Carolina, Kentucky (Reg. II).

- Area Committees: Area Committees are composed of personnel from federal, state, and local agencies.[8] The primary function of each Area Committee is to prepare an Area Contingency Plan for its designated area, which for the coastal zone is each Coast Guard Captain of the Port zone. Area Contingency Plans are written to set a framework for joint response efforts in the event of a spill.

Congress first established the NCP in 1968 after the 37-million gallon *Torrey Canyon* tanker spill off the coast of England. The Federal Water Quality Act of 1970, which became the Clean Water Act in 1972, required the President to publish a NCP.[9] Although a version of the NCP was in place at the time of the *Exxon Valdez* spill,[10] Congress responded to that spill by passing the Oil Pollution Act of 1990, which directed the President to expand the NCP.[11] The authority to expand the NCP was later delegated to EPA,[12] which implemented this mandate with amendments to the NCP promulgated in 1994.[13]

The 1994 amendments to the NCP focused on expanding federal authority to coordinate effective communication and deployment of equipment—two problems that plagued the *Exxon Valdez* response.[14] Specifically, the amendments prescribed additional responsibilities for the On-Scene Coordinators and strengthened the On-Scene Coordinator's ability to direct the on-scene response.[15] The amendments also called for the creation of Area Committees and Area Contingency Plans under the leadership of the On-Scene Coordinator.[16] To ensure that future contingency plans would not underestimate the potential size of a spill as they had in the *Exxon Valdez* disaster, the 1994 amendments required consideration of a worst-case discharge scenario.[17] Finally, the EPA compiled general oil discharge response requirements into a single document to aid responders.[18]

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[8] In the spill-affected states there are two "areas" designated for Louisiana, three areas designated for Texas, three areas designated for Northwest/West Florida, and one area designated for Mississippi/Alabama. These areas are each a Captain of the Port zone, and each have their own ACP. Their respective ACPs were combined to form the One Gulf Plan, which includes each individual plan as an appendix.

[9] *See* Clean Water Act, Pub. L. No. 92-500, § 311(j), 86 Stat. 816, 862 (1972).

[10] In fact, six applicable contingency plans were in place at the time of the *Exxon Valdez* spill. The five other plans that operated along with the NCP were the Alyeska, Captain of the Port (OSC), Regional, Alaska, and Exxon contingency plans. *See* NATIONAL RESPONSE TEAM, EXXON VALDEZ OIL SPILL: A REPORT TO THE PRESIDENT 6-8 (May 1989).

[11] Oil Pollution Act of 1990, Pub. L. No. 101-380, 104 Stat. 484, primarily codified at 33 U.S.C. 2701 *et seq.* [hereinafter OPA 90].

[12] *See* OPA 90 §§ 4201, 4202.

[13] *See* Rules and Regulations, Environmental Protection Agency, 40 C.F.R. Parts 9 and 300, National Oil and Hazardous Substances Pollution Contingency Plan, 59 Fed. Reg. 47,384 (Sept. 15, 1994).

[14] *See id.*

[15] *See id.*

[16] *See id.* at 47,384 ("These committees and plans are designed to improve coordination among the national, regional, and local planning levels and to enhance the availability of trained personnel, necessary equipment, and scientific support that may be needed to adequately address all discharges.").

[17] *See id.*.

[18] *Id.* at 47,414; 40 C.F.R. Part 300 Appendix E. This appendix is simply a concise restatement of the regulations set forth throughout 40 C.F.R. Part 300; it does not add any substantive regulations.

II. The Unified Command

The guiding concept of the NCP is a "unified command system" that "brings together the functions of the Federal Government, the state government, and the responsible party to achieve an effective and efficient response."[19] The magnitude of the response to the Deepwater Horizon spill necessitated the build-out of an elaborate organizational structure with accompanying delegation of responsibilities.

A. Setting the Structure

The NCP vests the Federal On-Scene Coordinator with authority over the command system. Although the unified command system is designed to bring together different stakeholders to make decisions, one individual needs to have ultimate decision-making power in the event of a conflict. Under the NCP, that individual is the Federal On-Scene Coordinator. The Coast Guard pre-designates the official who will serve as Federal On-Scene Coordinator, and that individual has responsibilities for contingency planning and coordination even before a spill occurs. For example, the Captain of the Port for the coastal zone where a spill occurs will generally be the Federal On-Scene Coordinator. The Federal On-Scene Coordinator is required to oversee the development of the Area Contingency Plan, which is coordinated through the Regional Response Team and designated state and local representatives.[20] The Federal On-Scene Coordinator can change as the nature of the event changes to require a larger response. The NCP gives the Federal On-Scene Coordinator the authority to oversee the incident command structure and to expand it as she sees necessary.

In this case, the first Federal On-Scene Coordinator was the Captain of the Port of New Orleans, Captain Paradis, because his sector was responding to the fire and conducting search and rescue missions. Once the response called for a Unified Area Command to be stood up, Admiral Landry, as commander of the Eighth Coast Guard District, became the Federal On-Scene Coordinator.[21] In the first days of the spill, responders established a Unified Area Command post at Robert, LA in a BP training facility, and set up an Incident Command Post in Houma, LA.[22] BP had immediately set up a command post immediately in Houston, and Coast Guard responders went there to set up a full Incident Command Post as well. On June 1, responders established the Incident Command Post at Mobile, bringing the total of forward-operating Incident Command Posts to three.

The response was also supervised at a national level by a National Incident Commander. On April 29, 2010, the Coast Guard designated the disaster a "Spill of National Significance" and named a National Incident Commander.[23] This disaster marked the first time the "Spill of National Significance" designation was used. A spill of national significance is defined as "a spill which due to its severity, size, location, actual or potential impact on the public health and welfare or the environment, or the necessary response effort, is so complex that it requires

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[19] 40 C.F.R. § 300.105.

[20] 40 C.F.R. § 300.120(e).

[21] On June 1, Admiral Landry returned to her Eighth District duties to prepare for hurricane season, and Admiral James Watson became FOSC. He later transferred the position to Admiral Paul Zukunft.

[22] Captain Paradis became the leader of the incident command post at Houma; he was assisted by Captain Edwin Stanton, who would formally take command on May 28.

[23] 40 C.F.R. § 300.323; Campbell Robertson, *White House Takes a Bigger Role in the Oil Spill Cleanup*, N.Y. TIMES (Apr. 29, 2009).

extraordinary coordination of federal, state, local, and responsible party resources to contain and cleanup the discharge."[24] The National Incident Command (NIC) can only be established, and the National Incident Commander named, after a spill of national significance is declared. The NCP provision creating the position of National Incident Commander provides that the Commander "will assume the role of the [Federal On-Scene Coordinator] in communicating with affected parties and the public, and coordinating federal, state, local, and international resources at the national level." The NCP is otherwise silent on the role of the National Incident Commander, who can serve in the position, or what tasks the he or she will handle instead of the Federal On-Scene Coordinator.

Because of this lack of regulatory guidance, the NIC set up during the Deepwater Horizon response was based largely on the National Incident Commander's view of what his role and the role of his staff should be. The NIC, as envisioned by Admiral Allen, primarily functioned as a national coordination and communications center to deal with high-level political and media inquiries so that the Unified Area Command and the Incident Command Posts could focus on response efforts. The goal was for the NIC not to direct tactics or response operations but to deal with political and high-level strategy issues associated with the response. Similarly, the goal of the Federal On-Scene Coordinator and the Unified Area Command was not to direct response operations, but rather to coordinate resources, communications, and the relationship with the responsible party. Tactical and operational decisions were intended to be made at the Incident Command Post level.

B. Speed of Establishing Command

Though some of the command structure was put in place very quickly, in other respects the mobilization of resources to combat the spill seemed to lag. For about nine days, Deepwater Horizon response efforts continued with the Federal On-Scene Coordinator at the top of the command structure. National leaders such as Deputy Secretary of the Interior David Hayes were involved, but the response was still largely regional in nature—the President had not been to the region, the Cabinet secretaries had not yet become involved, and the responders were from the local area. High-level conversations regarding whether a spill of national significance declaration and a National Incident Commander appointment were necessary occurred in the first week of the spill, but the declaration was only made on April 29, 2010.[25] Admiral Allen, then Commandant of the Coast Guard, was appointed National Incident Commander the following day.

For the first ten days of the spill, it appears that a sense of over-optimism affected responders.[26] Responders almost uniformly noted that, while they understood that they were facing a major spill, they believed that BP would get the well under control. Coast Guard officials thought that the oil would not come ashore and hesitated to open additional command posts.[27] They viewed the response as an "incident" rather than a "campaign," which is what it certainly became.[28] While it is not at all clear that this misplaced optimism affected any individual response effort, it may have affected the scale and speed with which national

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[24] 40 C.F.R. § 300.5.
[25] Interview with Coast Guard official.
[26] Interview with Coast Guard official.
[27] Interview with Coast Guard official.
[28] Interview with Coast Guard official.

resources were brought to bear. In hindsight, some Coast Guard responders thought that their initial approach was too slow and unfocused.[29]

It is impossible to separate an evaluation of the speed with which the response progressed in its early days from the misunderstanding of the actual flow of the well. Responders insist that they were responding to a worst-case discharge and would have not acted differently had they known the true flow rate earlier on. They uniformly reported that long-held Coast Guard policy was to assume the worst-case discharge. They said they did not believe the flow-rate estimates they were hearing and assumed the worst. However, it is possible that a better understanding of the quantity of oil may have resulted in designating a National Incident Commander faster, beginning to move personnel and resources faster, and establishing more and better communications with affected stakeholders earlier on. The early BP estimate that the riser was leaking 1,000 barrels per day lasted until April 28, 2010, when NOAA scientists produced an estimate of 5,000 barrels per day.[30] It was only after this five-fold escalation in the flow-rate estimate that the NIC structure was added to the spill response framework.

Though the response may have been slow to escalate in the first ten days, by at least mid-May, 2010, the Coast Guard was fighting a war against the oil. They built out the organizational structure for the response, and they moved resources into the area from all over the country.[31] To accomplish these tasks they needed more personnel. The spill happened at precisely the worst time for the Coast Guard, at the beginning of transfer season, when members are reassigned to new posts.[32] People were moving around and required new training. Coast Guard officials wanted to call up reservists and National Guard members to supplement their active duty ranks. This was not without difficulty. Reservists can only be called up for a certain period of time, and officials had concerns that they would quickly deplete the reserve numbers, especially if the spill lasted into the fall. High-level Coast Guard officials were also unsure of their authority to call on the National Guard, which required coordination with the states.[33] This maneuvering took time.

The majority of Coast Guard personnel interviewed insisted that they had thrown everything they had at the spill. By around the end of May, it seems that most responders believed they had the equipment they needed—they had skimmers, for example, that were adequate for the operating environment of the Gulf of Mexico, and they had enough of them. The American public, however, believed that the government could be doing more. When President Obama first visited the Gulf on May 3, 2010, the president of St. Bernard Parish in Louisiana was already suggesting that the government wasn't moving quickly enough.[34] A Pew research poll conducted from May 6 to 9, 2010, found that only 38% of Americans approved of

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[29] Interviews with Coast Guard officials.

[30] Press conference, Admiral May Landry, United States Coast Guard, Federal On-Scene Coordinator, in New Orleans, LA (Apr. 28, 2010), http://cgvi.uscg.mil/media/main.php?g2_itemId=843309.

[31] Coast Guard documents.

[32] Interviews with Coast Guard officials.

[33] Interviews with Coast Guard officials. The National Guard in a state can be mobilized by the governor when a state of emergency is declared, and the Secretary of Defense can call on the National Guard during war or a during declared national emergency. National Guard members cannot be individually involuntarily recalled. United States Code Title 32 describes state use of the National Guard in peacetime, while Title 10 establishes the federal government's authority to call on the National Guard. 32 U.S.C. § 101 *et seq.*; 10 U.S.C. § 12301. There was some debate as to the applicable statutory authority.

[34] Robin Bravender, *Gulf Coast Residents Send SOS to Obama*, N.Y. TIMES (May 3, 2010).

the President's handling of the spill, compared to 36% who disapproved.[35] By May 27, 2010, polls showed that 60% of adults thought that the government was doing a poor job of responding to the spill.[36]

The government did not take any major steps to respond to this perception until the end of May, when President Obama announced that he would triple the federal manpower and resources responding to the spill.[37] Coast Guard responders believed they were already throwing every resource they had at fighting the spill, but they dutifully tripled everything—number of people, number of feet of boom, number of skimmers and tracked their progress, at least for the state of Louisiana, in a regular report titled "Status of Tripling."[38] Responders noted that "tripling" taxed the Coast Guard's ability to respond and to conduct its other missions and may not have been the most effective use of a thin-spread force in a lengthy campaign.[39] Tripling, or at least the arguable overreaction to the public perception of a slow response, resulted in resources being thrown at the spill in general rather than being targeted in an efficient way. For example, NIC staff believed they needed to buy every skimmer they could find, even though they were hearing that responders on the ground had enough skimmers.[40] It was also around this time that responders began deploying boom everywhere they could, even though they believed that some areas were not likely to encounter oil and boom could be more efficiently directed elsewhere (discussed in greater depth in "The Boom Wars" section below). It is not clear whether all resources in all states were actually tripled or merely increased. At the very least, tracking the "status of tripling" was probably not the most important information for front-line responders to be collecting.

Adding personnel also meant using resources that the Coast Guard believed they needed to keep elsewhere or save for a potentially long campaign. This particularly applied to reservists. Coast Guard reservists can be recalled for sixty-day periods, after which they cannot be recalled for two more years.[41] NIC staff were concerned that they would deplete available reserves for the next two years.[42] In July 2010, before the well was capped, NIC staff began to approach other agencies to determine if they could send additional responders. Some agencies, such as EPA and NOAA, were already moving people from their home missions and sending them to the Gulf. Other agencies, such as the Department of Defense, did not have a strong presence and were willing to send some people to assist. The well was capped and the point became moot before the NIC had to implement this strategy.

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[35] SURVEY REPORT, THE PEW RESEARCH CENTER FOR THE PEOPLE AND THE PRESS, OIL SPILL SEEN AS ECOLOGICAL DISASTER; GOVERNMENT, BP RESPONSES FAULTED (May 1, 2010), http://people-press.org/report/612/oil-spill.

[36] Mimi Hall, et al., *Is oil spill becoming Obama's Katrina?*, USA TODAY (May 27, 2010), http://www.usatoday.com/news/washington/2010-05-27-Spill-poll_N.htm (reporting results of USA Today/Gallup poll).

[37] *See, e.g.*, *Obama Pledges to Triple Oil Response Manpower in Gulf*, BBC NEWS (May 28, 2010), http://www.bbc.co.uk/news/10179369; Paul Rioux, *President Barack Obama Promises No Retreat from Gulf of Mexico Oil Spill Response*, TIMES-PICAYUNE (May 28, 2010).

[38] Interview with Coast Guard official.

[39] Interview with Coast Guard official.

[40] Interview with Coast Guard official.

[41] 14 U.S.C. § 712.

[42] Interview with Coast Guard official.

C. Decision-Making Outside the Command Structure

As discussed above, the Deepwater Horizon spill was the first time a spill of national significance was declared and a National Incident Commander was named. The spill was also unprecedented in terms of size and the technology required to address it. As a result of these factors, and of the intense political interest in the spill response, decision-making structures outside the unified command, and thus outside the regulatory framework of the NCP, evolved.

The NCP envisions the Coast Guard as the lead agency for oil spill response, anticipating that it will provide the Federal On-Scene Coordinator and a large percentage of the responders. Other agency partners, however, have roles under the NCP as well. The National Response Team and the Regional Response Team are established inter-agency and inter-jurisdictional partnerships that can be convened in an emergency to make decisions and to utilize each agency's expertise. The Regional Response Team is activated when a spill exceeds the response capability of the Federal On-Scene Coordinator, transects state boundaries, poses a substantial threat to public health, or involves a worst-case discharge. Similarly, the National Response Team is activated when a spill exceeds the response capability of the region in which it occurs, transects regional boundaries, or involves a substantial threat to public health.[43]

During the Deepwater Horizon response, these inter-agency groups were activated but later marginalized when issues were taken out of their hands and decided by agency heads rather than through the established decision-making structure. When the first National Response Team conference call was held, instead of the designated team members, the principals of the agencies were on the line and Secretary of Homeland Security Janet Napolitano chaired the call. The principals or their deputies remained very involved in the response and took over addressing key issues. While this was valuable in showing how seriously the government was taking the spill and the response, it also injected political involvement of the highest levels. Such involvement may have increased accountability, and helped to make controversial decision-making more transparent, but it also made the decisions more subject to criticism and delay on political grounds.

For example, the NCP provides that the Regional Response Team shall make decisions on the use of dispersants. During the earliest days of the response, acting Federal On-Scene Coordinator Captain Paradis directed the application of surface dispersants, as pre-approved in the Area Contingency Plan.[44] Sub-sea application was a novel use, and Coast Guard officials sought permission from the Regional Response Team, which elected to allow tests of the technique.[45] As the issue of dispersant application became more and more prominent in the media and correspondingly more politicized, the decisions to apply both surface and sub-sea dispersants were taken out of hands of the Federal On-Scene Coordinator and the Regional Response Team and given to EPA Administrator Jackson.[46] Administrator Jackson elected to bypass the Regional Response Team structure and instead issue decisions regarding dispersant policy through directives, which Coast Guard representatives co-signed.[47]

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[43] 40 C.F.R. § 300.110.
[44] Interviews with Coast Guard officials.
[45] Interview with Coast Guard official.
[46] The use of dispersants is the subject of a separate Commission draft staff working paper.
[47] Interviews with Coast Guard officials.

As explained by a senior official, the National Response Team and the Regional Response Team became "report-to" bodies rather than "decision-making" bodies.[48] This circumvention of the NCP structure made it unclear to the public and to responders who actually had authority over decisions on important issues such as dispersants. Responders, who often viewed surface dispersants as a powerful response tool that they needed to deploy to protect the coastline, and who understood the analysis that went into the decisions to pre-approve use of surface dispersants during the planning process, wondered why that advance planning work was suddenly being supplanted by what appeared to be a political process.

On the one hand, it speaks well of the command structure and the NCP that the structure could be flexible enough to incorporate new interagency partnerships and new decision-making structures. On the other hand, the seeming rejection of the interagency groups specifically established by the NCP speaks to a larger issue of the failure of planning documents to adequately assist responders in preparing for a spill of this magnitude. The National Response Team and the Regional Response Teams are institutional structures with designated membership and responsibilities before a spill occurs. They are organizations that can plan, train, and generally be ready to respond in an emergency. It is not yet clear if the choices to route decision-making around those bodies were based on politics or the exigencies of the situation. Much of the unified command structure is designed to push issues down to the most local level at which they can be addressed. Having such strong agency head participation tended to elevate decisions that might have otherwise been addressed closer to the source of the question.

The scientific advisor agencies—EPA, the National Oceanic and Atmospheric Agency (NOAA), and the United States Geological Survey—seem to have been those possessing expertise most implicated by the spill and therefore also the agencies most involved in ad hoc decision-making taking place outside the command structure. In addition to the issue of dispersants, this ad hoc decision-making occurred with regard to fishery closures and flow rate estimates. NOAA, the United States Department of Agriculture, and the NIC-created Interagency Solutions Group were in control of fishery closures. The Flow Rate Technical Group, also a part of the Interagency Solutions Group, and the federal scientific team led by Secretary of Energy Steven Chu spoke for the government on flow rate. These issues, and the decision-making structures that were created to address them, will be explored more fully in other staff working papers.

In contrast with the National Response Team and the Regional Response Team, the Department of Energy took on a large role during the spill. The NCP does not create any sort of role for the Department of Energy in an oil spill response, and yet the Department of Energy team was integral in the steps to contain the well, eventually directing and exercising veto power over BP's actions with regard to source control. Because the DOE team was focused on containment rather than response, the role of the Department of Energy will be explored in greater detail in a subsequent paper on containment.

Problems with setting up the command structure quickly enough, and with making lines of authority clear, arguably contributed to problems explored in the next two sections: public perceptions that BP was in charge and that state and local concerns were being ignored.

[48] Interview with Coast Guard official.

Suggestions for the Commission's consideration:

- The response structure was established more slowly than it should have been, in part because of a perception that the well would be quickly controlled.
- The National Response Team and the Regional Response Teams did not play the role envisioned by the NCP, with substitute, ad hoc structures being created in their place. The Commission may wish to recommend changes to the mission or composition of the National Response Team and the Regional Response Teams to make them more useful in the future, particularly in creating a framework to provide interagency scientific expertise.

III. The Role of BP

Very early in the response, the media and the public began to question whether the federal government or BP was truly directing the response. While all on-scene government officials with whom we have spoken have asserted that the federal government was fully in charge of the response from the outset, the government struggled to control messaging regarding who was directing containment and response efforts.

A. The Role of the Responsible Party under the Oil Pollution Act

For oil spills from offshore rigs, the NCP defines the "lessee or permittee of the area in which the facility is located" as the "responsible party." Under the Oil Pollution Act framework, a responsible party will be liable for damages resulting from the oil spill and costs incurred by the government in responding to the spill.[49]

The NCP does not sort out these liability issues—it is a structure for response, not a vehicle for assigning blame. However, the NCP does direct that the responsible party play a role in the response. One of the principles of the unified command structure the NCP establishes is that the responsible party must be included in order to "achieve an effective and efficient response."[50]

The NCP provides that "cleanup responsibility for an oil discharge immediately falls on the responsible party," and notes that "in a large percentage of oil discharges, the responsible party shall conduct the cleanup."[51] Though the NCP directs the Federal On-Scene Coordinator to "monitor[] or direct[] all federal, state, local, and private removal actions," the Federal On-Scene Coordinator may "allow the responsible party to voluntarily and promptly perform removal actions" if the [Federal On-Scene Coordinator] determines that having the responsible party perform such actions will "ensure an effective and immediate removal of the discharge." In this situation, the Federal On-Scene Coordinator supervises the responsible party's actions. The NCP expresses a preference for setting up the response in this manner—"[w]here practicable, continuing efforts should be made to encourage response by responsible parties."[52]

[49] OPA 90 § 1002(b)(2); 33 U.S.C. § 2702.
[50] 40 C.F.R. § 300.105.
[51] 40 C.F.R. Part 300, Appendix E § 2.3(b).
[52] 40 F.C.R. § 300.305.

In a spill that "results in a substantial threat to the public health or welfare of the United States...the [Federal On-Scene Coordinator] must direct all response efforts."[53]

There are policy choices behind this preference. First, the responsible party may be in the best position to respond because of its knowledge or technical expertise related to the processes involved in its own facility. Second, the responsible party bears the ultimate costs of removal under the Oil Pollution Act.[54] Rather than expending further resources on collecting response costs in a later civil action, it is more efficient to let the responsible party bear those costs up front.

In an ongoing spill, the interests of the responsible party and the public are often aligned while the oil is flowing. Under the Clean Water Act, the responsible party can be liable for a civil penalty determined by the amount of oil that was spilled, so it shares the public's interest in cutting off the oil flow as quickly as possible.[55] On other issues, the incentives of the public and the responsible party may diverge. For instance, the responsible party may, at least in theory, have an interest in using dispersants even if they cause ecological harm. Environmental damage caused by low concentrations of widely dispersed oil may be harder to document than concentrated surface harm in coastal areas. Moreover, public opinion may be more likely to be influenced by easily visible harm to wetlands, beaches, birds, and terrestrial animals. Hence, the responsible party may have an incentive to favor greater use of dispersants than is in the public interest. Similarly, the public may have an interest in knowing the rate of flow from the well, while the responsible party may benefit from obfuscating or underestimating the rate of flow because high flow means higher liability.[56] Moreover, a responsible party has a fiduciary duty to its shareholders to minimize costs incurred. This fiduciary duty can be at odds with the public's interest in maximizing cleanup efforts.

The Oil Pollution Act does not address the responsible party's ability to "conduct" the cleanup by issue, though it does mandate stronger authority for the government in a catastrophic spill, where the Federal On-Scene Coordinator "directs" the response. Similarly, although the Oil Pollution Act requires that operators name a "qualified individual" who has full authority to implement removal actions," the Act is silent about circumstances where that individual's responsibility for cleanup conflicts with her duties to the shareholder as a corporate officer.[57] One possibility that has been suggested, which staff has not yet considered fully, might be to provide for appointment of a "qualified individual" under the Oil Pollution Act that is an independent third party, rather than a corporate officer, with authority to deploy the responsible party's resources. Such an arrangement might be akin to the compensation scheme set up by BP in the wake of the Deepwater Horizon spill, with corporate funds disbursed by an independent administrator.

B. BP's Control in the Command Structure

During the Deepwater Horizon response, BP had decision-makers in multiple locations within the command structure. The Incident Command Post at Houston was set up in BP

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[53] *Id.*
[54] 33 U.S.C. § 2702.
[55] 33 U.S.C. § 1321(b)(7).
[56] 33 U.S.C. § 1321(b)(7)(A) (establishing civil liability for spills in the amount of $25,000 per day or $1,000 per barrel spilled); 33 U.S.C. § 1321(b)(7)(D) (raising the penalty to $3,000 per barrel of oil in cases of gross negligence or willful misconduct).
[57] 33 U.S.C. § 1321(j)(5)(D)(ii).

headquarters. In the Unified Area Command at Houma, most Coast Guard responder positions had a BP counterpart, and Coast Guard members and BP employees worked side by side. BP executive Doug Suttles was at Unified Area Command at Houma. Federal On-Scene Coordinator Watson viewed Suttles as his counterpart and the set-up as similar to that of other spill responses he had handled in the past. The organizational charts from the Unified Area Command and the Incident Command Posts show BP employees scattered through the command structure, in roles ranging from waste management to environmental assessment. In some command chains, a BP employee was at the top and a Coast Guard member would report up to the BP employee.[58]

Most critically, BP controlled access to the wellhead at all times from Houston. BP had control of the remotely operated vehicles (ROVs) operating 5,000 feet below the surface of the water at the riser pipe and wellhead, as well as control of all vessel traffic in the area above. BP used ROVs to coordinate nearly every element of the containment response, including gathering data, carrying out mechanical containment procedures, and applying subsea dispersant.[59]

In its *Lessons Learned* report, BP details the complexity of coordinating its response to the spill.[60] BP's Simultaneous Operations unit managed ships moving in and out of the area. There may have been good reasons for BP's control of this issue. Too much traffic over the wellhead was dangerous, particularly when large unknown containment efforts such as the cofferdam were being tested.[61] Also, some of the operations that the containment ships carried out required extreme precision—movement by even a few feet could lead to failure of the operation.

BP's control over the wellhead region, however, also limited scientists' access. As government and independent scientists began to become involved with determining the flow rate of the well and with developing containment solutions, some grew frustrated with what they perceived was BP's total control over access to the source, and ultimately information about the leaking well.[62] The federal science team in Houston may have had better access to information from BP than independent scientists, however. According to scientists with whom Commission staff has spoken, they all needed some sort of access to the source—either to take pictures with an ROV, or to take source samples, or to obtain some other source data for determining flow rate. Given that its potential liability under the Clean Water Act depended directly on the flow rate, BP had real incentives to maintain exclusive control over the ability to estimate that rate.

C. BP's Role on Containment

The containment effort will be discussed in greater detail in a later staff working paper. The following section is intended only to provide preliminary information relevant to the role of BP in the overall response.

BP assembled a team to work on containment issues and took the lead on early containment efforts.[63] BP used ROVs in the first days of the leak to attempt to manually shut off

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[58] Coast Guard documents.

[59] BP, DEEPWATER HORIZON CONTAINMENT AND RESPONSE: HARNESSING CAPABILITIES AND LESSONS LEARNED 15-16 (Sept. 1, 2010) [hereinafter LESSONS LEARNED].

[60] LESSONS LEARNED

[61] *See* Clifford Krauss et al., *Acrimony Behind the Scenes of Gulf Oil Spill*, N.Y. TIMES (Aug. 26, 2010).

[62] Interview with non-governmental officials.

[63] The decision-making processes with regard to containment will be discussed more fully in a later draft staff working paper.

the leaking pipe. The company next tried the "top kill" method of plugging the well with heavy drilling mud, coupled with the "junk shot" technique of filling the valves of the failed blowout preventer with debris. When these attempts failed, BP developed a large "cofferdam," which it planned to place over the leaking well.[64] This attempt failed due to the buildup of hydrates in the high-pressure, low-temperature environment.[65] Focus then shifted to collection of the oil, rather than stopping flow from the well, and BP employed a miniature cofferdam known as the "top hat" to recover a fraction of the leaking oil and gas. On July 15, 2010, mud injected down into the well was able to overcome the pressures of the reservoir below and finally stop the flow of oil.[66] BP had been drilling two relief wells to intersect the Macondo well to seal the reservoir. The Macondo well was finally declared dead on Sunday, September 19, 2010.[67]

High-level government officials asserted that they were in charge from the beginning, and the Coast Guard (through the Federal On-Scene Coordinator and later through the National Incident Commander) in theory approved all of BP's actions. In hindsight, though, some Coast Guard responders indicated that they had functioned more as observers than as participants in BP's very early containment efforts, with one observing that BP was permitted to try to activate the failed blowout preventer for five days before efforts started in earnest on the containment dome.[68] The Unified Area Command was briefed every day, but the information was insufficient in quantity and level of detail.[69] Because the Coast Guard's response mission deals predominantly with capturing and cleaning oil on the surface of the water—not 5,000 feet below the surface—the Coast Guard had limited ability to contribute expertise to the challenge of controlling the well.[70]

Though the Coast Guard may have not been highly involved with containment efforts, it was not the only government agency contributing to the containment efforts after the first few days, though it had (again, at least in theory) final approval authority for all actions. Deputy Secretary of the Interior David Hayes became involved in response efforts early on.[71] Near the end of the first ten days, the White House asked the Department of Energy National Laboratories to participate in the containment efforts. Secretary of Energy Steven Chu, a Nobel Prize-winning physicist, went to BP headquarters in Houston, along with other scientists from the National Laboratories.[72]

The participation of the federal science team in early containment efforts was limited, and they were unclear on their role. Before the failed cofferdam attempt, the federal science team

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[64] Clifford Krauss et al., *Acrimony Behind the Scenes of Gulf Oil Spill.*

[65] *Id.*

[66] Campbell Robertson & Henry Fountain, *BP Says Oil Flow has Stopped as Cap is Tested*, N.Y. TIMES (July 15, 2010).

[67] Henry Fountain, *U.S. Says BP Well is Finally Dead*, N.Y. TIMES (Sept. 19, 2010).

[68] Interview with Coast Guard official.

[69] Interview with Coast Guard official.

[70] *Oil Spill Response Technician Course*, U.S. COAST GUARD, http://www.uscg.mil/hq/nsfweb/nsfcc/ops/LogisticsInventory/osrt.asp (Coast Guard training program for oil spill responders).

[71] Deputy Secretary Hayes went to the Gulf the morning of April 21, 2010. The White House Blog, The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill, http://www.whitehouse.gov/blog/2010/05/05/ongoing-administration-wide-response-deepwater-bp-oil-spill.

[72] *See* John M. Broder, *Energy Secretary Emerges to Take a Commanding Role in Effort to Corral Well*, N.Y. TIMES (July 16, 2010).

was assisting in diagnostics and general testing, but was not playing an authoritative role.[73] As the scientists became more familiar with the situation, and as it became clear that BP's containment efforts were not working, the team's role became more comprehensive.

At some point in late May or early June, 2010, around the same time as the "tripling" directive, the White House, through the National Incident Commander, requested more engagement in source control by the federal science team. The team began to play a larger part in decision-making.[74] BP began working on containment action plans with the federal science team for approval before sending them to Admiral Allen for permission to take action.[75]

Despite their eventually active role, neither the Department of Energy in general, nor Secretary Chu and his scientific team, were functioning within the NCP structure. When responders looked around in the government for specific expertise on well blow-outs, including in the military and in the scientific agencies, they found little to none. The oil and gas industry is the main source of expertise in dealing with blow-outs, and the government eventually turned to experts from other companies as a result.[76]

Later staff work will consider the question of whether BP's leadership made the source control and response efforts any less effective than they could otherwise have been. While this paper does not answer that question, it is plain that BP's leadership role affected public perception of who was in charge. Much of the public, watching the ROV video of oil gushing from the ground, was focused on the effort to stop and contain the flow of oil from the well, over which BP exercised far more actual control than it did over spill cleanup and response.

D. Public Perception of Control

At the beginning of the spill, BP and the government would hold joint press conferences. This was consistent with the Coast Guard view—shaped by its experience implementing the NCP under a unified command system—of the responsible party as a co-combatant in the fight against the oil. This was not a view shared by either large segments of the public or by high-ranking officials in other government agencies, who viewed the relationship as a far more adversarial one. On April 29, 2010, at a press conference involving senior Administration officials such as Carol Browner, Assistant to the President for Energy and Climate Change; Administrator Jackson; Deputy Secretary Hayes, and Secretary Napolitano, Coast Guard Rear Admiral Sally Brice O'Hara referred to BP as "our partner," prompting Secretary Napolitano to quickly correct the record, saying, "They are not our partner!"[77] Secretary of the Interior Ken Salazar said the government would keep its "boot on the neck" of BP.[78] These statements

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[73] *See, e.g.*, Joshua Green, *Exclusive: How Steven Chu Used Gamma Rays to Save the Planet*, THE ATLANTIC (May 13, 2010), http://www.theatlantic.com/technology/archive/2010/05/exclusive-how-steven-chu-used-gamma-rays-to-save-the-planet/56685/ (transcribing an interview with Secretary Chu, who noted that BP was "taking the lead" but to "the extent BP wants it, we can give advice on how to think through" various options).

[74] *See* Broder, *Energy Secretary Emerges to Take a Commanding Role in Effort to Corral Well*; The Ongoing Administration-Wide Response to the Deepwater Horizon BP Oil Spill, RESTORE THE GULF (MAY 28, 2010), http://app.restorethegulf.gov/go/doc/2931/573235/.

[75] Coast Guard documents.

[76] Interview with government official.

[77] Tim Dickinson, *The Spill, the Scandal, and the President*, ROLLING STONE (June 24, 2010).

[78] *See, e.g.*, Matthew Bigg, *U.S. keeps "boot on neck" of BP over spill*, REUTERS (May 24, 2010), http://www.reuters.com/article/idUSTRE6430AR20100524; Frank James, *BP Will Feel Either 'Boot on Throat' or 'Feet to Fire'*, NPR THE TWO-WAY NEWS BLOG (May 2, 1010), http://www.npr.org/blogs/thetwo-way/2010/05/bp_will_feel_either_boot_on_th.html.

seemed to have a two-fold purpose—to provide reassurance that BP would be held accountable and to show that government was in control of BP and the situation. With the majority of the country believing that the government had lost control and was managing the response badly, the joint press conferences with BP stopped, and Admiral Allen instead began holding a solo daily press briefing.[79]

When Rear Admiral James Watson took over as Federal On-Scene Coordinator on June 1, 2010, at around the time of the "tripling" announcement, he contributed to the move to a stronger and more visible federal presence. On June 8, 2010, Admiral Watson directed BP to "establish system(s) capable of safely collecting the oil and gas flowing" from the well and to provide a plan for doing so in 72 hours.[80] Though this directive related to source control, the intent was to increase the participation and visibility of the government in the response.[81]

Another factor that may have affected the public perception of control was the number of front-line responders from the federal government versus the number of front-line responders either employed directly by BP or employed through a BP subcontractor or oil spill response operator. The responders that local citizens saw operating skimming vessels, picking up tarballs, or deploying boom were private hired workers and not Coast Guard or other government personnel.[82] BP was providing the money and a large part of the equipment, and BP was providing the contractors and response personnel out on the beaches.

E. Funding Projects Outside the Unified Command

BP may have heightened the perception that it was running the show by distributing money for response costs directly to state and local governments. There is a procedure in the NCP by which state governments can seek up to $250,000 from the Oil Spill Liability Trust Fund for removal costs.[83] The Federal On-Scene Coordinator must approve and then manage the request, which must comply with the NCP.[84]

Funds started flowing from BP to states and communities early in the response. On May 5, 2010, BP gave $25 million each to Florida, Alabama, Mississippi, and Louisiana to "accelerate the implementation of Area Contingency Plans."[85] Two weeks later, BP gave Louisiana another $25 million and the other three states $15 million each to promote tourism. These sums, provided completely outside of the unified command structure and without any requirement that the monies be used in a manner consistent with the NCP, gave states and communities reason to believe that BP controlled the means and the methods of the response. This money may have had a detrimental effect on the response efforts overall. For example, some of the money was spent by states and parishes to purchase boom directly, limiting the

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[79] Mike Allen, *Gulf commander to begin solo briefings*, POLITICO (May 31, 2010), http://www.politico.com/news/stories/0510/37965.html.

[80] Letter from Admiral James A. Watson, Federal On-Scene Coordinator, United States Coast Guard, to Doug Suttles, Chief Operating Officer, Exploration & Production, BP America Inc. (June 8, 2010), *available at* http://www.deepwaterhorizonresponse.com/external/content/document/2931/621367/1/FOSC%20letter%20to%20BP%202008%20June%20Final.pdf.

[81] Interview with Coast Guard official.

[82] Private oil spill response operators turned out in force for skimming and shoreline cleanup efforts. Jia Lynn Yang, *Aftermath spawning profits for many contractors*, WASH. POST (June 12, 2010).

[83] 40 C.F.R. Part 133.

[84] 40 C.F.R. §§ 133.13, 133.15.

[85] Press Release, BP, BP Announces Tourism Grants to Four Gulf States (May 17, 2010), *available at* http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7062187.

overall supply of boom available to the unified command and making it difficult for the unified command to make sure that the boom got to locations where it would be most helpful and not cause any additional environmental damage.[86]

F. Appropriate Role of a Responsible Party

At a political level, there is a fundamental tension in the government working with the party responsible for the disaster, but at the responder level it was necessary to work together to have the means to stop the spill. Admiral Allen referred to the public's resistance to having BP play a role in the response as the social or political nullification of the NCP.[87] The Commission may wish to consider making recommendations regarding the proper role of the responsible party and the proper way to communicate that role in the context of a major response effort.

Specifically, three issues deserve mention. First, the oil and gas industry has significant expertise that the federal government lacks, so the responsible party can and likely must play a substantial role in containment and response efforts. Second, the government may need to consider the extent to which the interests of the public and the interest of the responsible party in minimizing liability diverge with respect to particular issues, and to consider more detailed oversight on issues where divergence is more likely. For example, because the volume of oil released directly affected BP's liability under the Clean Water Act, the government may have had particular reason to have its own or independent scientists determine the flow rate rather than relying on estimates created by scientists employed by the responsible party. Third and finally, the governmental response needs to be explained to the public: the fact that a responsible party continues to assist with containment and cleanup does not mean that the government will not also hold them responsible via mechanisms like the Clear Water Act. Continuing to work closely with the responsible party while clarifying the nature and extent of government oversight would likely require significant effort by all governmental entities involved, but it is crucial to maintaining public confidence in the containment and response efforts.

Suggestions for the Commission's consideration:

- Consider the identification of issues with respect to which the responsible party may have greater operational expertise, such as source control, from issues with respect to which the government possesses equivalent operational expertise, such as other types of response. Consider clarifying the extent and nature of government oversight with respect to different classes of issues, including issues where the responsible party's interests in minimizing liability and the interests of the public may be more likely to diverge.
- Clarify the role of the responsible party for both the public and for other agencies when operating within the NCP structure

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[86] This problem is one the Joint Industry Task Force observed in its evaluation of the spill response. The Task Force recommended that government "establish clear-well understood protocols to discourage shoreline protection and cleanup response operations outside scope of [unified command] planning, review, and direction." JOINT INDUSTRY OIL SPILL PREPAREDNESS AND RESPONSE TASK FORCE, DRAFT INDUSTRY RECOMMENDATIONS TO IMPROVE OIL SPILL PREPAREDNESS AND RESPONSE viii (Sept. 3, 2010).

[87] Interview by Melissa Block, NPR with Adm. Thad Allen, (Aug. 5, 2010), http://www.npr.org/templates/transcript/transcript.php?storyId=129005047. *See also* Joel Achenbach, *With BP's Know-How and U.S. Authority, the Macondo Well was Plugged*, WASH. POST (Aug. 21, 2010).

IV. The Role of State and Local Governments

Significant differences of opinion existed between the affected states and the federal responders regarding each other's role and appropriate response tactics. Federal responders were employing the NCP, a response structure with which state and local governments were unfamiliar and in which they were not highly involved. That unfamiliarity led to conflicts that hampered the response. The Commission may want to consider recommendations that increase awareness of the NCP on the part of state governments and that alter spill response contingency planning to expand the role of existing state and local emergency response structures.

A. The Stafford Act

State and local officials, and perhaps particularly those in the hurricane-stricken Gulf states, are familiar with the Robert T. Stafford Disaster Relief and Emergency Assistance Act.[88] The Stafford Act describes how the federal government may provide aid to an overwhelmed state during an emergency.[89] The organizing principle of the Act is the funding and coordinating, not directing or controlling, role of the federal government.

When a governor determines that local and state resources are insufficient to handle an emergency response, the governor may ask the President to contribute federal aid pursuant to the Stafford Act by declaring an emergency or major disaster.[90] When requesting such a declaration a governor must describe what the state will do to implement its emergency response plan and detail the type and extent of federal assistance needed. The Act broadly defines an emergency as any instance where federal assistance is needed to supplement state efforts to avert a catastrophe, or to save lives and protect property, health, and safety. Specific forms of aid the government may provide during an emergency are: to direct federal agencies to use their resources to *support* state and local efforts;[91] to coordinate all disaster relief *assistance* provided by Federal agencies, private organizations, and State and local governments,[92] and; to *assist* State and local governments in the distribution of medicine, food, and other consumable supplies.[93] The emphasized terms indicate that Congress intended a supportive, not a preeminent role for the federal responders.[94] The Federal Emergency Management Agency (FEMA) administers the bulk of the aid provided under the Stafford Act.[95] The Administrator of FEMA appoints a

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[88] *See* 42 U.S.C. §§ 5121-5206; 44 C.F.R. §§ 206.1-206.440.

[89] *See* Ross C. Paolino, *Is it Safe to Chevron "Two-Step" in a Hurricane? A Critical Examination of how Expanding the Government's Role in Disaster Relief Will Only Exacerbate the Damage*, 76 GEO WASH. L. REV. 1392, 1394 (2008).

[90] *See* 42 U.S.C. § 5170 (major disaster); § 5191 (emergency).

[91] *See* 42 U.S.C. § 5192(a)(1).

[92] *See* 42 U.S.C. § 5192(a)(2).

[93] *See* 42 U.S.C. § 5192(a)(7).

[94] *See* 42 U.S.C. § 5192(a)(2) provides that the President may "coordinate all disaster relief assistance (including voluntary assistance) provided by Federal agencies, private organizations, *and State and local governments*" (emphasis added). This could be read as granting the President the authority to coordinate the entire response. In light of the clearly supportive role for federal responders evinced throughout the Act, this provision probably grants authority to coordinate assistance from other state governments.

[95] *See* 44 C.F.R. § 206.1; *see also* 44 C.F.R. § 206.62 (delegating emergency response authority to the Administrator of FEMA). The Administrator of FEMA serves as the chairperson of the interagency task force created by the president to coordinating the implementation of pre-disaster hazard mitigation programs. *See* 42 U.S.C. § 5134 (2006).

federal coordinating officer tasked with appraising the types of relief most needed, establishing field offices, coordinating the administration of relief among organizations that agree to operate under his direction, and taking any other action necessary to assist citizens and officials.[96] For example, the Stafford Act was invoked during Hurricane Katrina to provide aid to the same states affected by the Deepwater Horizon spill. Governors of the Gulf States requested and received declarations of emergency and major disaster. Admiral Allen was named the Principal Federal Officer in that situation, and his role was to provide federal resources and coordinate state responders, not to actually direct the response.[97]

B. Oil Spill Response Under the NCP

The NCP provides a fundamentally different role for the federal government. Instead of a state-run response supplemented with federal resources and finances, the NCP demands that the federal government direct the response through a federal On-Scene Coordinator with the participation of the state through the Unified Command structure. The state then provides a State On-Scene Coordinator to represent the state at the Unified Command, and also provides personnel to implement the response decisions reached by the Federal On-Scene Coordinator or the unified command. Because states and local governments cannot spend funds from the oil spill liability trust fund without an authorization agreement from the Federal On-Scene Coordinator, they are limited in their ability to respond as they would like to the threat of encroaching oil.

State and local officials were unfamiliar with this structure and were uncomfortable with a federally directed response. Whether the cause was political demands, concern that the federal government was ineffective, or genuine confusion about the applicable legal framework, state and local officials closest to the affected areas complained that they were shut out from decision-making, as described in the next section on the boom conflict. Meanwhile, federal responders reported their feeling that the message they were hearing from the state was "give us the money and go away."[98]

This unfamiliarity and discomfort with the federal response manifested itself in competing state structures, which undercut the efficiency of response efforts. This was particularly true in Louisiana. Governor Jindal's advisors reportedly spent days determining whether the Stafford Act or the NCP applied.[99] Louisiana declared a State of Emergency on April 29, 2010 authorizing the director of the Governor's Office of Homeland Security and

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[96] *See* 42 U.S.C. § 5143; 44 C.F.R. § 206.41. The federal coordinating officer also leads the emergency support and response teams. *See* 42 U.S.C. § 5144.

[97] The use of the Stafford Act during Hurricane Katrina response and the role of the federal government within the response was not without notable problems. *See* SELECT BIPARTISAN COMMITTEE TO INVESTIGATE THE PREPARATION FOR AND RESPONSE TO HURRICANE KATRINA, 109TH CONG., A FAILURE OF INITIATIVE: FINAL REPORT OF THE SELECT BIPARTISAN COMMITTEE TO INVESTIGATE THE PREPARATION FOR AND RESPONSE TO HURRICANE KATRINA, U.S. HOUSE OF REPRESENTATIVES 146 (Comm. Rep. 2006) *available at* http://katrina.house.gov/. Some critics felt that the federalism concerns embodied in the Stafford Act system contributed to the slow response. *See* Stephen M. Griffin, *Stop Federalism Before it Kills Again: Reflections on Hurricane Katrina*, 21 ST. JOHN'S J. LEGAL COMMENT 527, 531-32 (2007).

[98] Interview with Coast Guard official.

[99] Interview with government official.

Emergency Preparedness to undertake any legal activities deemed necessary to respond.[100] Roland Guidry, the Louisiana Oil Spill Coordinator and the state's pre-designated State On-Scene Coordinator, had reported to the Unified Command when summoned at the beginning of the spill. However, he was removed from Unified Command after approximately 11 days and Governor Jindal named himself State On-Scene Coordinator.[101] No one else had the authority to speak for the state, so all decisions had to flow through the Governor's office, which slowed down decision-making and caused problems in the response efforts. Louisiana was not the only state where the governor stepped in and removed the designated State On-Scene Coordinator; all five Gulf state governors declared a state of emergency and became the State On-Scene Coordinator at some point in the response. However, based on interviews with Coast Guard and state personnel, the conflicts between federal responders and state government appear to have been most severe in Louisiana.

Federal responders improved their relationship with state and local officials as the response progressed. Senior Coast Guard officials were assigned to parishes in Louisiana and coastal counties in the other affected states to serve as liaisons.[102] Had this system been in place earlier, the relationship between the federal responders and local leaders may have been stronger and more productive in the early days of the spill response.

C. The Boom Wars

Boom became one of the most visible manifestations of state and local dissatisfaction with federal response efforts. Boom is a physical barrier between oil and water or shoreline. Ocean boom is placed in the water to try to keep oil in a contained area where it can then be skimmed or burned. Absorbent boom is placed along beaches or in marshes to absorb oil before it can enter and damage sensitive shoreline environments. Boom is a measurable, physical object that visibly stops oil from moving into areas to be protected. In this way it is different from source control efforts or skimming far out at sea—efforts that cannot be seen by residents in towns waiting for oil to hit.

In part for this reason, boom became a symbol of how responsive the government was to local communities.[103] Each state wanted the entire shoreline boomed, and each state wanted as much or more boom than the next state. This translated down to the parish and town levels as well. Federal responders thought that local people complaining about their lack of boom were missing the big picture; local people thought that federal responders weren't paying attention to local needs.[104] As a result, boom was eventually distributed according to political imperatives, not operational ones, in part because of distrust from state and local officials as to whether the federal government was adequately considering and addressing their needs during the response.

Responders were frustrated with the time they spent laying what was, in their view, unnecessary boom. The Area Contingency Plan does not lay out a specific booming map, as the marshy coastal ecosystem changes annually and any boom plan would be quickly out of date. Responders wanted to be able to direct the boom where they thought it most efficient and felt

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[100] Press Release, Office of the Governor, Governor Jindal Issues State Declaration of Emergency for Oil Leak (Apr. 29, 2010), *available at* http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&catID=2&articleID=2137&navID=3.

[101] Interview with government official.

[102] Interview with Coast Guard official; Coast Guard documents.

[103] Interview with Coast Guard official.

[104] Interview with Coast Guard official.

hampered by pressure to place boom everywhere. When the oiling risk was highest in Louisiana, the Coast Guard directed boom to Louisiana. They then heard complaints from the other states: Alabama Governor Bob Riley contended that the decision to move boom from the Alabama coast to the Louisiana cost left his shoreline in danger of oiling, and Mississippi and Alabama felt that they were being ignored as they had been during the Hurricane Katrina response.[105]

Governor Jindal in Louisiana said at a press conference in mid-May 2010 that the supplies, including containment boom, provided by the Coast Guard and BP were inadequate. At the same time, local officials held up pictures of oil-coated birds.[106] Governor Jindal said that he had requested 5 million feet of hard boom but had received only 786,185 feet, also referencing 143,000 feet of boom he said sat idle in staging areas.[107] Florida Department of Environmental Protection Secretary Mike Sole told reporters, "A lot of the decisions about Florida are being made in Mobile," by Admiral Landry and the Coast Guard-led command. "I told [Admiral Landry], 'Florida is important. We have 770 miles of shoreline to protect. I'm concerned that we're not getting enough focus on Florida.'"[108].

Local officials expressed similar views. Billy Nungesser, President of Plaquemines Parish, was a vocal critic of the response. President Nungesser deplored the lack of available boom, wanting enough material to create a second line of defense along the coast.[109] From the early days of the spill, he sought funds to enlist local fisherman to deploy boom and complained of the minimal boom that was available for use.[110]

The NIC was not deaf to these concerns. A directive went out to "keep the parishes happy," which resulted in operational decisions that may have been politically motivated.[111] Boom was placed everywhere, even where it was unlikely to encounter oil.

In addition to worries about unnecessary boom, responders had concerns about environmentally-damaging boom. Boom is not a perfect solution. For example, boom can harm environmentally sensitive areas such as marshes if severe weather conditions blow it around and onto delicate grasses and habitat. Responders were in a difficult position as they boomed places based on local pressures, pulled boom away during bad weather, and then put it out again.[112]

Once parishes had boom, they did not want to let it go. On July 22, 2010, President Nungesser, opposed the Coast Guard's decision to began removing boom in preparation for Hurricane Bonnie.[113] He threatened to slash the tires of trucks carrying away protective boom.

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[105] Holbrook Mohr, Justin Pritchard, Tamara Lush, *BP's gulf oil spill response plan lists the walrus as a local species. Louisiana Gov. Bobby Jindal is furious.*, CHRISTIAN SCIENCE MONITOR (June 9, 2010); Interview with Coast Guard official.

[106] Campbell Robertson, *Louisiana Officials Threaten Action is Spill Response Proves Inadequate*, N.Y. TIMES (May 23, 2010).

[107] David Hammer, *Frustration mounting over BP delays, lack of progress in Gulf of Mexico oil spill*, TIMES-PICAYUNE (May 23, 2010).

[108] Craig Pittman and Rebecca Catalanello, *BP plan to protect Florida from oil spill inadequate, officials say*, ST. PETERSBURG TIMES (May 3, 2010).

[109] Dan Murtaugh, *Gulf Coast Prepares Oil Defenses, Rallies Volunteers*, PRESS-REGISTER (April 30, 2010).

[110] *BP's Gulf oil spill response plans severely flawed*, ASSOCIATED PRESS (June 9, 2010), http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/06/bps_gulf_oil_spill_response_pl.html.

[111] Interviews with Coast Guard officials.

[112] Interview with Coast Guard official.

[113] "Oren Dorell, *Storm Forces Evacuation of Well Site BP Official Says Break Will be 10-12 Days After Federal Overseer Halts Gulf Work*, USA TODAY (July 23, 2010).

He later explained that his statement was only a joke.[114] Other parish presidents, either believing they had the authority or hoping to take that authority upon themselves, issued orders prohibiting response equipment from being moved out of the parish.[115] Coast Guard responders were threatened with arrest if they moved equipment.[116]

These problems were also a serious distraction that took time away from responders' ability to focus on the spill. For example, because state and local officials wanted to be able to evaluate the response on their own terms, they measured the "feet of boom deployed," a measurement that took time to compile but was of very little value in evaluating the effectiveness of response efforts.

The boom wars never reached a resolution. In many instances, responders knew that in deploying boom they were responding to the politics of the spill rather than the spill itself. They deployed boom along miles and miles of shoreline, and it was still not sufficient to prevent oil from washing up on the beaches.

D. Berms

Berms will be addressed in greater detail in a later staff working paper, and this short section is intended only to sketch the federal-state conflict over the issue. On May 8, 2010, President Nungesser and Governor Jindal proposed to build up the barrier islands along the Louisiana coast using dredges. President Nungesser argued that it would be much easier to clean up oil from the sand than from wetlands. He hoped that BP would fund the costly project and met with BP executives in the following days to discuss the proposition.[117] The state request was filed on May 11, 2010 and revised on May 14, 2010,[118] but the Army Corps of Engineers did not approve it immediately, fearing that even temporary berms would disrupt natural tidal flows.[119]

President Nungesser became very critical of the Army Corps' slow response, saying "we could have built 10 miles of sand boom already if [the feds] would have approved our permit when we originally requested it" and adding that "the federal government has got to move on this and BP has got to pay for it."[120] After President Nungesser's disappointment made national headlines on May 21, 2010, the Army Corps of Engineers issued emergency permits on May 27, 2010 authorizing one protective sand berm in the Plaquemines area.[121]

The tension surrounding the berm project reappeared a few weeks later when the federal government shut down the dredging activities on June 22, 2010, prompting President Nungesser to comment that "our government resource agencies, which are intended to protect us, are now

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[114] *See* Liz Robbins and Campbell Robertson, *Tension Among Officials Grows as Storm Nears*, N.Y. TIMES (July 23, 2010).

[115] *See id.*; Angel Gonzalez, *Locals to BP: Don't Leave Town Yet*, WALL STREET JOURNAL (Aug. 1, 2010); *St. Bernard Leader: Keep All Spill Equipment Here*, ASSOCIATED PRESS (July 30, 2010) http://www.wsfa.com/Global/story.asp?S=12902614; *Parishes Move to Block Movement of Oil Protection*, ASSOCIATED PRESS (July 22, 2010), http://www.klfy.com/Global/story.asp?S=12856658.

[116] Interview with Coast Guard official.

[117] Chris Kirkham, *Jindal, Nungesser Propose Building Barrier Islands, Dredges Could Shield Wetlands*, TIMES PICAYUNE (May 9, 2010).

[118] Chris Kirkham, *Sand barrier idea faces bureaucratic delays, ecological questions*, TIMES-PICAYUNE (May 21, 2010).

[119] Tim Padget, *Dredge, Baby, Dredge: Can Sand Stop the Oil?*, TIME MAGAZINE (June 1, 2010); James McKinley, *Experts Express Doubts on Sand-Berm Proposal*, N.Y. TIMES (May 22, 2010).

[120] Padget, *Dredge, Baby, Dredge: Can Sand Stop the Oil?*

[121] Schleifstein, *Sand berm to protect Barataria Bay wetlands gets federal OK*, TIMES-PICAYUNE (May 27, 2010).

leaving us vulnerable to the destruction of our coastline and marshes by the impending oil."[122] He evoked battlefield rhetoric, stating "we know we're getting ready to fight a war over there," and accusing the administration of limiting the tools for this fight.[123] A week later, the Army Corps of Engineers allowed berm building to resume after operations were shifted to a more distant site.[124]

E. Potential Problems with the NCP

In addition to the structural issue of differences between Stafford Act and the NCP, another factor at the root of the federal-state and federal-local conflicts was likely the failure of the contingency plans to adequately involve state and local officials. Coast Guard responders were very well connected to state responders such as the designated State On-Scene Coordinators, but not well connected with local officials or political officials at the state level.

a. State officials

Even though the various planning documents required by the NCP, including the Area Contingency Plans, had been signed by state officials, higher-level state officials did not appear to have participated in the planning process such that they understood what the plans called for. When confronted with a contingency plan, a state official reportedly told a Coast Guard responder, "I didn't sign that." In the opinion of the Coast Guard responder, the state official wasn't denying that his signature appeared on the document; he meant that no one had ever properly explained the content of plan to him.[125] When the time came to implement the plans as the State On-Scene Coordinator understood them, the governors largely rejected the plans and opted to run the response operations in a different way.[126] This set of circumstances at the state level may change as a result of this spill; we can expect that high-level state officials will now be more involved in contingency planning under the NCP. Though lesser spills had occurred in the region before, for many high-level officials, this was the first large-scale NCP response they had encountered. The Commission may also want to consider recommending that the Area Contingency Plans take state contingency plans into account. Coast Guard responders indicated

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[122] *Federal Gov't Halts Sand Berm Dredging*, WDSU (June 23, 2010), http://www.wdsu.com/r/23997498/detail.html.

[123] Chris Kirkham, *Louisiana Officials Urge Feds to Let Dredging Continue on Berm to Fight Gulf Oil Spill*, TIMES-PICAYUNE (June 23, 2010).

[124] Chris Kirkham, *Dredging on Sand Barriers to Continue When Weather Improves*, TIMES-PICAYUNE (June 30, 2010).

[125] Interview with Coast Guard official.

[126] The governors of Louisiana, Mississippi, Alabama, and Florida all declared a state of emergency. They also all appointed themselves the state on-scene coordinator. Press Release, Governor Jindal Issues State Declaration of Emergency (Apr. 29, 2010), (http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&catID=2&articleID=2137&navID=3); Press Release, Gov. Riley Declares State of Emergency to Prepare for Oil Approaching Alabama Coast (Apr. 30, 2010), (http://governorpress.alabama.gov/pr/pr-2010-04-30-04-emergency.asp; State of Florida, Office of the Governor, Executive Order 10-99 (Apr. 30, 2010), http://www.dep.state.fl.us/deepwaterhorizon/files/authorizations/043010_eo1.pdf); State of Mississippi, Office of the Governor, Executive Order No. 1038 (Apr. 30, 2010), (http://www.governorbarbour.com/news/2010/apr/Orders%20for%20Coast.pdf). *See also* Press Release, BP, BP Announces Tourism Grants to Four Gulf States (May 17, 2010), *available at* http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7062187.

that they knew that the states had contingency plans but they were not familiar with them.[127] A requirement that planning documents be consistent and incorporate each other might help to ensure the engagement of responders at all levels.

b. Local officials

The failure of the planning process to adequately involve state governments was magnified at the local level. Local communities were not involved in the contingency planning process nor were they anticipated to play a large role in the response. The applicable area contingency plan, called the One Gulf Plan, has no reference to the role of local officials or local communities in general. Two of the area contingency plans included in the One Gulf Plan do include a section instructing planners to coordinate with state and local officials. The New Orleans Area Contingency Plan, for example, instructs the Area Committee planner to work "with state and local officials to pre-plan for joint response efforts, including appropriate procedures for mechanical recovery, dispersant use, shoreline cleanup, protection of sensitive environmental areas, and protection, rescue, and rehabilitation of fisheries and wildlife. The Area Committee is required to work with state and local officials to expedite decisions for the use of dispersants and other mitigating substances and devices."[128] The Commander of the Port for Morgan City, Louisiana mentioned that he had always invited parish representatives to area committee planning meetings, but that they did not often attend. Before the Deepwater Horizon, when there had been an incident, Coast Guard responders would telephone parish representatives to provide information.[129] Overall, the pre-Deepwater Horizon level of parish involvement in spill planning or spill response was low.

In other regions, local officials are sometimes involved through a local on-scene coordinator. Area contingency plans in Alaska and in San Francisco both provide for such a coordinator.[130] Planners in San Francisco realized they needed to incorporate a way to address local concerns after the *Cosco Busan* oil spill in San Francisco Bay in November 2007.

Because local officials did not have a clear role in the Deepwater Horizon response, many felt ignored by federal responders. This contributed to their empowerment, as discussed above, to go directly to BP for response funding. This problem seemed to be exacerbated in Louisiana, where the unique parish structure and home rule provisions gave a great deal of autonomy to local governments. In Mississippi and Alabama, though there were local issues and local mayors expressed concerns about the response, the unified command was able to work more directly with the State On-Scene Coordinator, who in turn worked with county and town governments.[131] Planning did not take into account the differing governance structures of the Gulf states.

The Commission may want to consider recommending changes to better incorporate existing local emergency response structures, both to build trust between the federal government

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[127] Interview with Coast Guard official.
[128] SECTOR NEW ORLEANS, LOUISIANA, GEOGRAPHIC RESPONSE PLAN 8 (1999).
[129] Interview with Coast Guard official.
[130] *See* ALASKA REGIONAL RESPONSE TEAM, http://www.akrrt.org/plans.shtml (1999); Meeting Notes from California Emergency Management Agency meeting (Aug. 12, 2009), http://www.calema.ca.gov/WebPage/oeswebsite.nsf/ClientOESFileLibrary/Coastal%20Region%20Branch/$file/2009.08.12.pdf.
[131] Interviews with Coast Guard officials.

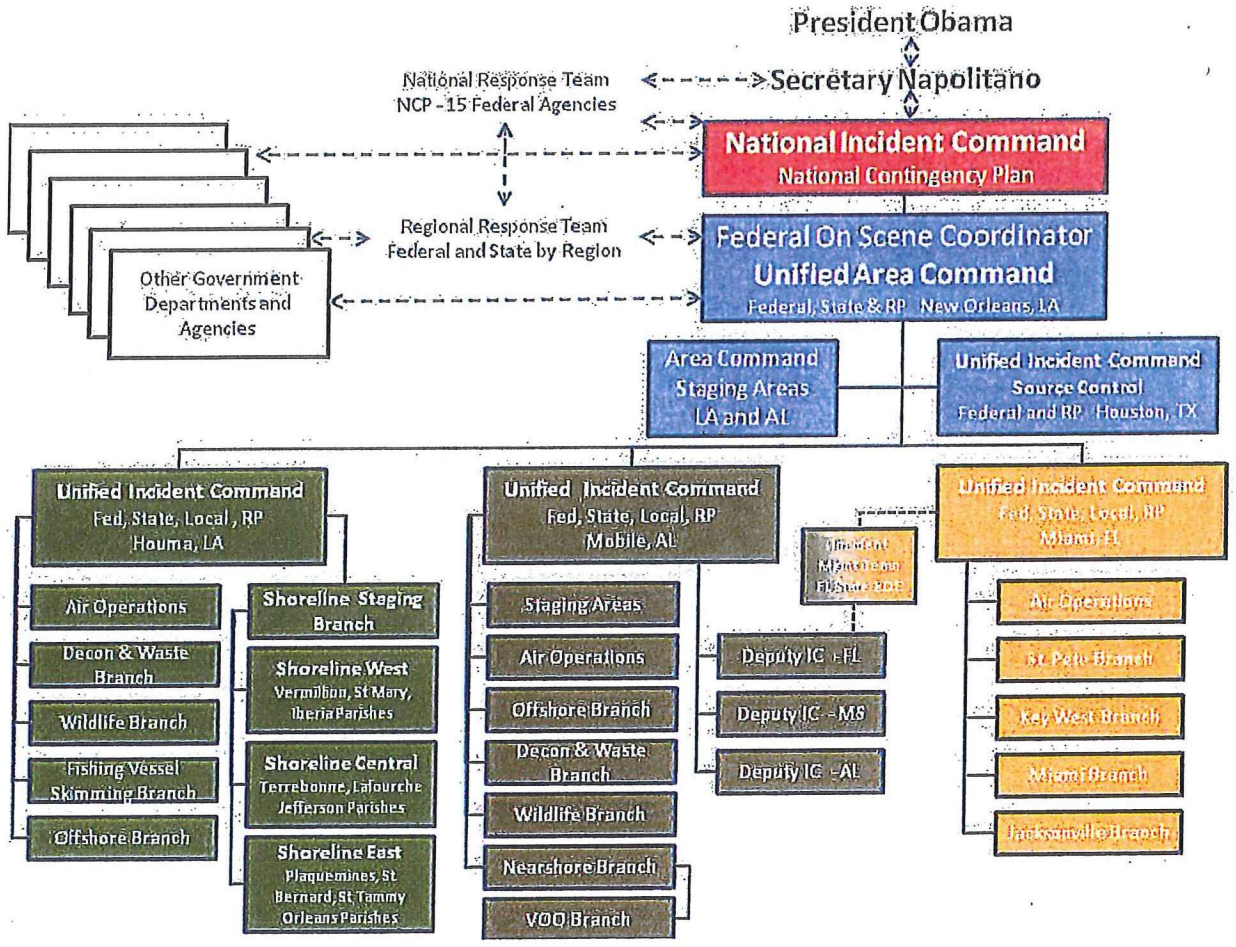
and local officials and to utilize local expertise and resources. The creation of emergency response structures is currently a high priority for many states and local governments, and the federal government has grant programs in place to support this priority.[132] Incorporating some of these structures would potentially require changing the NCP to direct that the Area Contingency Planning process involve local leaders in the unified command, either as principal players or on a consulting basis. The regions that currently have local on-scene coordinators are very different from the Gulf of Mexico in terms of the diversity and sheer number of shoreline communities potentially affected by a spill. However, there may be ways in which the federal government can use the local on-scene coordinator model to access local government emergency response structures. This involvement could take place during the planning process, by creating a local position to facilitate the inclusion of local resources and concerns in contingency plans. The local on-scene coordinator, or coordinators for many communities, could participate in spill response by organizing local volunteers, cataloging response resources, and serving as a point of contract for local concerns.

Suggestions for the Commission's consideration:

- Consider clarifying at the national, state, and local level the differences between the Stafford Act and the NCP.
- Consider recommending higher-level state involvement in the contingency planning process, potentially including involvement of political in addition to career officials.
- Establish liaisons between the unified command and affected local communities early in the spill response process, possibly through the creation of a local-on scene coordinator position. Consider recommending ways to incorporate local emergency response structures into contingency planning.

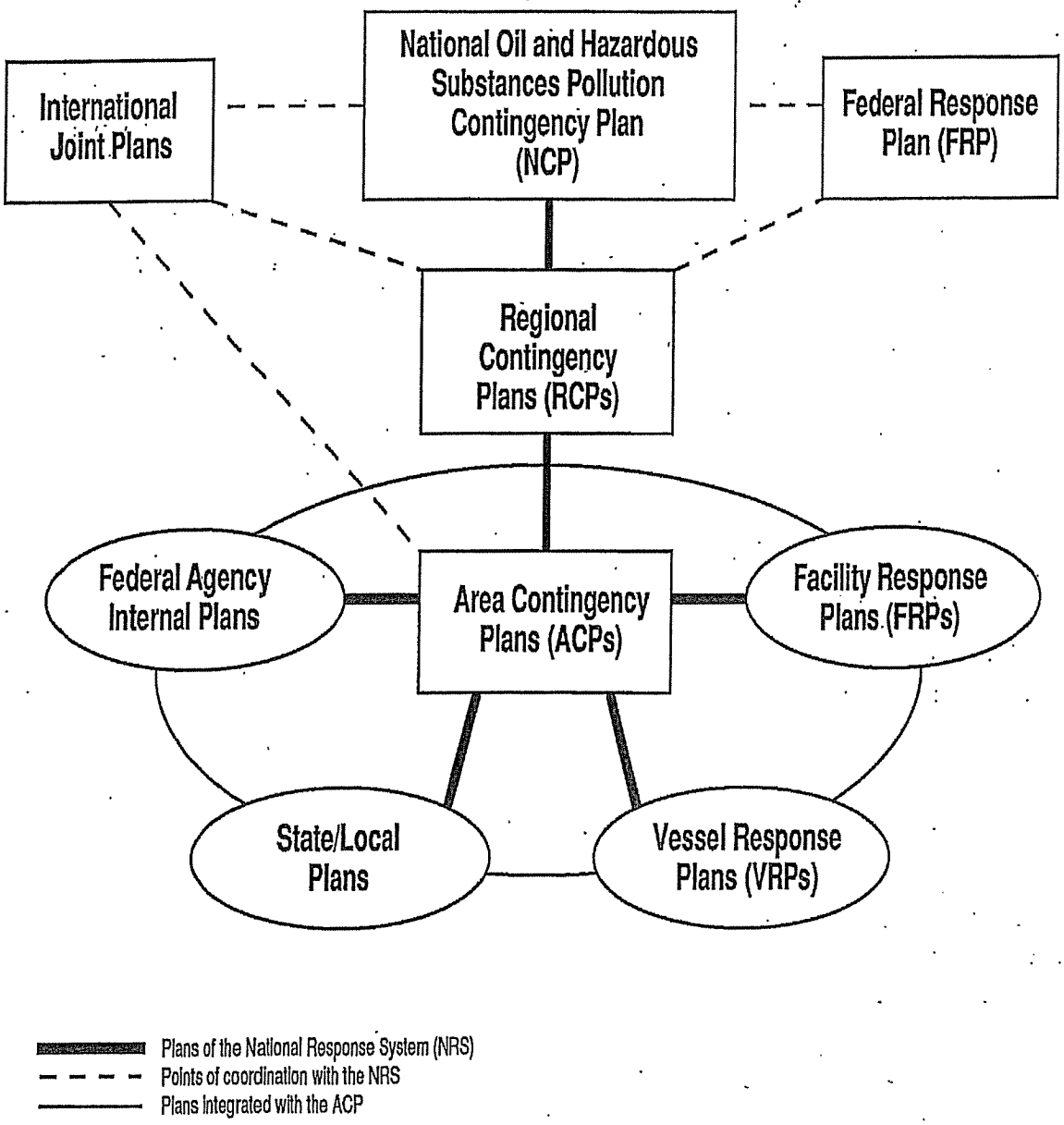
[132] *See, e.g.*, FEMA, FY2010 EMERGENCY MANAGEMENT PERFORMANCE GRANTS (EMPG), http://www.fema.gov/government/grant/empg/index.shtm; Emergency Management; Interview with Coast Guard official.

General Overview of the Deepwater Horizon Response Structure



Source: Congressional Research Service

Relationship of Plans



Source: National Contingency Plan, 40 C.F.R. § 300.205(g), Figure 4.

RETIRED ADMIRAL THAD ALLEN

National Incident Commander for the Unified Command

Day 1, Panel 1a: Decision-Making Within the Unified Command

Anticipated Focus:

Ret. Admiral Thad Allen will discuss his role as Commandant of the United States Coast Guard during the first ten days of the Deepwater Horizon spill, and how his role changed when, on May 1, 2010, he was appointed National Incident Commander in charge of overseeing the spill response. Allen will explain how the decision-making structure evolved over the course of the response. He will also give his perspective on whether federal responders effectively coordinated with state and local officials, and what measures might improve that relationship during future spill responses. Additionally, Allen can speak to the role BP played in the Unified Command structure, and whether the role of the responsible party should be altered going forward. Finally, Allen can compare emergency response under the National Contingency Plan with response under the Stafford Act. He can contrast his role as Principal Federal Officer during the Hurricane Katrina response with his role here as National Incident Commander.

Biography:

Ret. Admiral Thad Allen oversees ongoing response efforts to mitigate the Deepwater Horizon oil spill, including the continued deployment and coordination of vital response assets, personnel and equipment. He works with the Federal On-Scene Coordinator, the Departments of Homeland Security, Defense, Interior and Commerce, the Environmental Protection Agency and other federal departments and agencies as appropriate as well as British Petroleum, the responsible party in the spill.

Allen was appointed National Incident Commander in charge of the nation's response to the oil spill by President Barack Obama on May 1, 2010. Allen held this position while finishing his tenure as the 23rd Commandant of the U.S. Coast Guard. He was relieved after his four-year term as Commandant on May 25, 2010 by Admiral Robert J. Papp. Prior to assuming his position as Commandant, Allen served as the Coast Guard Chief of Staff and Commanding Officer at the Coast Guard Headquarters, in Washington, D.C. from May 2002 to April 2006. He also served as Chairman of the Department of Homeland Security's Joint Requirements Council from 2003 to 2006. In September 2005, Allen was designated the principal federal official for Hurricane Katrina response and recovery operations in Louisiana, Mississippi and Alabama. He also served as the principal federal officer for Hurricane Rita response and recovery activities in Louisiana.

Prior to his assignment as Chief of Staff, Allen served as Commander, Coast Guard Atlantic Area, Fifth Coast Guard District, and U.S. Maritime Defense Zone Atlantic in Portsmouth, Va., where he was the operational commander for all Coast Guard activities in an area of responsibility spanning five Coast Guard Districts. This encompassed more than 14 million square miles and involved 26,000 military and civilian employees as well as 27,900 auxiliarists. Allen also led the Coast Guard's Atlantic Area forces in response to the terrorist attacks of September 11, 2001. A specialist in operations in both coastal and offshore environments, Allen has served aboard three Coast Guard cutters: the Androscoggin, Gallatin and Citrus, which he commanded. His coastal command operational assignments include Captain of the Port, Group Long Island Sound, Connecticut; Group Atlantic City, New Jersey; and LORAN Station Lampang, Thailand. Allen holds a Master of Public Administration from the George Washington University and a Master of Science from the Sloan School of Management at the Massachusetts Institute of Technology.

CAPTAIN EDWIN M. STANTON

Sector Commander, Mobile, United States Coast Guard

Day 1, Panel 1b: Decision-Making Within the Unified Command

Anticipated Focus:

Captain Edwin M. Stanton will discuss his role on the front lines of the response, including his views on the sufficiency of resources and personnel to fight the spill. He will comment on the organizational structure established as part of the response, as well as on BP's role in that structure. Stanton will also speak to the interaction, both positive and negative, between federal responders and state and local officials. He will discuss the differences between other types of emergency responses (for example, hurricane response under the Stafford Act) and responses under the National Contingency Plan, and he will comment on the issues that arose as a result of state and local responders' unfamiliarity with the National Contingency Plan.

Biography:

Captain Edwin M. Stanton enlisted in the Coast Guard in 1975, serving aboard the Coast Guard Cutter *Westwind* and at the Marine Safety Office in Sturgeon Bay, WI. He graduated from Officer Candidate School in 1981. His first tour following OCS began at Marine Safety Office, Mobile, during which he trained as a Marine Investigator, Marine Inspector and Port Operations Officer. From 1989 to 1992, he served as Executive Officer of the Atlantic Area Strike Team, a specialized oil and hazmat response team, in Mobile. Stanton responded to major oil spills in St. Croix, U.S. Virgin Islands, following Hurricane Hugo and the major spill from the tank barge *Apex* in Galveston Bay, Texas. He was responsible for providing oil and hazardous materials response training for all Coast Guard Marine Safety Offices in the Atlantic Area. From 1992 to 1997, Stanton served as Operations Officer and Executive Officer of Marine Safety Office San Juan, Puerto Rico. He was the Operations Section Chief and Deputy Incident Commander for the major oil spill from the barge *Morris J. Berman*, in Puerto Rico. The Commandant of the Coast Guard has described this spill response as a model response.

Stanton returned to Eighth District staff in 1997, as the Response Division Chief, serving as the Coast Guard Co-Chair for Regional Response Teams in Federal Regions 6, 7, and 8. In 2000, he became Commanding Officer of Coast Guard Gulf Strike Team, Mobile. He and his command responded to the anthrax incidents in Florida; the major oil spill from the tankship *Jessica* in the Galapagos Islands; the aftermath of the World Trade Center attack; the crash of the orbiter *Columbia*; and the ricin attacks on Congressional office buildings. He transferred to Coast Guard Headquarters in 2003 to serve as Chief of Response Division and Chief of the Office of Response. He also served as Vice Chair of the National Response Team.

In 2005, Stanton was selected as Deputy Commander, Sector Mobile. He arrived just in time for the infamous hurricane season of 2005, and was instrumental in Sector Mobile's outstanding response to Hurricane Katrina. He led the Coast Guard Reserve Incident Management Team that FEMA tasked with cleaning marine debris from 500 square miles of coastal Mississippi waterways, removing 300,000 cubic yards of debris at a cost well below estimates, while successfully meeting all other Sector mission demands. In 2007, he took over the helm as Sector Commander, Mobile. In 2008 and 2009, he was selected to represent the U.S. Coast Guard at the North Atlantic Coast Guard Forum as a subject matter expert in Environmental Response.

DOUG SUTTLES

Chief Operating Officer for Exploration and Production, BP

Day 1, Panel 1b: Decision-Making Within the Unified Command

Anticipated Focus:

Doug Suttles will discuss his coordination of BP's participation in the response efforts. He will speak to the overall role of BP as the responsible party and specifically to BP's role in the Deepwater Horizon well control and oil clean-up efforts. Suttles will also discuss interactions between BP and state and local officials outside of the Unified Command structure, including the $25 million payments to Louisiana, Mississippi, Alabama and Florida early in the response efforts.

Biography:

Doug Suttles was named president of BP Exploration (Alaska) Inc., taking over the company's top spot effective January 1, 2007. He also joined the board of BP America and the BP America Operations Advisory Board. BP, based in London, is the top oil and natural gas producer in the United States and has 40 percent of its assets and workers in North America.

Suttles previously worked for BP in Alaska in various engineering and leadership roles, and has 25 years experience in the oil and gas industry. He has held a number of senior leadership posts in BP, including president of BP Sakhalin Inc., where he was responsible for BP's activities in Sakhalin, Russia, and its joint venture with Rosneft, a major Russian oil company. Suttles has held other senior leadership roles in BP, including vice president for Northern North Sea operations and president of BP's Trinidadian oil business. Prior to joining BP, Suttles was with Exxon in Oklahoma and Texas.

Suttles serves on the boards of the Anchorage Museum Association, the Foraker Group and the Nature Conservancy. He is currently First Vice President and board member for The Alaska Oil and Gas Association. Suttles holds a B.S. in Mechanical Engineering from the University of Texas at Austin.

WILLIAM NUNGESSER

President of Plaquemines Parish, Louisiana

Day 1, Panel 1b: Decision-Making Within the Unified Command

Anticipated Focus:

Parish President William Nungesser will discuss his criticisms of the Unified Command's response to the Macondo spill. He will share his views on berm construction and his frustration with the Army Corps of Engineers' approval process for Louisiana's request to build berms around the barrier islands. Nungesser will also speak to the deployment of boom and skimmers around the coastline in Plaquemines Parish, and to whether those resources were deployed quickly enough and in adequate numbers. Finally, he will address his interactions with federal responders, his view of local involvement in response efforts, and his ideas to make response efforts more inclusive of local concerns.

Biography:

Parish President William Nungesser has a distinguished resume of service that goes back to 1983, when Governor David Treen appointed him to the Lake Pontchatrain and Maurepas Study Commission. In 1986, he was appointed by President Ronald Reagan to the Republican Presidential Task Force. In 2004, as Chairman of the Plaquemines Parish United Way, Nungesser led a record breaking fund raising campaign. His team raised more than $237,000 for the people of the parish.

Nungesser took office sixteen months after Hurricanes Katrina and Rita devastated Plaquemines Parish. As Parish President, he has worked closely with local, state and federal officials, receiving record amounts of capital outlay money as well as record amounts of state and federal grant monies for much needed infrastructure projects in the parish. When he took office, Nungesser found that 400 project worksheets had been authorized by FEMA for a total value of $109 million dollars. Because this number did not reflect the scope of damage Plaquemines Parish had sustained as a result of the two hurricanes, Nungesser immediately began working with FEMA and the Corps of Engineers. These efforts have raised the number of project worksheets to 500, obligated and approved at one hundred percent, for a total of $322.5 million dollars.

Nungesser is determined to rebuild and restore Plaquemines Parish, not only to where it once was, but better than before.

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

THE AMOUNT AND FATE OF THE OIL

---Draft---

Staff Working Paper No. 4[1]

The federal government's estimates of the amount of oil flowing into and later remaining in the Gulf of Mexico in the aftermath of the Macondo well explosion were the source of significant controversy. As a result, they undermined public confidence in the federal government's response to the spill. By initially underestimating the amount of oil flow and then, at the end of the summer, appearing to underestimate the amount of oil remaining in the Gulf, the federal government created the impression that it was either not fully competent to handle the spill or not fully candid with the American people about the scope of the problem. In the context of such a national disaster, neither impression is acceptable.

Federal government responders may well be right in their assertions that low flow-rate estimates did not affect the scale of their operations, which were limited not by the estimates but by the practical availability of resources. But a loss of the public's trust during a disaster is not merely an incidental public relations problem. It can have serious and widespread consequences. The absence of trust fuels public fears, and those fears in turn can cause major harm, whether because the public loses confidence in the federal government's assertions that beaches or seafood are safe, or because the government's lack of credibility makes it harder to build relationships with state and local officials, as well as community leaders, that are necessary for effective response actions.

This working paper first tells the story of the government's struggle to accurately estimate the rate of oil flow from the Macondo well. It next discusses the debate surrounding the government's report on the fate of the oil.[2] More extensive, peer-reviewed government reports, which will allow for greater substantive evaluation of the government's flow-rate and fate of the oil estimates, are forthcoming. In the meantime, this paper discusses some of the key government estimates with a view towards eventual Commission findings regarding whether flow-rate estimates should have been more accurate from the outset, and whether the government presented information regarding the amount and fate of the oil to the public in an appropriate manner. Commission staff believe that recommendations aimed at improving the quality of

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[1] Staff Working Papers are written by the staff of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling for the use of members of the Commission. They are preliminary and do not necessarily reflect the views of the Commission or any of its members. In addition, they may be based in part on confidential interviews with government and non-government personnel.

[2] DEEPWATER HORIZON MC252 GULF INCIDENT OIL BUDGET [hereinafter OIL BUDGET] (Aug. 4, 2010), *available at* http://www.noaanews.noaa.gov/stories2010/PDFs/DeepwaterHorizonOilBudget20100801.pdf.

information provided to the public are critical to improving public confidence, and thus to the success of future emergency responses.

I. FLOW RATE: THE AMOUNT OF OIL RELEASED

This Part of the paper describes governmental and non-governmental efforts to accurately estimate the flow of oil from the Macondo well. It attempts to frame the questions of why initial government estimates were so inaccurate, and whether the information conveyed to the public was different from operational estimates used by responders or other information known to the government. Section A charts flow-rate estimates created during the spill's first month. Section B discusses the question of which estimates—the low flow-rate estimates, or worst-case estimates—were the basis of government operations. Section C considers whether the Flow Rate Technical Group, the government team assembled to address the gulf between official and independent flow-rate estimates, addressed the problem of failing public confidence due to inaccurate estimates. Finally, Section D compares the flow-rate estimates of nongovernmental scientists generated since the well was capped with the government's current flow-rate figures.

A. The First Month

On the evening of April 20, 2010, the U.S. Coast Guard District Eight command center in New Orleans, Louisiana received a report of an explosion and fire aboard the mobile offshore drilling unit Deepwater Horizon.[3] On the morning of April 22, 2010, the Coast Guard informed the media that the rig was leaking oil at a rate of 8,000 barrels per day (bbls/day), and that responders were preparing for a leak of up to 700,000 gallons of diesel fuel (the total amount of fuel the rig could hold).[4] Later that morning, Deepwater Horizon sank, leaving a one mile by five mile sheen on the ocean's surface.[5]

How much oil was leaking into the Gulf of Mexico? For responders, politicians, and the public alike, the leaking well's "flow rate" quickly became a crucial and controversial question. Throughout the first month of the spill, government responders officially adhered to what we now know were extremely low and inaccurate estimates. Nongovernmental scientists, on the other hand, used the small amount of publicly available flow data to generate estimates that have proven to be much more accurate. To make forward-looking recommendations, it is important to understand how this came to pass.

1. The Government's Estimates

As a first step in determining whether, or how much, oil was flowing from the Macondo well, BP enlisted remotely operated vehicles (ROVs) to investigate the immediate wellhead area.

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[3] Press Release, United States Coast Guard, Coast Guard Responding to Oil Drilling Platform Fire (Apr. 21, 2010), http://app.restorethegulf.gov/go/doc/2931/525679/.

[4] *See* CNN Wire, *Coast Guard: Oil Rig That Exploded Has Sunk*, CNN (Apr. 22, 2010), http://news.blogs.cnn.com/2010/04/22/coast-guard-oil-rig-that-exploded-has-sunk/.

[5] *See* CNN Wire, *Oil Slick Spreads from Sunken Rig*, CNN (Apr. 22, 2010), http://www.cnn.com/2010/US/04/22/oil.rig.explosion/index.html.

These ROVs did not uncover any leaks.[6] Rear Admiral Mary Landry, the Federal On-Scene Coordinator (and the ranking federal official on the spill response team at the time) told *CBS News* on April 23, 2010 that "at this time there is no crude emanating from that wellhead at the ocean floor . . . . there is not oil emanating from the riser either."[7]

But at the time of Admiral Landry's statement, the riser had not yet been inspected. Over the next 24 hours, BP's ROVs traced the riser from the wellhead to where the Deepwater Horizon rig had come to rest, approximately 1,500 feet from the blowout preventer (BOP). The ROVs discovered two leaks, one from a kink in the riser above the BOP ("kink leak") and a primary leak from the end of the riser, where it had broken off from the rig.[8]

After the discovery of these leaks on April 24, 2010, Coast Guard and BP officials put out an estimate: Up to 1,000 bbls/day were flowing from the two leaks in the riser.[9] Neither the Coast Guard nor BP divulged the data or methodology behind this estimate. Based on the information we have to date, it appears the figure came from BP without supporting documentation.[10]

In the spill's second week, the official flow-rate estimate increased from 1,000 bbls/day to 5,000 bbls/day as a result of input from the National Oceanic and Atmospheric Administration (NOAA). On April 28, 2010, Admiral Landry stated that "NOAA experts believe the output could be as much as 5,000 barrels."[11] Although Admiral Landry did not provide further explanation, the media speculated that this latest estimate was derived through a method known as the "Bonn Convention."[12] The method involves using aerial data to measure the extent of the spill, using color to estimate the thickness of various parts of the spill, and then calculating the volume.[13]

The source of the 5,000 bbls/day estimate appears to have been an unsolicited, one-page document sent in an email to Admiral Landry's Scientific Support Coordinator on April 26, 2010 by a NOAA scientist.[14] The scientist derived an "estimated present volume release rate" of roughly 5,000 bbls/day, based on visual observation of the speed at which oil was leaking from

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[6] Press Conference, Admiral Mary Landry and Doug Suttles, New Orleans, LA (Apr. 28, 2010), http://cgvi.uscg.mil/media/main.php?g2_itemId=843309.

[7] Television Interview of Mary Landry, *Coast Guard: Oil Not Leaking from Sunken Rig*, CBS NEWS (Apr. 23, 2010), http://www.cbsnews.com/video/watch/?id=6424647n.

[8] Press Conference, Admiral Mary Landry and Doug Suttles, New Orleans, LA (Apr. 28, 2010); Campbell Robertson, *Oil Leaking Underwater From Well in Rig Blast*, N.Y. TIMES (Apr. 24, 2010).

[9] *See, e.g.*, Press Release, Unified Command, Unified Command Continues to Respond to Deepwater Horizon (Apr. 25, 2010), http://app.restorethegulf.gov/go/doc/2931/529883/; Robertson, *Oil Leaking Underwater From Well in Rig Blast.*

[10] Interviews with government officials.

[11] Press Conference, Admiral Mary Landry and Doug Suttles, New Orleans, LA (Apr. 28, 2010); Tim Dickinson, *The Spill, the Scandal, and the President*, ROLLING STONE (June 8, 2010).

[12] *See, e.g.*, Joel Achenbach, *How Big is the Gulf Spill, Really?*, SEATTLE TIMES (May 13, 2010); Justin Gillis, *Size of Spill Is Underestimated, Scientists Say*, N.Y. TIMES (May 13, 2010).

[13] NOAA, OFFICE OF RESPONSE AND RESTORATION, OPEN WATER OIL IDENTIFICATION JOB AID FOR AERIAL OBSERVATION (Nov. 2007), http://response.restoration.noaa.gov/book_shelf/1462_FINAL%20OWJA%202007.pdf.

[14] NOAA Document. The scientist also verbally noted to the Scientific Support Coordinator that the volume might be upwards of 10,000 bbls/day. Internal NOAA e-mail.

the end of the riser.[15] While he also used a method based on satellite imagery that was similar to the Bonn Convention to estimate that 10,000 barrels of oil were on the ocean's surface, he did not base his flow-rate estimate on that surface volume estimate. (He noted, moreover, that estimating surface volume from the visual appearance of an oil slick was "a highly unreliable process.")[16]

The NOAA scientist's 5,000 bbls/day estimate did not take into account the kink leak, and his methodology for estimating the velocity of the leaking oil was imprecise.[17] Further, there is no indication that the scientist had expertise in estimating deep-sea flow velocity from video data, or that he used an established or peer-reviewed methodology when doing so. This is in not a criticism of the scientist, who made clear his assumptions and that the 5,000 bbls/day figure was a "very rough estimate[]."[18]

Despite these acknowledged inaccuracies, and despite the existence of other and potentially better methodologies for visually estimating flow rate (discussed below), 5,000 bbls/day was to remain the government's official flow-rate estimate for a full month, until May 27, 2010.[19]

2. Nongovernmental Estimates

From the outset, estimates from nongovernmental sources were significantly higher than official government estimates. In at least some instances, the cause of the discrepancy appears to be that non-government scientists relied on more refined or better-established methodologies.

a. Estimates Based on Satellite Imagery

The first independent flow-rate estimate surfaced on April 27, 2010, at the time the official estimate was 1,000 bbls/day. Using publicly available satellite images, John Amos, the founder of SkyTruth.org, estimated the leak size to be at least five times the government

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[15] NOAA Document. The scientist generated this number by assuming that the flow came from a hole with a diameter of 40 centimeters, at a velocity of 15 cm/sec, and that 50% of the total flow was oil (as opposed to gas and other material).

[16] *Id.*; Interview with government official. The surface volume calculation was based on an American Society for Testing and Materials standard for determining surface oil thickness. The scientist also assumed that at least half of the oil released evaporated or dispersed in the water column before reaching the surface. Based on those assumptions, the surface volume estimate could have confirmed or yielded a flow-rate estimate of 5,000 bbls/day. E.g., if the oil first began leaking on April 22, 2010, one could then take the 10,000 barrel figure, double it to account for evaporation and dispersion, and then divide by 4 days to arrive at 5,000 bbls/day. The one-page document, however, did not take these steps. Instead, it estimated the "present volume release rate" of 5,000 bbls/day based on visual observation of the velocity of the material in the oil plume leaking from the riser.

[17] NOAA Document. For example, the document notes that the velocity could be "between 7 cm/sec and 30 cm/sec" and then, without explanation, uses 15 cm/sec when generating the 5,000 bbls/day estimate (using 30 cm/sec, the estimate is over 10,000 bbls/day).

[18] Internal NOAA e-mail.

[19] *See* Press Release, Unified Command, Flow Rate Group Provides Preliminary Best Estimate of Oil Flowing from BP Oil Well (May 27, 2010), http://app.restorethegulf.gov/go/doc/2931/569235/.

estimate—5,000 to 20,000 bbls/day.[20] Amos generated the low number in his range by multiplying the surface area of the spill by what he considered the minimum thickness for oil to be visible on the Gulf's surface (1 micron). He then generated the high number by relying on a BP statement that 3% of the slick was significantly thicker (100 microns). Amos's estimate was conservative (i.e., low) in assuming that none of the oil had burned with the rig, been collected by response crews, evaporated, dispersed, or was then below the surface.[21] Within a couple days, Amos's estimate appeared in the national press.[22]

On May 1, 2010, Dr. Ian MacDonald (a Florida State University oceanographer) published a new estimate on SkyTruth. Using a Coast Guard map that tracked the spill's surface size and classified the color of the surface oil throughout, Dr. MacDonald generated a flow estimate of 26,500 bbls/day using the Bonn Convention. Like Amos, he assumed that none of the oil had burned, evaporated, dispersed, been skimmed, or was then below the surface.[23]

Both independent scientists estimated the spill's volume from the visual appearance of the surface slick—the same general method used by the government scientist who generated the 10,000 barrel surface volume estimate. Experts note that such methods are not reliable for estimating the volume of large spills, due in part to the difficulty of accurately determining oil thickness from aerial data.[24] Dr. MacDonald, however, did at least use an established protocol—the Bonn Convention—for determining surface oil thickness. Similarly, Amos explained the basis for his minimum and maximum assumptions regarding thickness. By contrast, the NOAA surface volume estimate appears to have been based on an unexplained assumption that 99% of the spill was 0.1 microns thick, while the remainder was 100 microns thick. Thus, while estimating volume from surface appearance may be inherently unreliable, the non-government scientists were clearer about their methodologies, possibly leading their estimates to be closer to the actual flow rate (though still far off).

b. Estimates Based on Video of the Flow

On May 12, 2010, BP released a thirty-second video of oil coming out of the end of the broken riser—a crucial piece of data. As discussed above, the government's estimate of 5,000 bbls/day appears to have been based on visual observation of flow from the riser. Within 24

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[20] *See* John Amos, *Gulf Oil Spill Rate Must Be Much Higher Than Stated—6 Million Gallons So Far?*, SKYTRUTH.ORG (Apr. 27, 2010), http://blog.skytruth.org/2010/04/gulf-oil-spill-rate-must-be-much-higher.html; John Amos, *Gulf Oil Spill—Bigger Than Exxon Valdez*, SKYTRUTH.ORG (Apr. 28, 2010), http://blog.skytruth.org/2010/04/gulf-oil-spill-bigger-than-exxon-valdez.html.

[21] *Id.* Amos assumed that all oil leaking from the well reached the surface to be observed. If that were not the case, the estimated flow rate would be higher.

[22] Ian Talley, *Experts: Oil May Be Leaking at Rate of 25,000 Barrels a Day in Gulf*, WALL ST. J. (Apr. 30, 2010); *see also* Emily Gertz, *Gulf Oil Spill Far Worse Than Officials, BP Admit, Says Independent Analyst*, ONE EARTH BLOG (Apr. 29, 2010), http://www.onearth.org/node/2084.

[23] John Amos, *Gulf Oil Spill – New Spill Calculation – Exxon Valdez Surpassed Today*, SKYTRUTH.ORG (May 1, 2010), http://blog.skytruth.org/2010/05/gulf-oil-spill-new-spill-rate.html.

[24] Achenbach, *How big is Gulf Spill, Really?*; Gillis, *Size of Oil Spill Underestimated, Scientists Say.*

hours, at least three scientists had used various methodologies to derive estimates of the flow rate substantially greater than the government's then-current estimate:[25]

- **Dr. Timothy Crone**, a marine geophysicist at Columbia University's Lamont-Doherty Earth Observatory, estimated that 50,000 to 100,000 bbls/day of total flux were flowing out of the end of the riser.[26] To determine the velocity of the flow, Dr. Crone used a technique called Optical Plume Velocimetry, which involves temporal cross-correlation of the visual intensity of two pixels in a video (both in the plume, one downstream from the other). He developed this technique in a 2008 peer-reviewed paper relating to flow rates.[27]

- **Dr. Eugene Chiang**, an astrophysicist at the University of California at Berkeley, estimated the total flux from the end of the riser to be between 20,000 and 100,000 bbls/day.[28] Dr. Chang's is an expert in orders-of-magnitude estimation (i.e., estimating size or scale from small amounts of data). He estimated the velocity of oil coming out of the riser based on the angle of flow and the rate at which oil would naturally rise through sea water. He used this information to estimate the diameter of the riser, which generated the high end of his range; he based the low-end number on information that the plume could be emanating from a smaller pipe within the riser.[29]

- **Dr. Steven Wereley**, a mechanical engineer at Purdue University and expert in fluid mechanics, estimated that the total flux from the end of the riser was 72,179 bbls/day (±20%).[30] To arrive at this estimate, Dr. Wereley used a method called Particle Image Velocimetry, which uses a computer program to identify and track distinct "flow structures" in the plume exiting the riser (akin to the billows of a cloud). The method analyzes how fast structures move across the screen in terms of pixels, and then factors in scale and volume to determine flow rate.[31] Dr. Wereley co-authored a 2007 book on this flow rate estimation method.[32]

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[25] Richard Harris, *Gulf Spill May Far Exceed Official Estimates*, NATIONAL PUBLIC RADIO (May 14, 2010), http://www.npr.org/templates/story/story.php?storyId=126809525.

[26] *Id.*; Raymond Gellner, *BP Oil Spill Rate in Gulf May Be 3 Million Gallons Per Day*, WORLD NEWS EXAMINER (May 14, 2010); Telephone Interview with Dr. Timothy Crone, Lamont-Doherty Earth Observatory (Aug. 18, 2010 and Sept. 3, 2010). Dr. Crone noted that his early estimates could not be more precise because of the low quality and short duration of the video.

[27] Crone, McDuff, & Wilcock, *Optical Plume Velocimetry: A New Flow Measurement Technique for Use in Seafloor Hydrothermal Systems*, EXPERIMENTS IN FLUIDS, vol. 45, no. 4, at 899-915 (2008).

[28] Harris, *Gulf Spill May Far Exceed Official Estimates.*

[29] *Id.*; Telephone Interview with Dr. Eugene Chiang, University of California at Berkeley (Aug. 13, 2010).

[30] Harris, *Gulf Spill May Far Exceed Official Estimates*; *Sizing up the BP Oil Spill: Science and Engineering Measuring Methods*, Briefing Before the Subcomm. on Energy and Environment of the H. Comm. on Energy and Commerce, 111th Cong. (May 19, 2010) (testimony of Dr. Steven Wereley).

[31] *Sizing up the BP Oil Spill: Science and Engineering Measuring Methods*, Briefing Before the Subcomm. on Energy and Environment (May 19, 2010) (testimony of Dr. Steven Wereley).

[32] RAFFEL, WILLERT, WERELEY, & KOMPENHANS, PARTICLE IMAGE VELOCIMETRY: A PRACTICAL GUIDE (2d ed. 2007).

All of these non-government figures estimated the total flux being released from the end of the riser, which includes both oil and natural gas.[33] If we were to assume the then-current understanding that the flux was, in fact, 50% oil, the Crone, Chiang, and Wereley estimates would be, respectively: 25,000 – 50,000 bbls/day; 10,000 – 50,000 bbls/day; and 36,090 bbls/day. The Crone, Chiang, and Wereley estimates did not include flow from the kink leak, for which there was no public data.

BP attempted to dismiss the Crone, Chiang, and Wereley estimates. It told *National Public Radio* on May 13, 2010 that "there's no way to estimate the flow coming out of the pipe accurately."[34] Five days later, BP released the first video of the kink leak and an initial estimate that the flux was about 50% oil. Testifying before Congress the next day, Dr. Wereley estimated that the kink leak was producing a flow of roughly 25,000 bbls/day (±20%) of total flux. Adding that figure to his previous estimate of flow from the end of the riser (72,179 bbls/day of flux), he arrived at a total flow rate of approximately 50,000 bbls/day of oil.[35]

The Crone, Chiang, and Wereley estimates proved to be significantly more accurate than the official government estimates. The 5,000 bbls/day figure, based on the same type of visual observation as the Crone, Chiang, and Wereley estimates, appears to have used a cruder methodology than at least Crone and Wereley. It is possible that the early official flow estimates would have been more accurate if the government had either enlisted greater in-house scientific expertise, or enlisted outside scientific expertise by making available the data on which government estimates were based. The government appears to have taken an overly casual approach to the calculation and release of the 5,000 bbls/day estimate—which, as the only official estimate for most of May, took on great importance.

Suggestions for the Commission's Consideration:

- The Commission may wish to recommend adoption of policies or procedures to ensure that, in a federal spill response, the federal government dedicates appropriate scientific expertise to initial spill volume estimates, to the extent that it wishes to release such estimates. Existing Coast Guard policy directs responders not to "lose sight of the importance of accurate and timely spill volume quantification based on maximum potential volume during initial response actions,"[36] but the government's approach to

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[33] Telephone Interview with Dr. Chiang, (Aug. 13, 2010); Telephone Interview with Dr. Crone, (Aug. 18, 2010); Telephone Interview with Dr. Steven Wereley, Purdue University (Aug. 12, 2010). While estimates of the oil-to-gas ratio in the flux varied over the course of the spill, scientists from Woods Hole Oceanographic Institution took measurements at the source and concluded that it was 43.7% oil.

[34] MORNING EDITION, *Transcript: Gulf Spill May Far Exceed Official Estimates*, NATIONAL PUBLIC RADIO (May 14, 2010), http://www.npr.org/templates/transcript/transcript.php?storyId=126809525; Suzanne Goldenberg, *Marine Scientists Study Ocean-Floor Film of Deepwater oil leak*, GUARDIAN (May 13, 2010), http://www.guardian.co.uk/business/2010/may/13/bp-oil-spill-ocean-footage.

[35] *Sizing up the BP Oil Spill: Science and Engineering Measuring Methods*, Briefing Before the Subcomm. on Energy and Environment (May 19, 2010) (testimony of Dr. Steven Wereley).

[36] Coast Guard "ALCOAST" Bulletin, *Subject: Coast Guard Marine Environmental Response Doctrine—Incident Specific Preparedness Review (ISPR) Update* (Jan. 12, 2009), http://www.uscg.mil/announcements/alcoast/ALCOAST02209.txt.

initial volume estimates during the Deepwater Horizon spill does not appear to have been consistent with this policy.

- The Commission may wish to recommend that, where possible without compromising confidentiality or operations, the federal government disclose the methodology and/or data on which its spill volume estimates are based either to the public or to outside scientific experts. Such information would allow outside scientists to generate estimates or to offer informed criticism of the government's work, helping to refine and to increase public confidence in official estimates.

B. The Impact on Operations

Government responders have repeatedly insisted to Commission staff that low initial flow-rate estimates did *not* impact the response. Responders have uniformly maintained—and, indeed, publicly stated during the response itself—that they scaled their efforts to the "worst-case" spill scenario rather than to official flow-rate estimates. Because the worst-case figures that emerged within days of the spill, although imprecise, ended up being roughly equivalent to the actual flow rate, we cannot conclude that inaccurate official estimates adversely impacted the response operations. It may, however, have been better practice for the government to disclose the estimates that drove the Unified Command operational plan—that is, the operational worst-case discharge figures.

Soon after the spill began, frontline Coast Guard personnel requested worst-case discharge information from the Minerals Management Service and BP,[37] both of which reported a figure of 162,000 bbls/day (the worst-case estimate from BP's original drilling permit).[38] Coast Guard officials, however, told us that they did not believe the figure from the drilling plan was a credible worst-case estimate.[39] On April 23, 2010, the Coast Guard and NOAA received an updated estimate of 64,000-110,000 bbls/day.[40] By early May, BP had lowered its worst-case estimate to 60,000 bbls/day.[41] BP officials disclosed a similar estimate to Congress on May 4, 2010, stating during a briefing that the "maximum estimated flow would be 60,000 barrels a day, with a mid-range estimate of 40,000 barrels a day."[42]

Thus, although there is evidence to suggest that the worst-case discharge figures BP disclosed to the Unified Command and Congress did not conform to its internal worst-case

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[37] Interview with Coast Guard official.

[38] Interviews with Coast Guard officials; INITIAL EXPLORATION PLAN, MISSISSIPPI CANYON BLOCK 252, 7-1 (Mar. 10, 2009), *available at* http://www.gomr.boemre.gov/PI/PDFImages/PLANS/29/29977.pdf.

[39] Interview with Coast Guard official.

[40] U.S. COAST GUARD, DISTRICT EIGHT SITUATION REPORT, 18 (April 23, 2010), *available at* http://s3.documentcloud.org/documents/3176/uscg-logs.pdf; Ben Raines, *Video Shows Federal Officials Knew Quickly of Potential for Massive Oil Flow in Gulf Spill,* MOBILE PRESS-REGISTER (May 1, 2010), http://blog.al.com/live/2010/05/video_shows_federal_officials.html. The refined worst-case scenario figure apparently came from either the Minerals Management Service or BP, though its origin and underlying methodology have not been established. Interviews with government officials.

[41] Interviews with government officials.

[42] Press Release, Markey: New Flow Rate Shockingly Close to BP's Initial "Worst Case" Scenario (Aug. 2, 2010), http://markey.house.gov/index.php?option=com_content&task=view&id=4076&Itemid=141.

estimates,[43] front-line responders may have based their decision-making on estimates roughly reflecting the magnitude of the spill. Despite the fact that the Unified Command had this information, relied on it for operations, and publicly stated that it was operating under a worst-case scenario, however, the government never disclosed what its operational scenario was. As a confidential NOAA report drafted on April 28, 2010 noted, "[t]here is no official change in the volume released but the [Coast Guard] is no longer stating that the release rate is 1,000 barrels a day . . . [i]nstead they are saying that they are preparing for a worst-case release and bringing all assets to bear."[44] Responders stuck to this blueprint, insisting publicly that 1,000 or 5,000 bbls/day remained the best official flow-rate estimate, but that the government continued to scale the response to an *unquantified* worst-case scenario.[45]

The decision to withhold worst-case discharge figures may have been made above the operational level. It is the understanding of the Commission staff that the possibility of releasing the worst-case discharge figures was at least discussed at the Unified Command level.[46] The Commission staff has also been advised that, in late April or early May, 2010, NOAA wanted to make public some of its long-term, worst-case discharge models for the Deepwater Horizon spill but, before doing so, requested approval from the White House's Office of Management and Budget.[47] The Office of Management and Budget apparently denied NOAA's request.[48]

The Commission may wish to consider recommendations that encourage government responders to disclose information about the scenarios under which they are operating—in this case, the operational worst-case discharge estimates. Even putting aside the question of whether the public had a right to know the worst-case discharge figures, disclosure of those estimates, and explanation of their role in guiding the government effort, may have improved public

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[43] In May 2010, BP turned over a document to congressional investigators that demonstrated that their in-house estimates were as follows: "[e]xpected range of possible flow rates is 5,000 to 40,000 BOPD," the "[m]aximum theoretical flow rate is 60,000 BOPD," and, if the BOP and wellhead are removed, "the rate could be as high as ~ 100,000 barrels per day . . . ."; BP WORST CASE SCENARIO DOCUMENT, *available at* http://globalwarming.house.gov/files/WEB/flowrateBP.pdf; Ernest Scheyder, *BP Estimates Oil Spill Up to 100,000 Barrels Per Day in Document*, REUTERS (June 20, 2010), http://www.reuters.com/article/idUSN1416392020100620; Bryan Walsh, *The Worse Case Scenario Gets Worse for BP as New Documents Come to Light*, TIME (June 21, 2010), http://ecocentric.blogs.time.com/2010/06/21/the-worse-case-scenario-gets-worse-for-bp-as-new-documents-come-to-light/.

[44] Ben Raines, *Leaked Report: Government Fears Deepwater Horizon Well Could Become Unchecked Gusher*, MOBILE PRESS-REGISTER (Apr. 30, 2010), http://blog.al.com/live/2010/04/deepwater_horizon_secret_memo.html.

[45] *See, e.g.*, Press Briefing, Admiral Thad Allen (May 1, 2010), http://app.restorethegulf.gov/go/doc/2931/535447/ ("At the outset, when we realized that the unit had sunk, we made preparations to stage equipment for a worst-case scenario. The deployment of our equipment was not related to any of the early estimates related to 1,000 barrels a day or 5,000 barrels a day . . . ."); Press Briefing, Admiral Mary Landry (May 14, 2010), http://app.restorethegulf.gov/external/content/document/2931/555475/1/pressbrief_may14.pdf ("Whether the flow is one, five, 10, or 15 thousand barrels per day, the mobilization of resources has been to prepare for a worst-case scenario. Our resources and tactics are not constrained by flow estimates—I have to emphasize that."); Press Briefing, NOAA Administrator Jane Lubchenco (May 20, 2010), http://app.restorethegulf.gov/external/content/document/2931/562815/1/Teleconference_Lubchenco_May_20.562815.pdf ("The response to the spill has never been pegged to that estimate of [5,000 bbls/day] or any other estimate. We've always pegged our response to the worst-case scenario and had much more significant effort than would have been required had it only been five.").

[46] Interviews with government officials.

[47] *Id.*

[48] *Id.*

confidence in the response. Instead, government officials attempted to assure the public that they were not basing operations on the official flow-rate estimates, while not stating what they were basing operations on instead. That lack of information may have contributed to public skepticism about whether the government appreciated the size of the Deepwater Horizon spill and was truly bringing all of its resources to bear. Moreover, the national response may have benefited early on from a greater sense of urgency, which public discussion of worst-case discharge figures may have generated.[49]

Suggestions for the Commission's Consideration:

- The Commission may wish to consider recommendations that encourage government responders to scale operations to a credible worst-case scenario, as it appears they did here,[50] and to disclose information about such operational scenarios.

C. The Flow Rate Technical Group

Although responders asserted that accurate flow-rate estimates were not important to their operations, the Unified Command eventually felt a need to take leadership on the issue, possibly as a result of media attention and public criticism of the low early numbers.[51] On May 19, 2010, the National Incident Command spearheaded the creation of an inter-agency Flow Rate Technical Group (Flow Rate Group) and charged it with generating (1) a preliminary flow rate as soon as possible and (2) a final flow-rate estimate based on peer reviewed methodologies within two months.[52] On May 23, 2010, Dr. Marcia McNutt, Director of the U.S. Geological Survey and Science Advisor to the Secretary of the Interior, was appointed the Group's leader.[53]

The Flow Rate Group was originally comprised of three sub-groups, made up of both governmental and nongovernmental scientists: (1) the Plume Modeling Team, which used the Particle Image Velocimetry method to estimate flow velocity from video of the leaks; (2) the Mass Balance Team, which estimated spill size from aerial images taken by NASA's AVARIS aircraft; and (3) a team that analyzed the flow into the Riser Insertion Tube Tool to establish a baseline flow rate.

The Flow Rate Group enlisted nongovernmental scientists with applicable expertise and experience, including Dr. Wereley, a critic of the low early estimates. The Group's estimates, however, proved chronically low, too. In fact, the only *precise* estimates the Group published

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[49] *See* Draft Staff Working Paper: *Decision-Making Within the Unified Command*, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, at § II(B).

[50] It appears that such recommendations would be consistent with current Coast Guard policy. *See* Coast Guard "ALCOAST" Bulletin, Subject: Coast Guard Marine Environmental Response Doctrine—Incident Specific Preparedness Review (ISPR) Update (Jan. 12, 2009), http://www.uscg.mil/announcements/alcoast/ALCOAST02209.txt.

[51] Interview with government official.

[52] Coast Guard Document; Press Release, Deepwater Horizon Incident Joint Information Center, The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill (May 21, 2010), http://app.restorethegulf.gov/go/doc/2931/558871.

[53] Coast Guard Document.

appear to have been generated from data collected and analyzed by a team led by Secretary of Energy Steven Chu and a team from the Woods Hole Oceanographic Institution.

The initial success of the Flow Rate Group is questionable given that it did not appear to help generate an accurate preliminary flow-rate estimate. The Group's estimates may also have suffered from a failure to disclose enough information to enable other experts to assess the group's methodologies and findings. If more data produced by the Group had been made public, its estimates may have evolved, and become more accurate, with input from the broader scientific community.

1. May 27, 2010 Estimate (12,000-25,000 bbls/day)

The Flow Rate Group published its first estimate on May 27, 2010, noting that "[t]he only range of flow rates that is consistent with all 3 of the methods considered by the [the Group] is 12,000 to 19,000 barrels per day. Higher flow rates [of up to 25,000 bbls/day] are consistent with the data considered by [the Plume Team]."[54] The Group's press release contained little information as to how each of the three Flow Rate Group teams calculated those ranges other than to note that the Plume Team's range of 12,000-25,000 bbls/day was "an initial lower bound estimate."[55]

On June 2, 2010, the Flow Rate Group released a three page *Summary Preliminary Report* that explained the May 27, 2010 estimate in more detail.[56] That document noted that the Plume Team produced "a range of lower bounds" of 12,000 to 25,000 bbls/day (±40%), but did not elaborate on the underlying data or calculations.[57] Most significantly, the June 2, 2010 report did *not* include the upper ranges of the Plume Team's estimates because "[t]he experts concluded that the effect of the unknown unknowns made it more difficult to produce a reliable upper bound on the flow rate."[58] It is the Commission staff's understanding that the "lower bound" range was simply a collection of the minimum estimates produced by each of the Plume Team members. A few members had also produced maximum estimates, several of which were in excess of 50,000 bbls/day, but this upper bound was not released.[59]

2. June 10, 2010 Estimate (20,000-40,000 bbls/day)

On June 10, 2010, the Flow Rate Group announced a revised flow-rate estimate of 25,000 to 30,000 bbls/day with a lower bound of 20,000 and a higher bound of 40,000 bbls/day.[60] The Group produced a three page document called *Pooling Expert Assessments* to accompany those

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[54] Press Release, Deepwater Horizon Incident Joint Information Center, Flow Rate Group Provides Preliminary Best Estimate of Oil Flowing From BP Oil Well (May 27, 2010), http://app.restorethegulf.gov/go/doc/2931/569235.

[55] *Id.*

[56] MARCIA MCNUTT, SUMMARY PRELIMINARY REPORT FROM THE FLOW RATE TECHNICAL GROUP (June 2, 2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=33972.

[57] *Id.*

[58] *Id.*

[59] Interview with non-governmental source.

[60] Press Release, Deepwater Horizon Incident Joint Information Center, Admiral Allen; Dr. McNutt Provide Updates on Progress of Scientific Teams Analyzing Flow Rates From BP's Well (June 10, 2010), http://app.restorethegulf.gov/go/doc/2931/627011/.

estimates. That document provided intervals with high and low numbers from each of six members of the Plume Team, but only after a "statistical procedure" was applied to "reconcile" the different members' full ranges.[61]

The June 10, 2010 press release also noted an estimate by researchers with Woods Hole, led by Dr. Richard Camilli, who were conducting their work outside of the auspices of the Flow Rate Group but in coordination with Unified Command. On May 31, 2010, these researchers had used an ROV mounted with sonar and acoustic sensors to determine the volume and velocity of the outflow from the end of the riser and kink leak. Their initial rough estimate was a flow rate for total flux (oil plus gas) of between 65,213 and 124,991 bbls/day (0.12 to 0.23 cubic meters/second).[62] Along with the Flow Rate Group's press release, the government released a brief one-page statement by the Woods Hole team explaining the methodology behind the estimate.[63] Yet, seemingly because this estimate was given in cubic meters/second rather than bbls/day, it did not attract media attention.

3. June 15, 2010 Estimate (35,000-60,000 bbls/day)

On June 15, 2010, the Flow Rate Group announced that it had generated a new official flow estimate of 35,000 to 60,000 bbls/day in conjunction with Secretary Chu and Secretary of the Interior Ken Salazar.[64] According to the accompanying press release, the new estimate was "based on a combination of analyses of high resolution videos taken by ROVs, acoustic technologies, and measurements of oil collected by the oil production ship together with pressure measurements inside the top hat."[65] No additional information on methodology was included.

We now know that this estimate was aided by pressure readings from a sensor Secretary Chu's team had BP place in the Top Hat above the BOP on June 13, 2010.[66] Those sensor readings, along with data on the amount of oil being captured by the Top Hat and an estimate of the percentage of oil still escaping into the Gulf, allowed the team to generate a flow rate of approximately 60,000 bbls/day.[67]

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[61] ANTONIO POSSOLO AND PEDRO ESPINA, POOLING EXPERT ASSESSMENTS (June 8, 2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=34800. On the same day, the Plume Team issued a statement noting: "On May 27, the Team issued an Interim Report that established an estimated range for the minimum possible spillage rate but did not issue an estimate for a possible maximum value because the quality and length of the video data could not support a reliable calculation." BILL LEHR, STATEMENT OF THE PLUME TEAM OF THE FLOW RATE TECHNICAL GROUP (June 10, 2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=34638.

[62] Press Release, Deepwater Horizon Incident Joint Information Center, Admiral Allen; Dr. McNutt Provide Updates on Progress of Scientific Teams Analyzing Flow Rates From BP's Well. Commission staff converted the Woods Hole team's estimate from cubic meters per second to barrels per day.

[63] RICHARD CAMILLI, PRELIMINARY REPORT FROM THE WOODS HOLE OCEANOGRAPHIC INSTITUTION FLOW RATE MEASUREMENT GROUP (June 10, 2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=34799.

[64] Press Release, Deepwater Horizon Incident Joint Information Center, U.S. Scientific Team Draws on New Data, Multiple Scientific Methodologies to Reach Updated Estimate of Oil Flows from BP's Well (June 15, 2010), http://app.restorethegulf.gov/go/doc/2931/661583/.

[65] *Id.* "Top Hat" was the nickname for the loose-fitting cap placed over the top of the blowout preventer, which collected up to approximately 15,000 bbl/day from the Macondo well between June 3 to July 10, 2010.

[66] Henry Fountain, *BP Provides Plan to Speed Up Siphoning*, N.Y. TIMES (June 14, 2010).

[67] Interview with government official.

On June 14, 2010, Secretary Chu and his team, Secretary Salazar, and members of the Flow Rate Group hosted a conference call.[68] On the call, the teams decided that they would jointly announce a flow-rate range of 35,000-60,000 bbls/day. The Chu team's estimate accounted for the upper portion of the range, while the Flow Rate Group's work provided the lower end.[69]

4. The Current Estimate (52,700-62,200 bbls/day)

The June 15, 2010 estimate was finally updated on August 2, 2010. A press release announced that, at the outset of the spill, the flow rate was 62,000 bbls/day (±10%), but that it had declined to 53,000 bbls/day (±10%) by the time the well had been capped on July 14, 2010.[70]

Another document released on August 4, 2010, the *Deepwater Horizon MC252 Gulf Incident Oil Budget*, provides some additional details, but none concerning the data upon which the June 15, 2010 estimate was based. It notes only that the "[g]overnment estimate of discharge ranged from 62,200 bbl[/day] on April 22, 2010 to 52,700 bbl[/day] on July 14, 2010."[71]

We now understand that Secretary Chu's team calculated the 52,700 bbls/day figure by taking pressure readings on July 14, 2010 using a sensor inside the capping stack that eventually stopped the flow of oil entirely. Before all of the valves on the stack had been closed, the sole channel for flow into the Gulf was an opening in the capping stack's kill line. Pressure readings from inside that line, along with some other data points, allowed the government to generate a flow-rate estimate with an uncertainty of plus or minus ten percent.[72]

Once the capping stack was closed on July 15, 2010, the pressure from the reservoir was about 2,000 psi lower than anticipated, signaling that it had decreased by that amount during the spill. Using this information, and modeling backwards using the Woods Hole team's May 31, 2010 figures, Secretary Chu's team arrived at an estimate of 62,200 bbls/day for the first day of the spill, based on the Woods Hole finding that 43.7% of the total flux was oil.[73] Given the new figures, the *Deepwater Horizon MC252 Gulf Incident Oil Budget* concluded that the total amount of oil discharged during the spill was 4,928,100 (± 10%, which gives a range of 4,435,290 to 5,420,910 total barrels), a number not reduced by the amount of oil captured at the wellhead via the Riser Insertion Tube Tool and Top Hat.[74]

The Flow Rate Group is presently compiling more information on the flow rate and total amount of oil discharged, with the intention of generating a peer-reviewed paper. Release of this paper will allow for a better assessment of the Group's work and value. It is worth noting now, however, that the Flow Rate Group's working estimates were significantly low, and that the best

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[68] NOAA Document.
[69] Interview with government official.
[70] Press Release, Deepwater Horizon Incident Joint Information Center, U.S. Scientific Teams Refine Estimates of Oil Flow from BP's Well Prior to Capping (Aug. 2, 2010), http://app.restorethegulf.gov/go/doc/2931/840475/.
[71] OIL BUDGET at 1.
[72] Interview with government official.
[73] *Id.*
[74] *Id.*

available data on flow rate were collected and analyzed by Secretary Chu's team and the Woods Hole team.[75]

Suggestions for the Commission's Consideration:

- The Flow Rate Group may be a valuable model for integration of outside scientific expertise. However, the Commission may wish to recommend a review of why the Group's estimates were inaccurate. The Commission may also want to consider whether scientific working groups such as the Flow Rate Group should disclose more of their underlying data and methodologies, allowing for greater input from the rest of the scientific community.

D. Final Government Estimate Versus Estimates of Independent Scientists

The flow-rate estimates of nongovernmental scientists, generated since the well was capped, are useful in assessing the accuracy and durability of the government's current figures.

In a peer-reviewed paper to be published on September 23, 2010, Dr. Timothy Crone and Dr. Maya Tolstoy of Columbia University's Lamont-Doherty Earth Observatory describe their total estimate of the flow from the Macondo well. Using the Optical Plume Velocimetry method referenced above, they conclude that, from April 22, 2010 until the riser was cut on June 3, 2010, the flow rate was 55,900 bbls/day (±21%); and that between June 3 and July 15, 2010, when the well was capped, the flow was 67,500 bbls/day (± 19%).[76] Crone and Tolstoy estimate the total release to be 5,174,887 barrels (± 20%).[77] Their calculations assume that oil represents 40% of the total flux from the well and do not include oil that was released from the kink leak prior to the riser cut on June 3, 2010.[78] If the kink leak were taken into account, and the oil ratio was increased to the 43.7% figure generated by the Woods Hole team, this estimate would be on the high end of the government's current estimate for the total release.

The Woods Hole team also generated an estimate for the total flow from the well.[79] On May 31, 2010, with the aid of the Coast Guard, Woods Hole took readings from the end of the broken riser and kink leak. The measurements at each site were taken using an ROV-mounted

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[75] On September 16, 2010, Public Employees for Environmental Responsibility (PEER), an environmental whistleblower group, filed a complaint in the U.S. District Court for the District of Columbia under the Freedom of Information Act seeking to compel the U.S. Geological Survey to produce documents related to the Flow Rate Group. PEER requested these records "in order to learn about how the [U.S. Geological Survey] and the [Flow Rate Group] developed a scientific estimate of the rate of oil leaking from the BP Deepwater Horizon blowout in the Gulf of Mexico." Complaint at 2, Pub. Emp. for Envtl. Responsibility v. Dep't of Interior (D.D.C. filed Sept. 16, 2010).

[76] Telephone Interview with Dr. Crone (Aug. 18, 2010 and Sept. 3, 2010).

[77] *Id*

[78] *Id*

[79] Woods Hole was originally contacted by BP on May 1, 2010 to undertake diagnostic work on the failed BOP, which would include measuring the flow rate. BP, however, cancelled the project, citing a need to focus on the containment dome effort. *Sizing up the BP Oil Spill: Science and Engineering Measuring Methods*, Briefing Before the Subcomm. on Energy and Environment of the H. Comm. on Energy and Commerce, 111th Cong. (May 19, 2010) (testimony of Dr. Richard Camilli).

acoustic Doppler current profiler to determine velocity, and imaging multi-beam sonar to determine flow volume.[80]

Following the Flow Rate Group's press release on June 10, 2010, the Woods Hole team refined its data and factored in the assumption that oil accounted for 43.7% of the total flux. With this new assumption, the team concluded that, on May 31, 2010, the riser was leaking at 40,700 bbls/day and the kink was leaking at 18,500 bbls/day, for a total flow of 59,200 bbls/day.[81] Using the flow rate of 53,000 bbls/day for July 14, 2010 generated by Secretary Chu's team, the Woods Hole team calculated the declining flow rate over time, from April 22 to July 14, 2010. The team estimated a total release of approximately five million barrels during the course of the spill.

The emerging consensus is that roughly five million barrels of oil were released by the Macondo well, with roughly 4.2 million barrels pouring into the waters of the Gulf of Mexico. Using different methods, Secretary Chu's team and independent scientists arrived at the same approximate figure.

Suggestions for the Commission's Consideration:

- The Commission may wish to recommend the technology and/or methods used by the Woods Hole team as a best practice going forward, if flow rate has to be determined rapidly in the absence of accurate pressure readings.

II. THE FATE OF THE OIL RELEASED

The second Part of this draft staff working paper describes the background to, and controversy surrounding, the "fate of the oil" released into the Gulf of Mexico during the Deepwater Horizon spill. On August 4, 2010, the government released an Oil Budget providing figures for the amounts of oil captured at the wellhead, burned, skimmed, evaporated or dissolved, chemically dispersed, and naturally dispersed. An important question for the Commission is whether that document created—by design or not—a misleading impression that the "fate of the oil" was clear, and that the large majority of oil was "gone."

Section A briefly describes the background to the Oil Budget and its rollout by the Obama administration. Section B outlines the Oil Budget's limitations, which may have been obscured in that rollout. Section C discusses the early reaction to the Oil Budget. Finally, Section D summarizes ongoing scientific research related to the fate of the oil, which suggests that whether spilled oil in the Gulf of Mexico is gone or still lingering below the surface remains unclear.

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[80] RICHARD CAMILLI, PRELIMINARY REPORT FROM THE WHOI FLOW RATE MEASUREMENT GROUP; Interview with Dr. Richard Camilli and Dr. Christopher Reddy, Woods Hole Oceanographic Institution, Washington, D.C. (Aug. 19, 2010); Telephone Interview with Dr. Camilli. (Sept. 10, 2010).

[81] Interview with Dr. Camilli and Dr. Reddy (Aug. 19, 2010); Telephone Interview with Dr. Camilli (Sept. 10, 2010).

A. Overview of the Oil Budget

1. History of the Budget Tool

The Oil Budget began as an operational tool for responders to target their efforts and to assess the effectiveness of skimming, burning, dispersants, and other response techniques. In the days immediately following the sinking of the Deepwater Horizon, the Coast Guard relied on a simple Microsoft Excel spreadsheet to evaluate the ongoing success of the response.[82] As the complexity and scale of the Deepwater Horizon spill became apparent, however, Coast Guard leadership needed a more advanced tracking tool to monitor the discharged oil.[83] On June 11, 2010, the National Incident Command requested the creation of a tool with the ability to document the efficacy of all skimming, burning, source capture, and dispersant application activities, as well as the volume of oil persisting in the ecosystem.[84] Experts from NOAA, the National Institute of Standards and Technology, and the United States Geological Survey formed the Oil Budget Calculator Science and Engineering Team (Oil Budget Team) to develop the tool, using flow rate data from the Flow Rate Group.[85]

The Oil Budget Team's tool was ready for use by July 6, 2010.[86] From that point on, Coast Guard personnel would enter daily data on dispersant use, oily water skimmed, and oil burned. The budget tool produced reports detailing the daily and cumulative results of the response efforts, as well as the volume of oil that remained.[87]

2. Fate of the Oil Estimates

On August 4, 2010, the Oil Budget Team released *Deepwater Horizon MC252 Gulf Incident Oil Budget* (*Gulf Incident Oil Budget*)[88] and a supporting document entitled *BP Deepwater Horizon Oil Budget: What Happened to the Oil* (*What Happened to the Oil*) (collectively, the Oil Budget).[89] The Oil Budget provided the first public estimate of the amount of oil discharged over the course of the spill (April 22 to July 14, 2010), a total of 4,928,100 barrels (±10%, which gives a range of 4,435,290 to 5,420,910 total barrels). The documents also provided an assessment of the fate of the spilled oil, as depicted in Figure 1 below:

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[82] JANE LUBCHENCO ET AL., BP DEEPWATER HORIZON OIL BUDGET: WHAT HAPPENED TO THE OIL? 5 [hereinafter WHAT HAPPENED TO THE OIL?] (Aug. 4, 2010), *available at* http://www.deepwaterhorizonresponse.com/posted/2931/Oil_Budget_description_8_3_FINAL.844091.pdf; U.S. Geological Survey Document.

[83] U.S. Geological Survey Document.

[84] Interview with government officials.

[85] U.S. Geological Survey Document; interview with government officials; *Oil Budget Q&A 8.4.10*, U.S. GEOLOGICAL SURVEY 1, http://www.usgs.gov/foia/budget/08-04-2010...FW-%20FINAL%20Tps%20and%20Q&A%20on%20%20Oil%20Budget.pdf. Though outside scientists reviewed the Oil Budget Team's assumptions and methodologies, the tool underwent no formal peer review process.

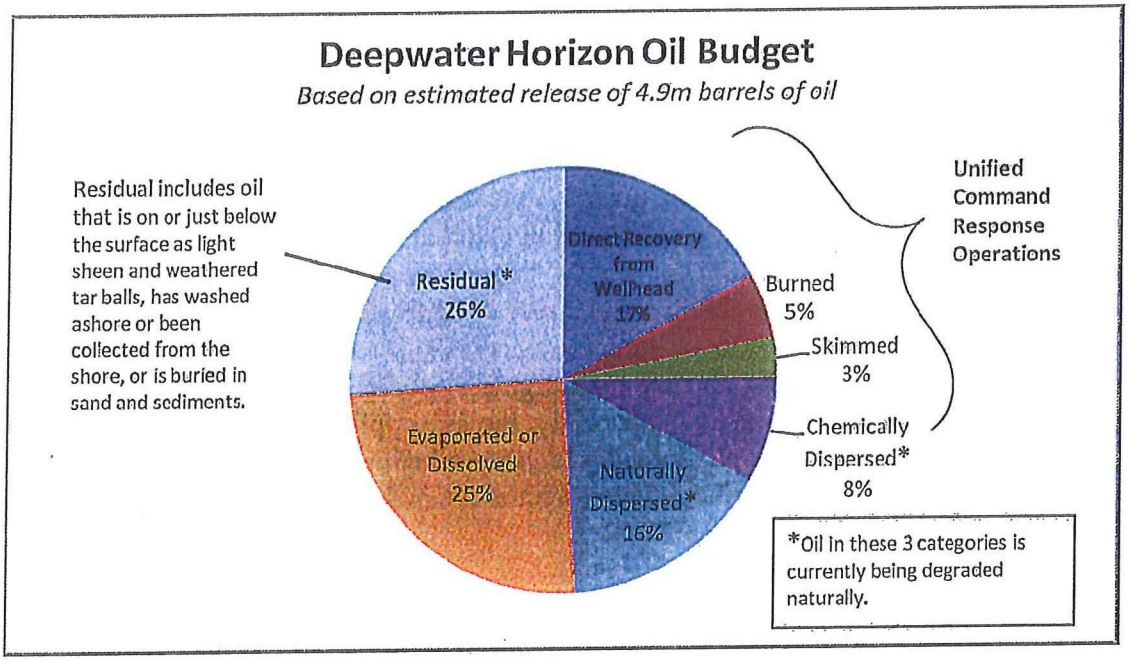
[86] Interview with government official.

[87] U.S. Geological Survey Document.

[88] OIL BUDGET.

[89] WHAT HAPPENED TO THE OIL?

Figure 1



The Oil Budget accounted for 100% of the spilled oil by classifying all of the oil into one of the following seven categories:

1. **Direct Recovery from Wellhead** (17%): Calculated by aggregating the amount of oil siphoned from the source through methods such as the Riser Insertion Tube Tool and Top Hat.

2. **Burned** (5%): Calculated using the American Society for Testing Materials burn rate standards, with differing rates for non-emulsified and emulsified oil.

3. **Skimmed** (3%): Calculated by taking the total amount of oily water collected multiplied by a factor that represents an estimate of the average oil content of the mixture.

4. **Chemically Dispersed** (8%): Calculated based on the amount of chemical dispersants applied at the source and on the surface. ("Dispersed" oil is defined as oil droplets smaller than 100 microns.) The calculation assumes an oil-to-dispersant ratio of 20:1, based on an international standard. The subsea application of dispersants is, however, believed to be more efficient, possibly resulting in a ratio of 50:1 to 75:1.[90] If these

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[90] Letter from Doug Suttles, Chief Operating Officer for Exploration and Production, BP, to Rear Admiral James Watson, Federal On-Scene Coordinator (July 11, 2010), *available at* http://www.deepwaterhorizonresponse.com/external/content/document/2931/780047/1/071110.PDF; Katie Peek, *How do Oil Dispersants Work?*, POPSCI (May 28, 2010), http://www.popsci.com/science/article/2010-05/how-do-oil-dispersants-work.

higher subsea ratios are correct, more oil may have been chemically dispersed than is accounted for in the 8% figure.

5. **Naturally Dispersed** (16%): Calculated by taking the total amount of oil, subtracting the estimate for subsurface chemical dispersion, and then multiplying the remainder by an estimated factor for "natural dispersion," which represents the process by which some oil coming out of the riser at high speed is sprayed off into small droplets.

6. **Evaporated or Dissolved** (25%): Calculated by applying a baseline evaporation and dissolution rate to the amount of oil released, which is then adjusted to take into account capture of oil at the source, burning activities, and subsea dispersion (while dissolution is included in the evaporation formula). A higher rate is applied to oil released within the past 24 hours than to older oil. Apparently, the rate applied takes into account varying surface conditions and the process by which the oil rises to the surface.[91] Although the normal evaporation rate for Louisiana sweet crude is 40-50%, the budget applies a lower rate.[92]

7. **Residual** (26%): The remainder once all oil accounted for in the other categories is subtracted from the total amount released from the well. Also described in the government reports as oil "remaining."[93] The Oil Budget Team contemplated using the label "other," but decided against so doing.[94] *What Happened to the Oil* notes that the residual category "includes oil still on or just below the surface in the form of light sheen or tar balls, oil washed ashore or been collected [sic] from the shore, and oil buried in sand and sediments that may resurface through time."[95]

3. The Rollout of the Budget

The unveiling of the Oil Budget coincided with Admiral Allen's announcement that the "static kill" effort had succeeded. On the morning of August 4, 2010, the Director of the White House Office of Energy and Climate Change Policy, Carol Browner, appeared on the *ABC* and *CBS* morning shows to discuss the success of the static kill effort and the conclusions of the Oil Budget Team.[96]

Ms. Browner did not describe the Oil Budget as an operational tool designed to assist responders. Instead, some of her statements presented the budget as a scientific assessment of how much of the oil was "gone":

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[91] Interview with government official.
[92] *Id.*; *see also* Justin Gillis, *U.S. Finds Most Oil From Spill Poses Little Additional Risk*, N.Y. TIMES (Aug. 4, 2010).
[93] OIL BUDGET.
[94] Interview with government officials.
[95] OIL BUDGET.
[96] Subsequent news media reports raised questions about this timing, including the possibility that political pressures within the White House might have prompted a premature release. *See* Dan Froomkin, *Questions Mount About White House's Overly Rosy Report On Oil Spill*, HUFFINGTON POST (Aug. 20, 2010), http://www.huffingtonpost.com/2010/08/20/overly-rosy-report-on-oil_n_688142.html.

- "I think it's also important to note that our scientists have done an initial assessment, and more than three-quarters of the oil is gone. The vast majority of the oil is gone."[97]

- "The scientists are telling us about 25 percent was not captured or evaporated or taken care of by mother nature."[98]

Subsequent headlines on August 4, 2010 reflected these characterizations: "75 percent of spilled Gulf oil gone, White House says."[99] The Oil Budget Team's findings, however, did not support the claim that 75% of the oil was "gone." The 75% that was not in the "remaining" category included oil that was "dispersed" and potentially in the process of being biodegraded but not "gone." At least some of Ms. Browner's public statements did not account fully for the actual findings in the budget.[100]

The Oil Budget rollout continued on the afternoon of August 4, 2010 with a White House press briefing attended by Ms. Browner, White House Press Secretary Robert Gibbs, Admiral Thad Allen, and NOAA Administrator Dr. Jane Lubchenco. At the briefing, the speakers again discussed the success of the static kill and the findings of the Oil Budget Team. Administrator Lubchenco and Ms. Browner emphasized that the report was "peer-review[ed]" by federal and non-federal scientists.[101] These references to peer review by two senior officials in a White House press briefing likely contributed to the public perception of the budget's findings as more exact than the operational tool that produced them was designed to be.

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[97] Robert Farley, *Carol Browner Says Three-Quarters of the Oil Spilled in the Gulf is Gone*, ST. PETERSBURG TIMES (Aug. 16, 2010), http://www.politifact.com/truth-o-meter/statements/2010/aug/16/carol-browner/carol-browner-says-three-quarters-oil-spilled-gulf/.

[98] AFP, *75 Percent Oil From Gulf of Mexico Spill is Gone: Official*, GOOGLE NEWS (AUG. 4, 2010), http://www.google.com/hostednews/afp/article/ALeqM5h1qkjFdSvSOH6qmoXacsi4EtgmjQ.

[99] The Associated Press, *Oil Well Plugged with Mud, BP Says; 75 Percent Spilled Gulf Oil Gone, White House Says*, TIMES-PICAYUNE (Aug. 4, 2010), http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/08/oil_well_plugged_with_mud_bp_s.html; *see also, e.g.*, Jim Polson & Allison Bennett, *'Vast Majority' of Oil Gone From Gulf, Browner Says*, BLOOMBERG (Aug. 4, 2010); Farley, *Carol Browner Says Three-Quarters of the Oil Spilled in the Gulf is Gone*; AFP *75 Percent Oil From Gulf of Mexico Spill is Gone: Official*; David Jackson, *Obama Aide on Gulf Spill: 'No Oil is Leaking,'* THE OVAL, USA TODAY (AUG. 4, 2010), http://content.usatoday.com/communities/theoval/post/2010/08/obama-aide-on-gulf-no-oil-is-leaking/1.

[100] Renee Schoof, *NOAA Head: Scientists' Work on Gulf Spill Far From Done*, MCCLATCHY NEWSPAPERS (Sept. 15, 2010), http://www.mcclatchydc.com/2010/09/15/100645/noaa-head-scientists-work-on-gulf.html?storylink=MI_emailed.

[101] White House Press Briefing, Robert Gibbs, Admiral Thad Allen, Carol Browner, and NOAA Administrator Jane Lubchenco, Washington, D.C. (Aug. 4, 2010), http://www.whitehouse.gov/the-press-office/press-briefing-press-secretary-robert-gibbs-admiral-thad-allen-carol-browner-and-dr (Lubchenco: "The report was produced by scientific experts from a number of different agencies, federal agencies, with peer review of the calculations that went into this by both other federal and non-federal scientists."; Browner: "This has all been—as Dr. Lubchenco said—been subjected to a scientific protocol, which means you peer review, peer review and peer review.").

B. The Oil Budget's Shortcomings

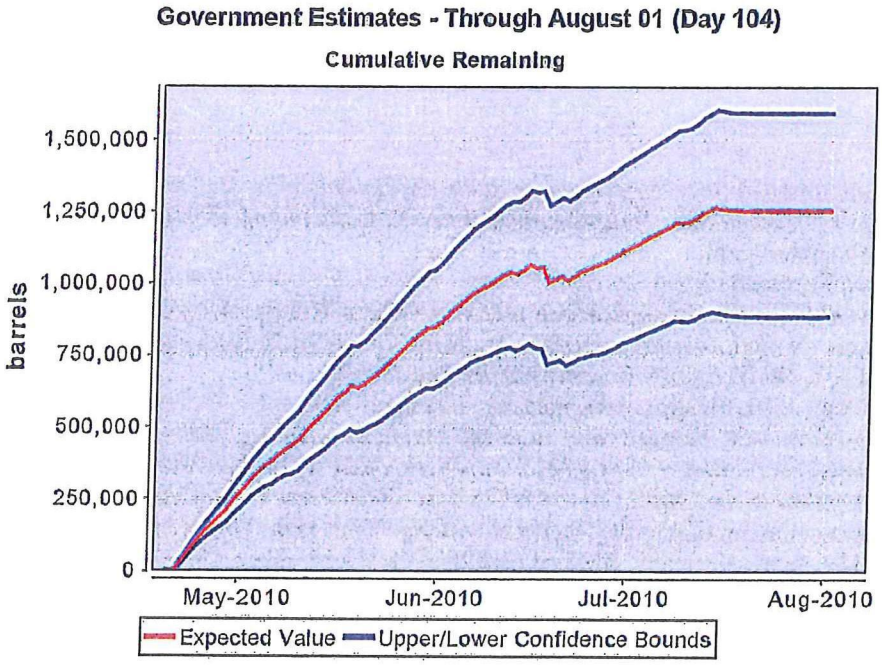
The Oil Budget was never meant to be a precise tool, and its rollout as a scientific report obscured some important shortcomings.

First, perhaps because the Oil Budget was originally intended for responders rather than for public evaluation, it did not disclose the formulas and assumptions upon which its estimates were based. Of the seven categories in which it provided estimates, "direct recovery" was the only one based on direct measurements. The Oil Budget Team built its assessment of the fate of the other 83% of the oil—roughly 4.1 million barrels—on unreleased formulas. It also presented estimates for those categories as fixed numbers or percentages, without attendant confidence intervals.

Second, and more important, the Oil Budget was simply not designed to explain, or capable of explaining, the "fate of the oil." Its purpose was to tell responders how much oil was present for clean-up operations, not to tell the public how much oil was still in Gulf waters. Thus, it did not attempt to quantify biodegradation, or the exact amounts of subsurface, dissolved, and dispersed oil, which were not the targets of response actions.

One of the report's graphs (*see* Figure 2 below) illustrates that biodegradation was not a component of the budget. The amount of oil is depicted as constant following the July 14, 2010 well capping:

Figure 2



The Oil Budget's failure to account for biodegradation could result in over- or under-estimation of the amount of oil remaining in Gulf waters. On the one hand, oil that the budget classified as "dispersed," "dissolved," or "evaporated" is not necessarily gone. Dispersed or dissolved oil may still be present in the water, and even evaporated oil is in the atmosphere. As

Administrator Lubchenco has stated, "dispersed or diluted doesn't necessarily mean benign."[102] On the other hand, oil that the budget classified as "remaining" is not necessarily still present, as some portion may have already biodegraded. That category might have been better described as "other"—oil not included in any of the other categories. The *What Happened to the Oil* document did discuss the biodegradation issue, noting that "[o]il in the residual and dispersed categories is in the process of being degraded," and referencing early indications that the oil is "biodegrading quickly."[103] But because the Oil Budget did not provide sources or data to support this claim, or define "quickly," this note seemed to increase, rather than address, public confusion about whether and how the budget demonstrated that most of the oil was "gone."

C. Early Reactions to the Oil Budget

The Oil Budget received immediate criticism. Critics focused on Ms. Browner's and Administrator Lubchenco's statements that the report had been peer-reviewed; on the decision to present the findings as fixed numbers rather than ranges, without disclosure of the underlying formulas;[104] and on the claim that the oil was "biodegrading quickly."[105] Scientists argued that the report painted a misleadingly optimistic picture of the situation in the Gulf, presenting uncertain information as fact.[106]

The criticism that the Oil Budget was not a peer-reviewed scientific report—despite the suggestions to the contrary from Ms. Browner and Administrator Lubchenco—was plainly correct. Even the independent scientists that Ms. Browner and Administrator Lubchenco described as peer reviewers were critical of the report and the way it was presented. According to the *What Happened to the Oil* document, these scientists "consulted on the oil budget calculations, contributed field data, suggested formulas, analysis methods, or reviewed the algorithms used in the calculator."[107] When interviewed, many of these scientists described their contributions in similar terms, but they emphasized the large degree of uncertainty in their work and their impression that they were assisting in the development of an operational tool rather than a public government report.[108] Indeed, it is unclear whether any of the consulting scientists

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[102] Schoof, *NOAA Head: Scientists' Work on Gulf Spill Far From Done*; *see also* White House Press Briefing (Aug. 4, 2010) (explanation by Administrator Lubchenco that dispersed and dissolved oil are "pretty comparable").

[103] WHAT HAPPENED TO THE OIL?

[104] For example, Representative Edward Markey (D-Massachusetts) asserted that the formulas and assumptions underlying the Oil Budget should have been made public at the same time as the findings, to permit independent verification. Katie Howell, *White House, Critics Reach Stalemate in Dispute Over Oil Budget in Gulf*, N.Y. TIMES (Aug. 23, 2010).

[105] David A. Fahrenthold, *Scientists Question Government Team's Report of Shrinking Gulf Oil Spill*, WASH. POST (Aug. 5, 2010); *see also* Howell, *White House, Critics Reach Stalemate in Dispute Over Oil Budget in Gulf.*

[106] *See, e.g.*, Fahrenthold, *Scientists Question Government Team's Report of Shrinking Gulf Oil Spill* (Quoting Dr. Ian MacDonald who stated that "[The *Oil Budget*] seems very reassuring, but the data aren't there to actually bear out the assurances that were made.").

[107] WHAT HAPPENED TO THE OIL?

[108] Dan Froomkin, *NOAA Claims Scientists Reviewed Controversial Report; The Scientists Say Otherwise*, THE HUFFINGTON POST (Aug. 20, 2010), http://www.huffingtonpost.com/2010/08/20/noaa-claims-scientists-re_n_689428.html; Kate Sheppard, *NOAA's Supposed Peer Reviewers: We Never Reviewed the Report*, MOTHER JONES (Aug. 20, 2010), http://motherjones.com/blue-marble/2010/08/was-noaa-report-independently-evaluated.

actually reviewed the final report prior to its release.[109] In the words of consulting expert Ed Overton, "[t]o a scientist, peer review means something . . . . Clearly it wasn't a peer review from a scientific perspective."[110]

The Administration has declined to make public the data underlying the Oil Budget before publication of a comprehensive report in mid-October.[111]

D. Subsequent Scientific Research

Scientific reports on the fate of the oil from the Macondo well have begun to emerge over the past two months. Some research has already been peer-reviewed and published; other research is more preliminary. The peer-reviewed studies generally focus on the location of dispersed oil and other hydrocarbons and the rate at which they are biodegrading.[112] Although different research teams appear to be providing pieces missing from the Oil Budget and the larger puzzle regarding the fate of the oil, their findings suggest that understanding where the oil went will be an incremental process.

1. An Underwater Plume

The first important peer-reviewed scientific paper—by Camilli, et al., released on August 19, 2010—focused on the discovery of an underwater plume of hydrocarbons.[113] While conducting research in the Gulf of Mexico between June 19 and 28, 2010, Camilli's Woods Hole team found a continuous plume of highly diffuse hydrocarbons 35 kilometers long, 200 meters high, and 2 kilometers wide, at a depth of approximately 1,100 meters.[114] After determining that the Macondo spill was the source of the plume, the group estimated that the plume likely extended beyond the 35 kilometer boundary of the study. The Woods Hole researchers also examined the biodegradation rate by analyzing oxygen drawdown within the plume. The team was unable to find evidence of "systematic oxygen drawdown," which suggested that rapid biodegradation might not be occurring.[115]

The release of this study attracted considerable media attention, with many outlets focusing on whether it supported the conclusions of the Oil Budget.[116] The authors of the study have tried to curtail this line of inquiry, describing the Oil Budget as a "first pass[]" that is part of a "foundation from which to work, road maps to use in assigning future research assets in

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[109] *Id.*

[110] Kate Sheppard, *NOAA's Supposed Peer Reviewers: We Never Reviewed the Report*, MOTHER JONES (Aug. 20, 2010), http://motherjones.com/blue-marble/2010/08/was-noaa-report-independently-evaluated.

[111] Interviews with government officials.

[112] Oil was not the only hydrocarbon released from the Macondo well. Natural gas represented up to 56.3% of the total discharge. Interview with Dr. Richard Camilli and Dr. Christopher Reddy, Woods Hole Oceanographic Institution, Washington, D.C. (Aug. 19, 2010); Telephone Interview with Dr. Camilli (Sept. 10, 2010).

[113] Richard Camilli at al., *Tracking Hydrocarbon Plume Transport and Biodegradation at* Deepwater Horizon, SCIENCE EXPRESS; at 1 (Aug. 19, 2010).

[114] *Id.* at 2.

[115] *Id.* at 3.

[116] Justin Gillis and John Collins Rudolf, *Oil Plume is Not Breaking Down Fast, Study Says*, N.Y. TIMES (Aug. 19 2010); Christopher Reddy, Op-Ed., *How Reporters Mangle Science on Gulf Oil*, CNN (Aug. 25, 2010), http://edition.cnn.com/2010/OPINION/08/25/reddy.science.media/index.html.

examining the transport and fate of oil in the Gulf of Mexico."[117] The Woods Hole study itself considered only one factor giving an indication of the biodegradation rate.

2. Further Work on Biodegradation

The next peer-reviewed paper to emerge, published on August 24, 2010 by Hazen, et al. and titled *Deep-Sea Oil Plume Enriches Indigenous Oil-Degrading Bacteria*, primarily focused on biodegradation of deep-sea plumes of hydrocarbons.[118] The Hazen team, researchers from Lawrence Berkeley National Laboratory, conducted their fieldwork between May 25, 2010 and June 2, 2010. Like the Woods Hole team, the Hazen team detected a subsea plume of hydrocarbons at a depth of 1,100-1,200 meters. Unlike Woods Hole, however, the team did find slight oxygen drawdown within the plume. The Hazen team also noted the type and density of the microbes in the plume and did laboratory tests to determine the biodegradation rate in terms of hydrocarbon half-life (1.2-6.1 days). Based on their findings, the researchers concluded that microbes were rapidly adapting in response to the presence of the subsea plume, and that the biodegradation rates for hydrocarbons were "faster than expected."[119] While Hazen's research suggests a faster biodegradation rate than Camilli's, both scientists have stated that their studies are complementary.[120] Both found deep sea plumes of hydrocarbons, with Hazen using different, more varied methods to estimate biodegradation.[121]

A third study related to biodegradation was produced by the National Incident Command's Joint Analysis Group on August 16, 2010 and found depressed, but not hypoxic, oxygen levels at the site of the Macondo well.[122] The group's study, conducted between May 8 and August 9, 2010, noted reduced oxygen levels at depths of 1,000 to 1,400 meters, which they interpreted as consistent with the presence of hydrocarbons from the Macondo well.[123] They did not find that oxygen drawdown was increasing over time. Their report concluded that oxygen levels were not decreasing because the oxygen depleted by biodegradation (as found by Hazen, et al.) was being replenished through the mixing of plume water with surrounding waters.[124]

3. The Fate of All Hydrocarbons

The most recent peer-reviewed paper on the subject, *Propane Respiration Jump-Starts Microbial Response to a Deep Oil Spill*, was published on September 16, 2010 by Valentine, et

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[117] *Id.*
[118] Terry C. Hazen et al., *Deep-Sea Oil Plume Enriches Indigenous Oil-Degrading Bacteria*, SCIENCE EXPRESS, at 1 (Aug. 24, 2010).
[119] *Id.*
[120] Deborah Zabarenko, *Microbes Ate BP Oil Deep-Water Plume: Study*, REUTERS (Aug. 24, 2010), http://www.reuters.com/article/idUSTRE67N5CC20100824.
[121] *Id.*
[122] JOINT ANALYSIS GROUP, REVIEW OF PRELIMINARY DATA TO EXAMINE OXYGEN LEVELS IN THE VICINITY OF MC252#1, (Aug. 16, 2010), *available at* http://ecowatch.ncddc.noaa.gov/JAG/files/JAG_Oxygen_Report%20FINAL%20090410.pdf.
[123] *Id.* at 7.
[124] *Id.* at 8.

al. and focused on the fate of all hydrocarbons rather than just oil.[125] Conducted from June 11-21, 2010, the study found subsea plumes in the vicinity of the Macondo well that included high concentrations of natural gas. To analyze biodegradation rates, the team looked at oxygen drawdown, as well as several other factors to determine which forms of hydrocarbons were being degraded.[126] They concluded that approximately two thirds of the biodegradation of deep plumes involve the metabolism of natural gas, rather than oil.[127]

Valentine's study thus suggests that only a fraction of subsea oil is being biodegraded, causing the plume to change in composition.[128] If those findings are correct, much of the biodegradation found by the Hazen team may involve natural gas, rather than oil. Additional research may be necessary to understand how biodegradation will proceed as natural gas makes up a decreasing proportion of the subsea plumes.

4. Current Research

In addition to these published studies, the media has reported on a number of ongoing field studies and their preliminary findings. Dr. Samantha Joye, a professor of Marine Sciences at the University of Georgia,[129] is currently taking sediment samples in the Gulf of Mexico and has found a layer of oily substance up to two inches thick covering the ocean floor in the region of the Macondo well.[130] Dr. Joye thinks the layer is fresh because recently deceased shrimp, worms, and other sea life lie below it.[131] While Dr. Joye has yet to confirm that the oil comes from the Macondo well, she has voiced her belief that what she found is likely dispersed subsurface oil from the spill.[132]

Similarly, a team from the University of South Florida (USF) found oil droplets in marine sediment in the DeSoto Canyon, an underwater fissure that runs from the Macondo site towards

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[125] David L. Valentine et al., *Propane Respiration Jump-Starts Microbial Response to a Deep Oil Spill*, SCIENCE EXPRESS, at 1 (Sept. 16, 2010).
[126] *Id.* at 1.
[127] *Id.*
[128] 128: Telephone Interview with Dr. Richard Camilli, Woods Hole Oceanographic Institution (Sept. 15, 2010).
[129] Dr. Joye is also part of the Georgia Sea Grant, an "ad hoc group of university-based oceanographic experts" that released a report criticizing the Oil Budget on August 17, 2010. Georgia Sea Grant, *Outcome/Guidance from Georgia Sea Grant Program: Current Status of BP Oil Spill* (Aug. 17, 2010), http://uga.edu/aboutUGA/joye_pkit/GeorgiaSeaGrant_OilSpillReport8-16.pdf. Based largely on the figures in the Oil Budget, but using different methodologies and assumptions, the report estimated that a full 70-79% of the 4.1 million barrels of oil released into Gulf waters was still remaining at the time of publication. The report attempted to account for biodegradation, using an estimate of 5%-10% based on data from earlier spills The Georgia Sea Grant report has been criticized as based upon insufficient data and for underestimating the rate of biodegradation. *See, e.g.*, John Collins Rudolph, *Scientists Tussle Over Gulf Oil Tally*, N.Y. TIMES (Aug. 17, 2010), http://green.blogs.nytimes.com/2010/08/17/tussle-over-gulf-oil-tally-drags-on/.
[130] Cain Burdeau and Seth Bornstein, *Where's the Oil? On the Gulf Floor, Scientists Say*, ST. PETERSBURG TIMES (Sept. 13, 2010); Richard Harris, *Scientists Find Thick Layer of Oil on Seafloor*, NATIONAL PUBLIC RADIO (Sept. 10, 2010), http://www.npr.org/templates/story/story.php?storyId=129782098; Samantha Joye, *Focusing in on Oil*, GULF OIL BLOG (Sept. 5, 2010), http://gulfblog.uga.edu/2010/09/focusing-in-on-oil/.
[131] Harris, *Scientists Find Thick Layer Of Oil On Seafloor.*
[132] *Id.*; Burdeau and Bornstein, *Where's the Oil? On the Gulf Floor, Scientists Say.*

the coast of Florida.[133] Although this research took place from August 6-16, 2010, the researchers have not confirmed that the droplets are from the Macondo well.[134] One of the researchers involved has noted that their findings are preliminary and should not "get misconstrued as scientific fact."[135]

The early reports from Dr. Joye and the USF team may corroborate the anecdotal evidence of oil sightings still coming from the Gulf.[136] The researchers appear to be publicizing their work in part to highlight that the oil spilled is not gone.[137] Perhaps as a partial result of these early findings, government officials have changed the tone of their public statements on the fate of the oil. For example, on September 15, 2010, Administrator Lubchenco acknowledged that oil is being found on the seafloor and promised that the government "will continue to monitor, sample and study the oil and [dispersants] from the near shore to the open ocean, from the surface to the seafloor . . . mindful of the need to understand how much oil remains, where it is and in what concentrations and how rapidly it's being naturally degraded."[138] It is currently being reported that NOAA will lead an extensive study, including independent and government scientists, aimed at better understanding how much oil remains in the Gulf and its impacts on the marine ecosystem.[139]

Suggestions for the Commission's Consideration:

- The administration's suggestions that that the Oil Budget was a "peer-review[ed]" scientific report, and that it concluded 75% of the oil was "gone," were inaccurate and led to news reports that were misleading. In fact, the Oil Budget was a rough operational tool, and its findings were neither as clear nor as reassuring as the initial rollout indicated.

- As with the Flow Rate Technical Group, the Commission may wish to consider recommendations that government scientific study groups disclose more of their underlying methodologies, assumptions, and data, allowing for greater review and input from the rest of the scientific community.

- It will likely take years to understand the true "fate of the oil" and its impacts on the Gulf of Mexico. The Subcommittee on Restoration: Impacts and Assessment will take up these critical issues.

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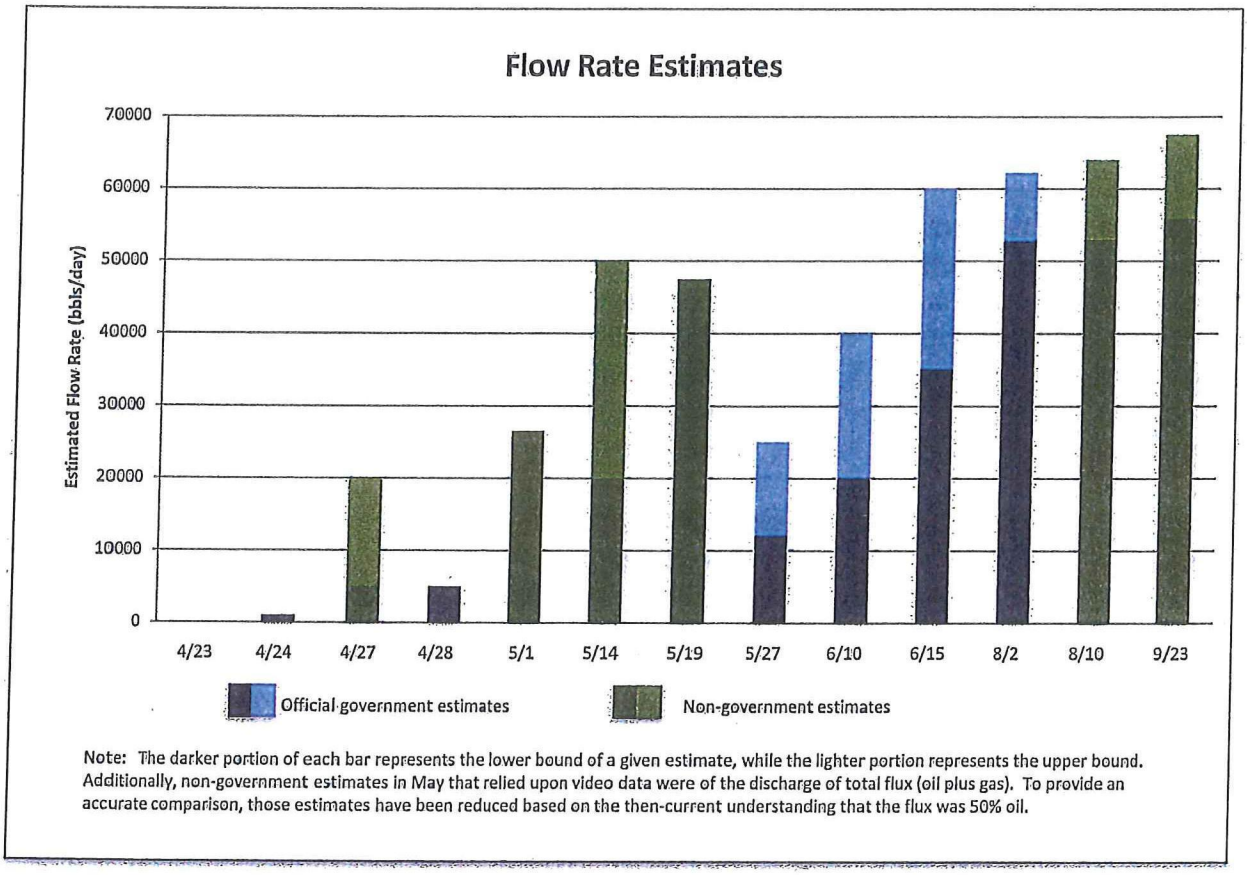
[133] Vickie Chachere, *USF Scientists Detect Oil on Seafloor*, UNIVERSITY OF FLORIDA NEWS SERVICE (Aug. 17, 2010), http://usfweb3.usf.edu/absoluteNM/templates/?a=2604&z=120.
[134] *Id.*
[135] Christine Dell'Amore, *Toxic Oil Found Deep on Gulf Seafloor?*, NATIONAL GEOGRAPHIC DAILY NEWS, Aug. 18, 2010, http://news.nationalgeographic.com/news/2010/08/100818-gulf-oil-spill-seafloor-toxic-science-environment/.
[136] *See, e.g.*, *Louisiana Authorities Report Oil Sightings from Gulf of Mexico Spill*, TIMES-PICAYUNE (Sept. 13, 2010).
[137] Burdeau and Bornstein, *Where's the Oil? On the Gulf Floor, Scientists Say.*
[138] Press Briefing and Teleconference, Admiral Thad Allen and NOAA Administrator Dr. Jane Lubchenco (Sept. 15, 2010), http://www.piersystem.com/go/doc/2931/898775.
[139] Editorial, *Science and the Gulf*, N.Y. TIMES (Sept. 13, 2010).

Appendix



Note: The darker portion of each bar represents the lower bound of a given estimate, while the lighter portion represents the upper bound. Additionally, non-government estimates in May that relied upon video data were of the discharge of total flux (oil plus gas). To provide an accurate comparison, those estimates have been reduced based on the then-current understanding that the flux was 50% oil.

BP Deepwater Horizon Oil Budget: What Happened To the Oil?

The National Incident Command (NIC) assembled a number of interagency expert scientific teams to estimate the quantity of BP Deepwater Horizon oil that has been released from the well and the fate of that oil. The expertise of government scientists serving on these teams is complemented by nongovernmental and governmental specialists reviewing the calculations and conclusions. One team calculated the flow rate and total oil released. Led by Energy Secretary Steven Chu and United States Geological Survey (USGS) Director Marcia McNutt, this team announced on August 2, 2010, that it estimates that a total of 4.9 million barrels of oil has been released from the BP Deepwater Horizon well. A second interagency team, led by the Department of the Interior (DOI) and the National Oceanic and Atmospheric Administration (NOAA) developed a tool called the Oil Budget Calculator to determine what happened to the oil. The calculator uses the 4.9 million barrel estimate as its input and uses both direct measurements and the best scientific estimates available to date, to determine what has happened to the oil. The interagency scientific report below builds upon the calculator and summarizes the disposition of the oil to date.

In summary, it is estimated that burning, skimming and direct recovery from the wellhead removed one quarter (25%) of the oil released from the wellhead. One quarter (25%) of the total oil naturally evaporated or dissolved, and just less than one quarter (24%) was dispersed (either naturally or as a result of operations) as microscopic droplets into Gulf waters. The residual amount — just over one quarter (26%) — is either on or just below the surface as light sheen and weathered tar balls, has washed ashore or been collected from the shore, or is buried in sand and sediments. Oil in the residual and dispersed categories is in the process of being degraded. The report below describes each of these categories and calculations. These estimates will continue to be refined as additional information becomes available.

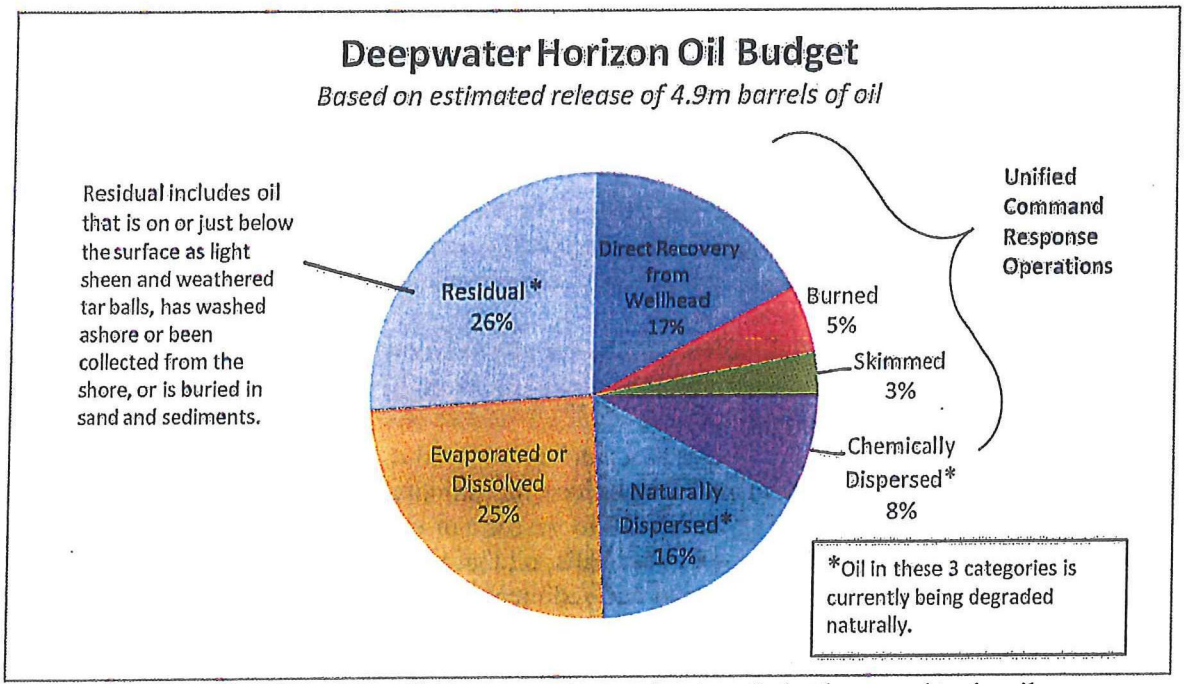


Figure 1: Oil Budget - Shows current best estimates of what happened to the oil.

Explanation of Findings

Unified Command Response Efforts: Response efforts to deal with the oil have been aggressive. As shown in the pie chart (Figure 1), response efforts were successful in addressing 33% of the spilled oil. This includes oil that was captured directly from the wellhead by the riser pipe insertion tube and top hat systems (17%), burning (5%), skimming (3%) and chemical dispersion (8%). Direct capture, burning and skimming remove the oil from the water entirely, while chemically dispersed oil remains in the water until it is biodegraded, as discussed below.

Dispersion: Based on estimates, 16% of the oil dispersed naturally into the water column and 8% was dispersed by the application of chemical dispersants on and below the surface. Natural dispersion occurs as a result of the oil coming out of the riser pipe at high speed into the water column, which caused some of the oil to spray off in small droplets. For the purpose of this analysis, 'dispersed oil' is defined as droplets that are less than 100 microns — about the diameter of a human hair. Oil droplets that are this small are neutrally buoyant and thus remain in the water column where they then begin to biodegrade. Chemical dispersion also breaks the oil up into small droplets to keep it from coming ashore in large surface slicks and makes it more readily available for biodegradation. Chemical dispersants were applied at the surface and below the surface; therefore, the chemically dispersed oil ended up both deep in the water column and just below the surface. Dispersion increases the likelihood that the oil will be biodegraded, both in the water column and at the surface. Until it is biodegraded, naturally or chemically dispersed oil, even in dilute amounts, can be toxic to vulnerable species.

All of the naturally dispersed oil and some of the oil that was chemically dispersed remained well-below the surface in diffuse clouds where it began to dissipate further and biodegrade. Previous analyses have shown evidence of diffuse clouds of dispersed oil between 3,300 and 4,300 feet in very low concentrations (parts per million or less), moving in the direction of known ocean currents and decreasing with distance from the wellhead. (citation: Federal Joint Analysis Group Report 1 and 2, http://ecowatch.ncddc.noaa.gov/JAG/reports.html). Oil that was chemically dispersed at the surface moved into the top 20 feet of the water column where it mixed with surrounding waters and began to biodegrade.

Evaporation and Dissolution: It is estimated that 25% of the oil volume quickly and naturally evaporated or dissolved into the water column. The evaporation and dissolution rate estimate is based on scientific research and observations conducted during the Deepwater Horizon incident.

Dissolution is different from dispersion. Dissolution is the process by which individual hydrocarbon molecules from the oil separate and dissolve into the water just as sugar can be dissolved in water. Dispersion is the process by which larger volumes of oil are broken down into smaller droplets of oil.

Residual: After accounting for the categories that can be measured directly or estimated (i.e., recovery operations, dispersion, and evaporation and dissolution), an estimated 26% remains. This figure is a combination of categories all of which are difficult to measure or estimate. It includes oil still on or just below the surface in the form of light sheen or tar balls, oil that has washed ashore or been collected from the shore, and some that is buried in sand and sediments and may resurface through time. This oil has also begun to degrade through natural processes.

Biodegradation: Dispersed oil in the water column and oil on the surface of the water biodegrade naturally. While there is more analysis to be done to quantify the rate of biodegradation in the Gulf, early observations and preliminary research results from a number of scientists show that the oil from the BP Deepwater Horizon spill is biodegrading quickly. Scientists from NOAA, EPA, DOE and academia are working to calculate more precise estimates of this rate. It is well known that bacteria that break down the dispersed and weathered surface oil are abundant in the Gulf of Mexico in large part because of the warm water, the favorable nutrient and oxygen levels, and the fact that oil regularly enters the Gulf of Mexico through natural seeps.

Explanation of Methods and Assumptions

Flow Rate: The Oil Budget Calculator starts with an estimate of the cumulative amount of oil released over the course of the spill. The newest estimates reflect the collaborative work and discussions of the National Incident Command's Flow Rate Technical Group (FRTG) led by United States Geological Survey (USGS) Director Marcia McNutt, and a team of Department of Energy (DOE) scientists and engineers, led by Energy Secretary Steven Chu. This group estimates that approximately 4.9 million barrels of oil flowed from the BP Deepwater Horizon wellhead between April 22 and July 15, 2010, at which time the flow of oil was suspended. The uncertainty of this estimate is $\pm$ 10%. The pie chart above is based on this group's estimate of 4.9 million barrels of oil.

Direct Measures and Best Estimates: The oil budget calculations are based on direct measurements wherever possible and the best available scientific estimates where measurements were not possible. The numbers for direct recovery and burns were measured directly and reported in daily operational reports. The skimming numbers were also based on daily reported estimates. The rest of the numbers were based on previous scientific analyses, best available information and a broad range of scientific expertise. These numbers will continue to be refined based on additional information and further analysis. Further information on these calculation methods is available in the Deepwater Horizon Gulf Incident Budget Tool Report from Aug 1, 2010 (available online). The tool was created by the US Geological Survey in collaboration with US Coast Guard, NOAA and NIST.

Continued monitoring and research:

Our knowledge of the oil, dispersants, ecosystem impacts and human impacts will continue to evolve. Federal agencies and many academic and independent scientists are actively pursuing better understanding of the fate, transport and impact of the oil. The federal government will continue to report activities, results and data to the public on a regular basis. Updates and information can be found at www.restorethegulf.gov, and data from the response and monitoring can be found at www.geoplatform.gov.

DOI, NASA and NOAA continue to refine understanding of amounts of remaining surface oil. NOAA responders are working with the Unified Command on monitoring strategies for tar balls and near shore submerged oil, and researchers continue subsurface scanning and sampling to monitor the concentration, distribution and impact of oil there. EPA and NOAA have carefully monitored BP's use of dispersant in the Gulf and continues to monitor the air, water and sediments near the shoreline for the presence of dispersant and crude oil components with special attention to human health impacts. Numerous NOAA- and NSF-funded academic researchers and NOAA scientists are investigating rates of biodegradation, ecosystem and wildlife impacts. DOI and DOE responders are working to ensure control of the well and

accurate measurement of oil released and oil remaining in the environment. DOI is leading efforts to mitigate impacts of oil to terrestrial wildlife, natural resources, and public lands.
Even though the threat to shorelines, fish and wildlife, and ecosystems has decreased since the capping of the BP wellhead, federal scientists remain extremely concerned about the impact of the spill to the Gulf ecosystem. Fully understanding the impacts of this spill on wildlife, habitats, and natural resources in the Gulf region will take time and continued monitoring and research.

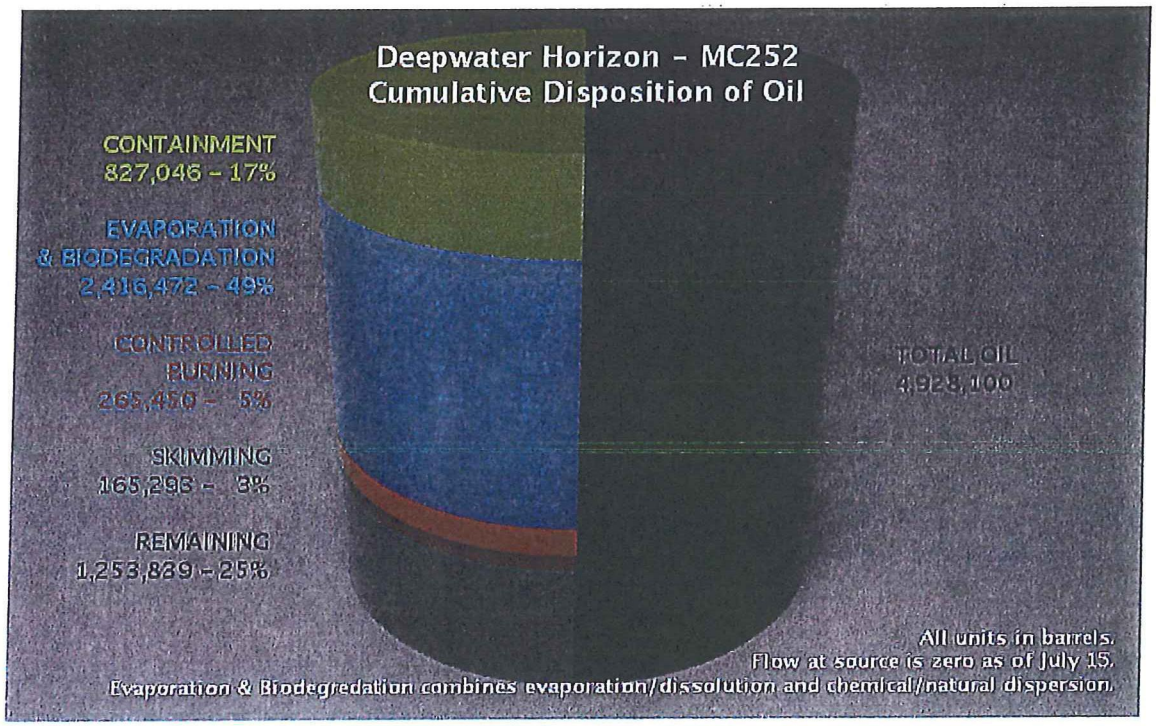
Deepwater Horizon MC252 Gulf Incident Oil Budget

Government Estimates - Through August 01 (Day 104)

	Cumulative	August 01
Discharged	4,928,100	0
Recovered via RITT and Top Hat	827,046	0
Dispersed Naturally	763,948	0
Evaporated or Dissolved	1,243,732	0
Available for Recovery	2,093,374	0
Chemically Dispersed	408,792	0
Burned	265,450	0
Skimmed	165,293	21
Remaining	1,253,839	-21
Dispersant Used	43,900	0
Inland Recovery (Cumulative)	35,818 tons	

* All unlabeled values in barrels. See end notes for assumptions.

** Government estimate of discharge ranged from 62,200 bbl on April 22, 2010 to 52,700 bbl on July 14, 2010.



Deepwater Horizon MC252 Gulf Incident Oil Budget

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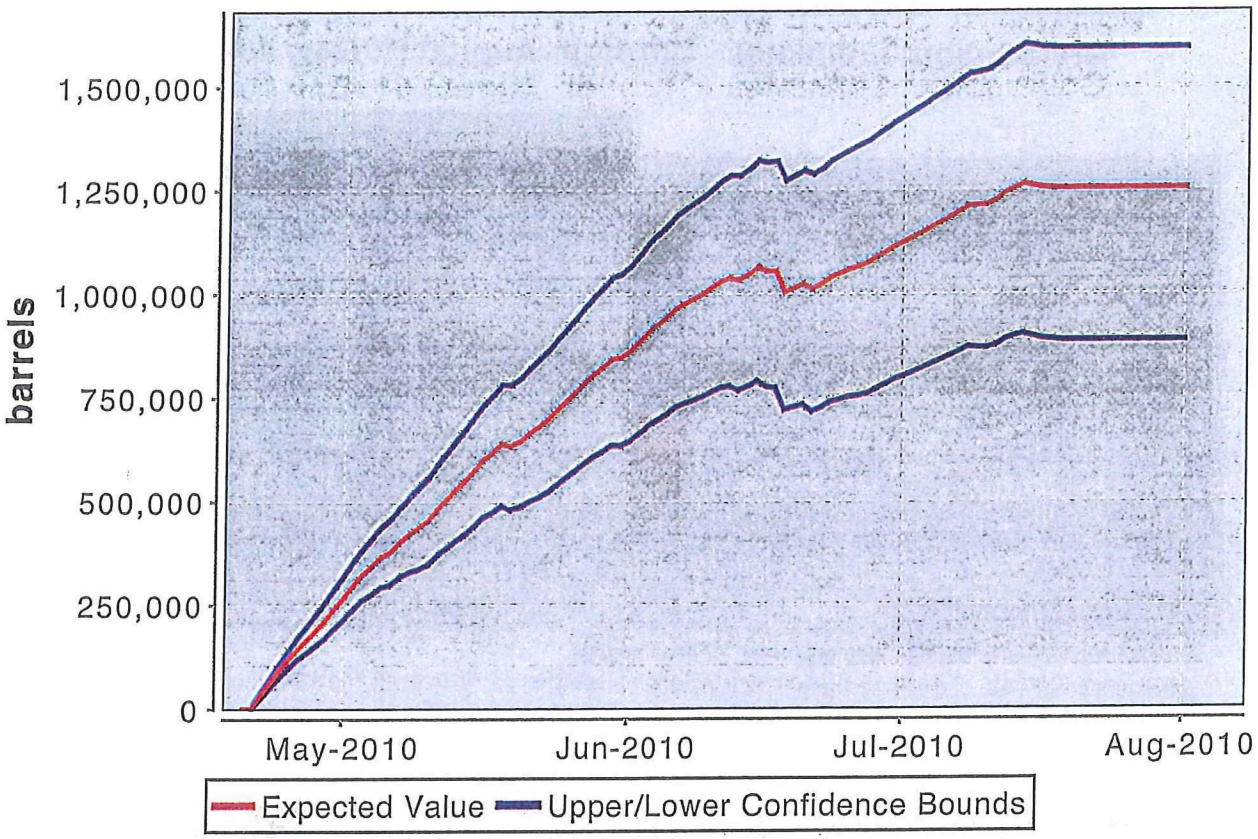
See end notes section of the report for reference material on report elements.

Application operated by the U.S. Coast Guard and provided by the U.S. Geological Survey in cooperation with the National Oceanic and Atmospheric Administration.

Government Estimates - Through August 01 (Day 104)

Cumulative Remaining



Deepwater Horizon MC252 Gulf Incident Oil Budget

Report generated by sbristol@usgs.gov on 08/02/2010 05:30 PM MDT.

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Application operated by the U.S. Coast Guard and provided by the U.S. Geological Survey in cooperation with the National Oceanic and Atmospheric Administration.

Deepwater Horizon MC252 Gulf Incident Oil Budget

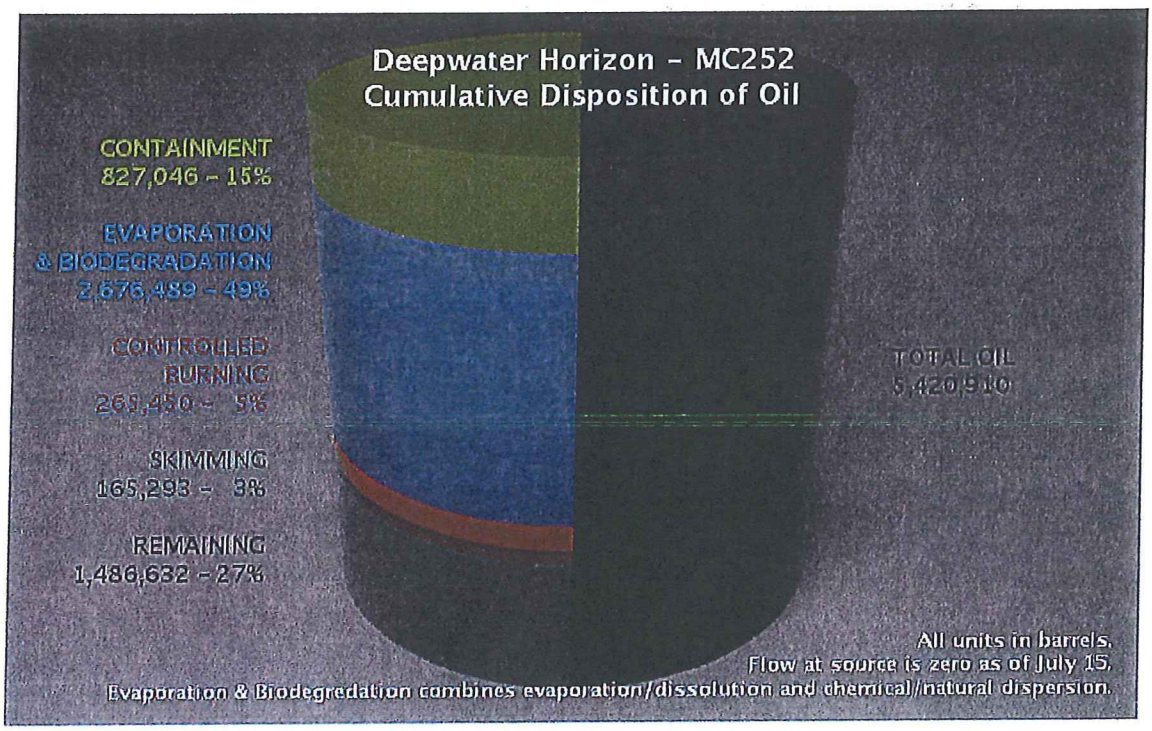
Higher Flow Estimate - Through August 01 (Day 104)

	Cumulative	August 01
Discharged	5,420,910	0
Recovered via RITT and Top Hat	827,046	0
Dispersed Naturally	862,510	0
Evaporated or Dissolved	1,405,187	0
Available for Recovery	2,326,167	0
Chemically Dispersed	408,792	0
Burned	265,450	0
Skimmed	165,293	21
Remaining	1,486,632	-21
Dispersant Used	43,900	0
Inland Recovery (Cumulative)	35,818 tons	

* All unlabeled values in barrels. See end notes for assumptions.

** Higher Flow Estimate is based on the government discharge estimate plus 10% uncertainty.

*** Maximum discharge ranged from 68,390 bbl on April 22, 2010 to 58,022 bbl on July 14, 2010.



Deepwater Horizon MC252 Gulf Incident Oil Budget

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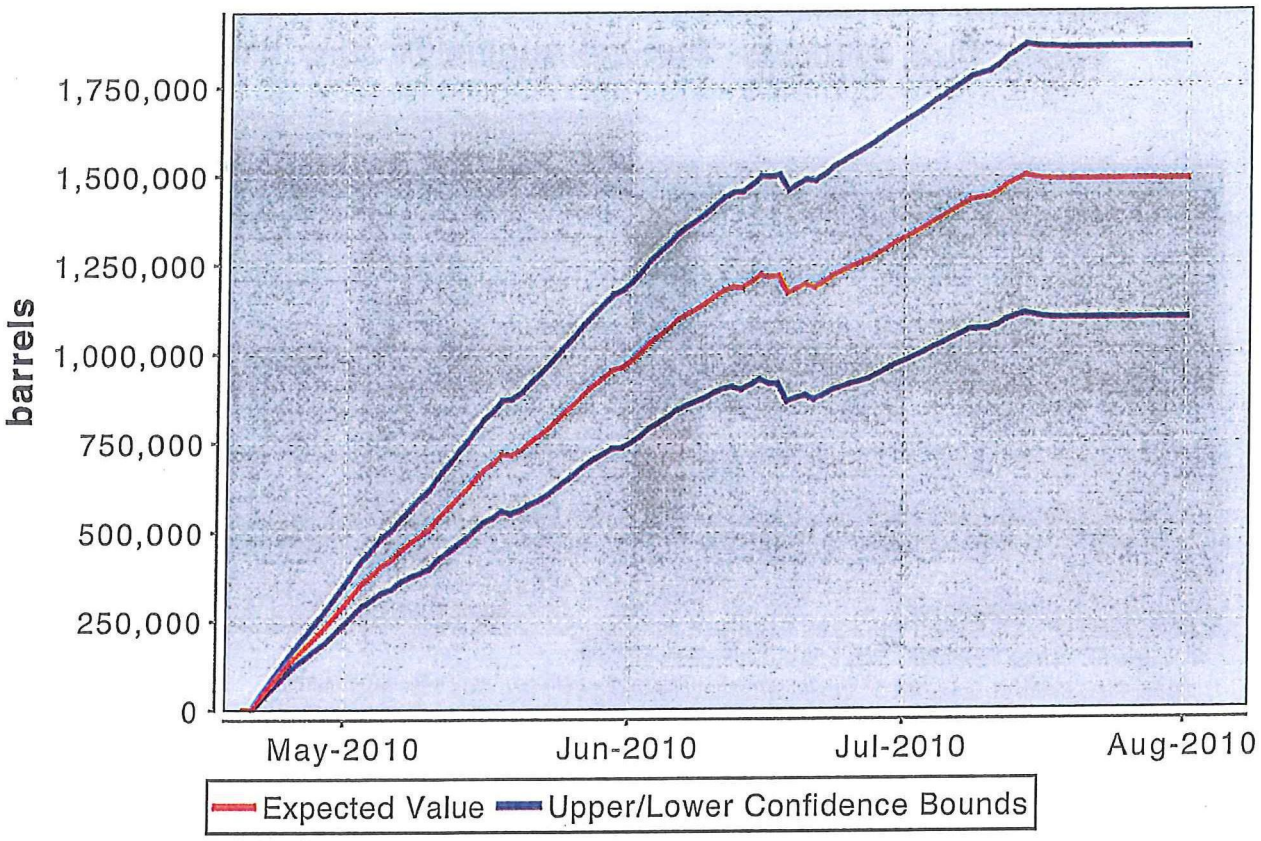
Application operated by the U.S. Coast Guard and provided by the U.S. Geological Survey in cooperation with the National Oceanic and Atmospheric Administration.

Higher Flow Estimate - Through August 01 (Day 104)

Cumulative Remaining



Deepwater Horizon MC252 Gulf Incident Oil Budget

Report generated by sbristol@usgs.gov on 08/02/2010 05:30 PM MDT.

See end notes section of the report for reference material on report elements.

Application operated by the U.S. Coast Guard and provided by the U.S. Geological Survey in cooperation with the National Oceanic and Atmospheric Administration.

Deepwater Horizon MC252 Gulf Incident Oil Budget

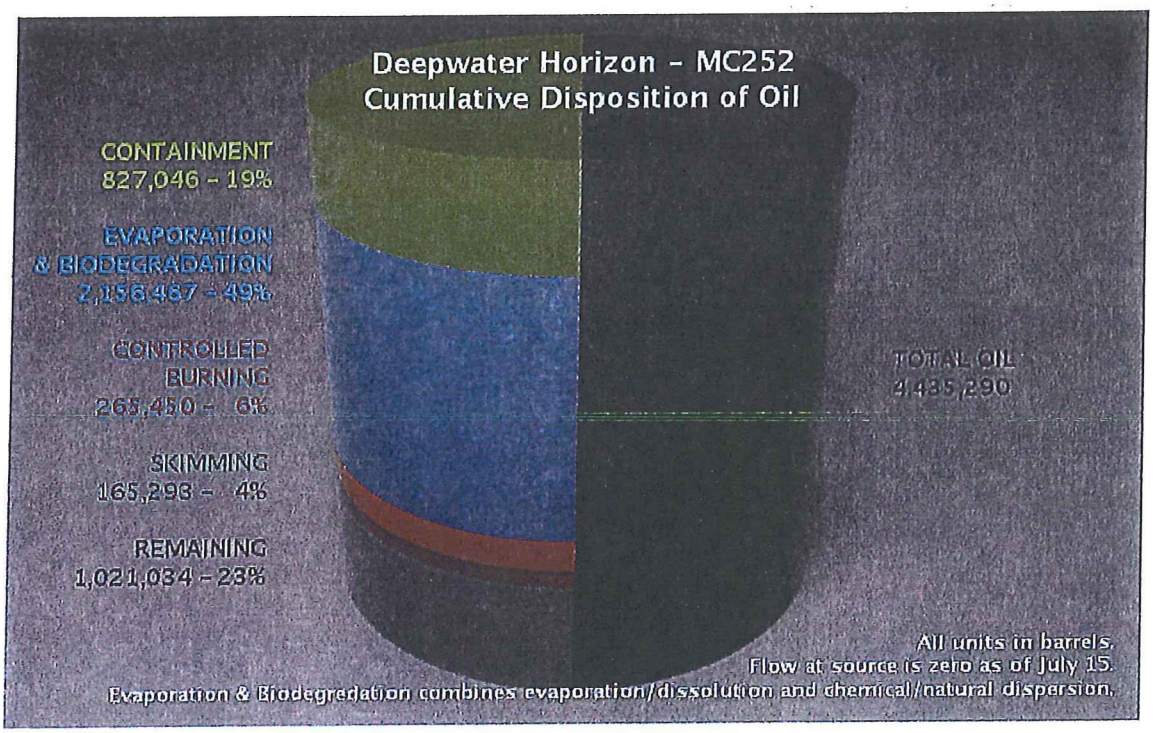
Lower Flow Estimate - Through August 01 (Day 104)

	Cumulative	August 01
Discharged	4,435,290	0
Recovered via RITT and Top Hat	827,046	0
Dispersed Naturally	665,386	0
Evaporated or Dissolved	1,082,289	0
Available for Recovery	1,860,569	0
Chemically Dispersed	408,792	0
Burned	265,450	0
Skimmed	165,293	21
Remaining	1,021,034	-21
Dispersant Used	43,900	0
Inland Recovery (Cumulative)	35,818 tons	

* All unlabeled values in barrels. See end notes for assumptions.

** Lower Flow Estimate is based on the government discharge estimate minus 10% uncertainty.

*** Maximum discharge ranged from 55,956 bbl on April 22, 2010 to 47,472 bbl on July 14, 2010.



Deepwater Horizon MC252 Gulf Incident Oil Budget

Report generated by sbristol@usgs.gov on 08/02/2010 05:30 PM MDT.

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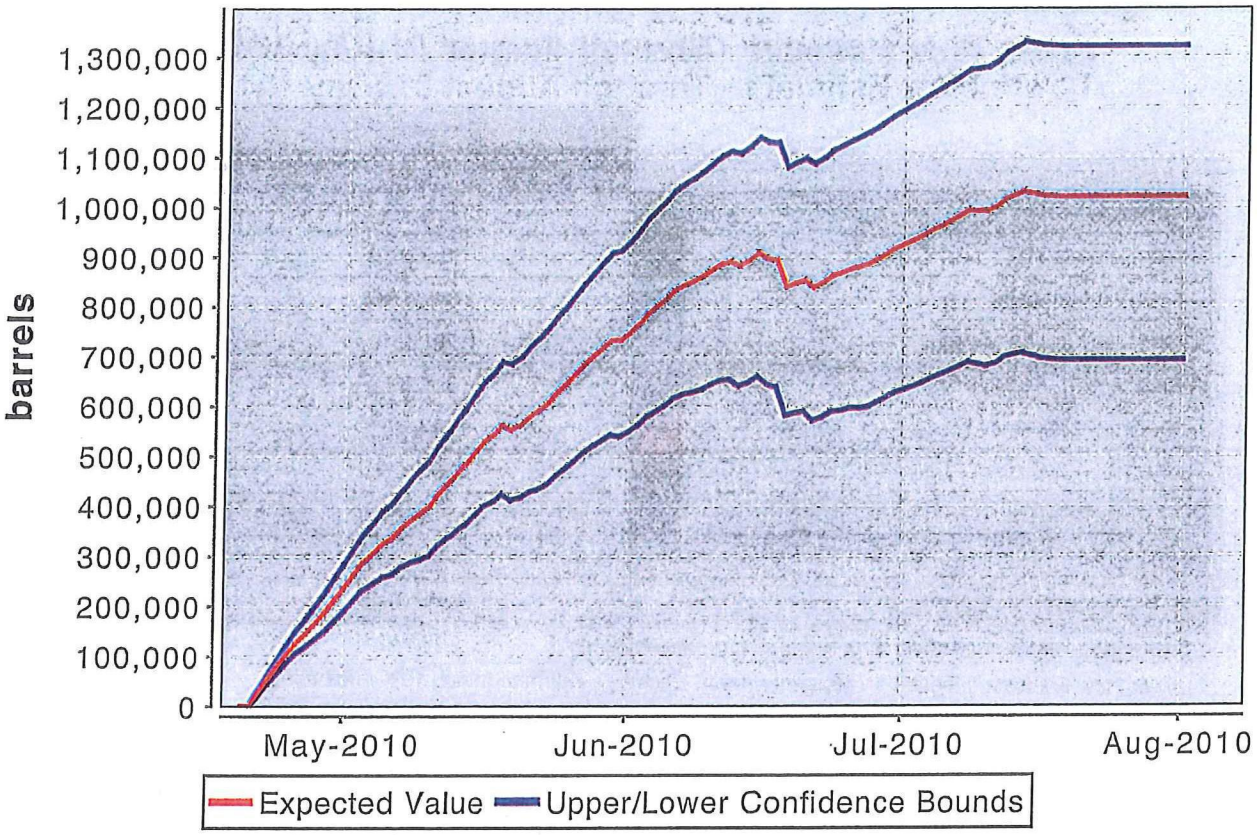
Application operated by the U.S. Coast Guard and provided by the U.S. Geological Survey in cooperation with the National Oceanic and Atmospheric Administration.

Lower Flow Estimate - Through August 01 (Day 104)

Cumulative Remaining



Deepwater Horizon MC252 Gulf Incident Oil Budget

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Application operated by the U.S. Coast Guard and provided by the U.S. Geological Survey in cooperation with the National Oceanic and Atmospheric Administration.

Reference Notes

Chart - Cumulative/Daily Volume Remaining on the Surface

The volume of oil that each day is added to the volume of oil already on the surface is computed, taking into account the effective discharge (total discharge minus volume collected via the Riser Insertion tool or the Top Hat), and the volume that is evaporated or dissolved, skimmed, burned, or dispersed (either chemically or naturally).

Chart - Deepwater Horizon MC-252 - Cumulative Disposition of Oil

The Cumulative Disposition of Oil "Barrel Graph" provides a representation of the total amount of oil released over time based on low and high discharge estimates, the relative amounts of oil recovered or dispersed by both natural and management methods, and the total remaining oil calculated by the oil budget model. The values used in the chart come from the calculations in a statistical model and correspond to the cumulative values in the table. See the footnotes (available in the Web application by clicking on the labels in the table) for further information on the individual calculations and additional reference material.

Discharged

On July 31, 2010, the U.S. scientific teams charged by National Incident Commander Thad Allen with determining the flow of oil from BP's leaking well refined their estimates of the oil flow. The teams estimated that the discharge rates ranged from 62,000 bbl/day at the start of the incident to 53,000 bbl/day when the well was capped on July 14 with an uncertainty factor of ±10%. The uncertainty factor in the best government estimate was used to create a Higher Flow Estimate and a Lower Flow Estimate report in the Oil Budget Tool.

Based on reports of major explosions and burning oil from the first two days of the incident (April 20-21), the estimate begins on April 22, 2010. In general, the discharge rate trended down over time due to decreasing reservoir pressure observed after the well was capped. Severing the riser on June 4 (Day 45), resulted in an estimate of discharge increase of approximately 4%. Placement of the containment cap on July 12 (Day 84) resulted in a flow decrease of approximately 4%

Previous Fixed Flow Rate

Previous versions of the Oil Budget Tool used a constant low and high flow estimate based on estimations from the Flow Rate Technical Group Plume Team PIV measurements. This method was chosen at the time as the best available process and because the same measurement method was

used pre- and post-riser cut. On June 15, 2010, an improved estimate of how much oil is flowing from the leaking BP well was announced. The most likely flow rate of oil at that time was estimated between 35,000 and 60,000 barrels per day. This improved estimate was based on more and better data that was available after the riser cut -- data which helped increase the scientific confidence in the accuracy of the estimate at that time.

Recovered via RITT and Top Hat

RITT and Top Hat are mechanical devices that British Petroleum (BP) has used to recover oil from the spill flow. Values for the amount recovered by the vessels Helix Producer, Discoverer Enterprise and the Q4000 are reported by BP, entered daily by National Incident Command personnel, and used in the calculation of remaining oil. Cumulative totals are a sum of all daily values entered.

Dispersed Naturally

Natural oil dispersion is estimated using the methods described in this annotation and background documentation. The following assumptions and factors apply:

- Droplets smaller than 100 micron are considered dispersed
- No natural surface dispersion assumed
- Subsurface natural dispersion based upon plume turbulent energy dissipation

Natural subsurface dispersion calculates the total discharge minus an estimation of subsurface chemical dispersion multiplied by a factor of natural dispersion effectiveness derived from a scientific method of determining oil dispersion in the water column.

Evaporated or Dissolved

Evaporation and dissolution occur naturally with oil on the surface. This element in the report is the result of a scientific calculation using the methods described in this annotation and background documentation. The following assumptions and factors apply:

- Evaporation formulas include dissolution
- Evaporation is the largest oil removal mechanism for surface oil
- Most evaporative losses occur during the first 24 hours

Evaporation is calculated differently for "fresh" oil within 24 hours (daily total in the report) and older oil for the cumulative total over time. Different factors are used to represent the difference in this rate. The evaporation/dissolution calculation first determines the remaining oil available for evaporative processes by removing the following from the total discharge:

- Measured amount removed via RITT and Top Hat
- Calculated amount of subsurface dispersion
- Reported amount of oil burned
- The remaining amount is then multiplied with a different factor based on scientific research and current observations conducted on the Deepwater Horizon incident.

Available for Recovery

The amount available for recovery, both daily and cumulative, is simply the remaining oil after removing the following from the total discharge:

- Measured amount removed via RITT and Top Hat
- Calculated amount of subsurface dispersion
- Calculated amount of evaporation and dissolution

Skimmed

Skimmed oil is a rough calculation based on the daily reported amount of oily water multiplied by a factored estimation of net oil content in oily water.

- The skimmed oil estimate is very rough
- The actual amount of skimmed oil should ultimately be based on actual measurement

Burned

Total burned values are entered daily by National Incident Command personnel and used in daily and cumulative totals.

- American Society for Testing and Materials (ASTM) burn rate standards are used
- Different rates for non-emulsified and emulsified oil

Chemically Dispersed

Chemical oil dispersion is the result of a scientific calculation based on the amount of chemical dispersant applied and recorded daily and acting on both surface and subsurface oil. The following assumptions and factors apply:

- Droplets smaller than 100 micron are considered dispersed
- No natural surface dispersion assumed

- International Tanker Owners Pollution Federation (ITOPF) "planning purpose" dosage of 20:1 used as estimate for successful chemical dispersant application

Dispersant Used

The amount of dispersant used is recorded each day of the incident by National Incident Command personnel. It is an actual measurement of the total dispersant used via all methods employed.

Oil Remaining

Volume of oil remaining after other known volume totals are removed from the total discharged.

DR. WILLIAM J. LEHR

Senior Scientist, Office of Response and Restoration, NOAA

Day 1, Panel 2: Flow Rate and Fate of the Oil

Anticipated Focus:

Dr. William J. Lehr will explain his role in generating the 5,000 barrels per day figure that became the government's official estimate of the rate at which oil was flowing from the Macondo well through May 27. Lehr will also discuss his work with the Flow Rate Technical Group, including the methods by which the group generated the government's official flow rate estimates. In addition, Lehr will explain the development and public release of the *Deepwater Horizon MC252 Gulf Incident Oil Budget*, which described the fate of the oil that spilled into the Gulf and generated substantial controversy. Finally, Lehr will discuss ongoing government efforts to publish in-depth, peer-reviewed reports relating to flow rate estimates and the fate of the oil.

Biography:

Dr. William J. Lehr is currently Senior Scientist at NOAA's Office of Response and Restoration. He was previously Spill Response Group Leader for the same organization, a technical analyst with NASA Jet Propulsion Laboratory, and held a joint appointment with the Research Institute and Mathematical Science Department at the University of Petroleum and Minerals. Lehr has also served as an adjunct professor for the World Maritime University and an oil spill consultant for UNESCO.

Lehr is a world recognized expert in the field of hazardous chemical spill modeling and remote sensing of oil spills. He has served as guest editor for the journal *Spill Science and Technology* and the *Journal of Hazardous Materials*. Lehr has also served as a reviewer for the National Academy of Science in a study of emulsified fuel spills, and as Co-Chair of the International Oil Weathering Committee. NOAA and the U.S. Coast Guard have awarded him several medals for his spill response efforts at major spill incidents of national or international significance. He has numerous publications in the field.

Lehr holds a Ph.D. in physics from Washington State University.

DR. IAN MACDONALD

Professor of Oceanography, Department of Earth, Ocean and Atmospheric Science, Florida State University

Day 1, Panel 2: Flow Rate and Fate of the Oil

Anticipated Focus:

Dr. Ian MacDonald will explain how he used publicly available satellite data to estimate the rate at which oil was flowing from the Macondo well within days of the Deepwater Horizon blowout. He will discuss the methods by which he concluded that the actual flow rate was significantly higher than the official government estimate. In addition, MacDonald can discuss recent scientific findings regarding oil on the sea floor, and what those findings may suggest about the fate of the oil in general.

Biography:

Dr. Ian MacDonald received simultaneous undergraduate degrees in environmental science from Friends World College in Huntington, NY, and Telemark District College in Norway. After completing these studies, he was employed by the International Ocean Institute and the Food and Agriculture Organization of the United Nations at postings in Malta and Rome. Returning to the United States by way of Southeast Asia, MacDonald completed a master's degree in fisheries sciences at Texas A&M University. Hired as a fisheries expert, he was assigned to a program studying the deep-sea biology of the Gulf of Mexico. This lead to an abiding interest in the deep sea and to a doctoral dissertation, also from Texas A&M, on the ecology of communities that flourish at natural oil seeps.

MacDonald is an internationally recognized authority on the biology and geology of marine oil seeps with some 60 peer-reviewed articles and over 60 reports and popular articles on related topics. His work provided the first documentation of seafloor brine pools associated with mud volcanoes and chemosynthetic communities. MacDonald's work on gas hydrates 1994 was the first to demonstrate a link between water column processes and the stability of shallow gas hydrates. He has contributed to recent work on the biogeochemistry of gas hydrates, including the discovery of so-called ice worms. In 2003, he was co-leader of a joint German, Mexican, U.S. expedition that discovered asphalt volcanism in the southern Gulf of Mexico. MacDonald's research has entailed extensive use of such deep-diving submarines. Altogether he has spent a total of 60 continuous days at depths of 1800 feet or more in the Gulf of Mexico. His particular interest is the application of imaging technology, satellite remote sensing, and in-situ instrumentation to marine research.

When the deadly accident on the semi-submersible drill ship Deepwater Horizon initiated the catastrophic discharge of oil from the BP Macondo well, MacDonald was among the first to recognize and publicly state that the spread of oil on the surface indicated a rate of discharge much greater than the 5,000 barrels of oil per day cited by authorities. During the BP oil spill, MacDonald was frequently called on for commentary by all the major U.S. television networks. He provided interviews and op-ed pieces for leading newspapers in the U.S. and Britain in addition to peer-reviewed papers in scientific journals.

DR. RICHARD CAMILLI

Assistant Scientist, Department of Applied Ocean Physics and Engineering, Woods Hole Oceanographic Institution

Day 1, Panel 2: Flow Rate and Fate of the Oil

Anticipated Focus:

Dr. Richard Camilli will discuss his efforts to determine the rate at which oil was flowing from the Macondo well, including his current estimate of the total spill volume. Camilli will also explain his recently published research describing a subsea hydrocarbon plume in the vicinity of the wellhead. He will discuss the data his team collected on the plume's composition and the rate at which it was being biodegraded. Finally, Camilli will compare his research to other recent studies on the biodegradation of hydrocarbons released into the Gulf during the Deepwater Horizon spill.

Biography:

Dr Richard Camilli's research interests include in-situ sensor and instrumentation design, AUV design, chemical oceanography, environmental informatics, intelligent control systems, remote sensing, GIS, high-resolution and concurrent mapping, and deep water archaeology.

Prior to assuming his current position in the Department of Applied Ocean Physics and Engineering, Camilli was at the Woods Hole Oceanographic Institution as a postdoctoral scholar at the Deep Ocean Exploration Institute, and a visiting investigator in the Department of Marine Chemistry and Geochemistry.

Camilli has received numerous accolades for his work, including an Aquanaut award from the NOAA National Undersea Research Program, a Mellon Interdisciplinary Research Award, and three Green Technology Innovation Awards. He holds a Ph.D. in civil and environmental engineering from MIT.

DR. TERRY HAZEN

Senior Scientist, Head of the Ecology Department and DOE Distinguished Scientist, Lawrence Berkeley National Laboratory

Day 1, Panel 2: Flow Rate and Fate of the Oil

Anticipated Focus:

Dr. Terry Hazen will discuss his recently published and ongoing research relating to the biodegradation of subsea hydrocarbons that emanated from the Macondo well. He will explain his finding that biodegradation was occurring faster than expected, and discuss its potential significance for the fate of the oil remaining in the Gulf.

Biography:

Dr. Terry Hazen specializes in environmental microbiology, especially as it relates to bioremediation, water quality and bioenergy. He is currently head of the Ecology Department and Center for Environmental Biotechnology, director of Microbial Communities for the Joint BioEnergy Institute, co-director of the Virtual Institute for Microbial Stress and Survival, and lead for the Microbial Enhanced Hydrocarbon Recovery Program of the Energy Biosciences Institute.

Prior to joining Lawrence Berkeley National Laboratory, Hazen was Professor, Chairman of Biology and Director of Graduate Studies at the University of Puerto Rico for 8 years. He is a fellow of the American Academy of Microbiology and has authored more than 210 scientific publications. In 2005, Hazen received the DOE BER Distinguished Scientist Award, one of only four ever given.

Hazen holds a Ph.D. in microbial ecology from Wake Forest University. He received his B.S. and M.S. in interdepartmental biology from Michigan State University.

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

THE USE OF SURFACE AND SUBSEA DISPERSANTS DURING THE BP DEEPWATER HORIZON OIL SPILL

---Draft---

Staff Working Paper No. 5[1]

This Working Paper examines the issues raised by the use of dispersants in the Deepwater Horizon spill. Dispersants change the distribution, not the amount, of oil within a marine environment. They are chemicals typically applied directly to oil on the water surface in order to break it into small droplets that can then mix with water below the surface. The dispersed oil is rapidly diluted, mixing both vertically and horizontally in the water column.[2] While this alleviates high concentrations at the surface, it may expose organisms to lower, but more widespread concentrations of oil.

The use of dispersants in the aftermath of the Macondo deepwater well explosion was enormously controversial for three reasons.[3] First, the total amount of dispersants used was unprecedented: 1.84 million gallons. Second, 771,000 of those gallons were applied at the wellhead, located more than five thousand feet below the surface. Little or no prior testing had been done on the effectiveness and potential adverse environmental consequences of subsea dispersant use, let alone at those volumes.[4] Third, the existing federal regulatory system governing dispersants pre-authorized their use at high volumes in the Gulf of Mexico without having required any federal government agency, including the U.S. Environmental Protection Agency (EPA), to consider specifically whether the use of dispersants in such amounts and in such locations was a good idea. Instead, faced with an emergency, the government had to make decisions about dispersants within time frames that denied officials the opportunity to gather the

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[1] Staff Working Papers are written by the staff of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling for the use of members of the Commission. They are preliminary and do not necessarily reflect the views of the Commission or any of its members. In addition, they may be based in part on confidential interviews with government and non-government personnel.

[2] Press Conference with Lisa P. Jackson, EPA Administrator (May 24, 2010), *available at* http://www.epa.gov/bpspill/dispersants/statement-dispersant-use-may24.pdf [hereinafter Jackson Press Conference]. For further information about dispersants, *see* Committee on Understanding Oil Spill Dispersants: Efficacy and Effects, National Research Council of the National Academies, UNDERSTANDING OIL SPILL DISPERSANTS: EFFICACY AND EFFECTS 9 (2005), *available at* http://www.nap.edu/catalog/11283.html [hereinafter NRC Report].

[3] The day after the Macondo well was capped and the amount of daily dispersant use dropped precipitously, a group of marine scientists opposed to the high volume use of dispersants issued a statement calling for an immediate end to their use. *See* Susan D. Shaw et al., *Consensus Statement: Scientists Oppose the Use of Dispersant Chemicals in the Gulf of Mexico* (July 16, 2010), *available at* http://www.meriresearch.org/Portals/0/Documents/CONSENSUS%20STATEMENT%20ON%20DISPERSANTS%20IN%20THE%20GULF%20updated%20July%2017.pdf.

[4] BP's "Lessons Learned" report refers to "limited trials and "some discussion in technical papers of applying dispersant to the source." BP, DEEPWATER HORIZON CONTAINMENT AND RESPONSE: HARNESSING CAPABILITIES AND LESSONS LEARNED 26 (2010), *available at* http://www.boemre.gov/ooc/PDFs/NarrativeFinal.pdf. BP also claims that "EPA has permitted use of dispersants subsea to remediate oil spills since the 1990s." *Id.* We have requested, but not yet obtained, information regarding the trials, papers, and EPA actions to which BP refers. None of the experts (whether from EPA, BP, or independent) with whom Commission staff spoke in researching this paper was aware of prior subsea use of dispersants, which suggests that any such use or approval was not well-known.

necessary information. The resulting uncertainty even fueled unfounded suspicions that BP was using dispersants without authorization from the government as an effort to mask the oil and limit its ultimate liability.

This paper considers two issues. The first is how well the government handled the dispersant issues it faced in the absence of necessary scientific information and pursuant to a regulatory regime that had failed to anticipate this kind of problem. The second is how, in light of lessons learned from this recent experience, government procedures and existing laws might be improved to allow for sounder decisions regarding the use of dispersants in the future.

The paper is divided into three parts. Part I provides background information on dispersants and their potential authorization for use in responses to oil spills. It then recaps the chronology of the use of dispersants following the Macondo well explosion. This chronology includes how much dispersant was used, where it was used, the types of dispersant used, and the role of various government agencies in making relevant decisions regarding dispersant use. Part I also describes some of the contemporaneous public controversy concerning the use of dispersants, including the debate, still persisting, regarding their potentially adverse impacts. Part II considers the distinct questions of whether the government's decisions were reasonable at the time; and whether, regardless of their reasonableness or unreasonableness when made, preliminary scientific research since undertaken suggests those decisions may, in fact, have been wise. Finally, Part III describes some possible implications for changes in agency procedures and regulations arising out of the use of dispersants in the Deepwater Horizon spill response that Commissioners may wish to consider.

I. Background on Dispersants

A. The Tradeoffs of Dispersant Use

When an oil spill occurs, responders have several tools to manage potential environmental impacts. Mechanical means are generally preferred, but they cannot always be used and do not recover all of the spilled oil.[5] Non-mechanical methods such as *in-situ* burning and chemical dispersants can contribute to the elimination and breakdown of the oil. In response to the Deepwater Horizon oil spill, BP used large amounts of the dispersant Corexit 9500 and some Corexit 9527.[6]

Dispersants function like detergents to break up oil into small droplets that mix easily with water. They contain a combination of surfactants and solvents. Surfactants are compounds that have lipophilic groups, which mix with non-polar substances like oil, and hydrophilic groups, which mix with polar substances like water. By combining lipophilic and hydrophilic groups, surfactants can lower surface tension to allow water and oil to mix more easily.[7] The

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[5] *See* NRC Report at 9 ("The effectiveness of mechanical response techniques is variable and highly influenced by the size, nature, and location of the spill as well the environmental conditions under which the response is carried out. Essentially, mechanical response works satisfactorily under a finite subset of all possible spill scenarios.").

[6] *See* David Biello, *Is Using Dispersants on the BP Gulf Oil Spill Fighting Pollution with Pollution?*, SCI. AM. (June 18, 2010), *available at* http://www.scientificamerican.com/article.cfm?id=is-using-dispersants-fighting-pollution-with-pollution. Toxicity information on these dispersants can be found in Anita George-Ares & James R. Clark, *Aquatic Toxicity of Two Corexit Dispersants*, 40 CHEMOSPHERE 897 (2000).

[7] *See* Coastal Response Research Center, RESEARCH & DEVELOPMENT NEEDS FOR MAKING DECISIONS REGARDING DISPERSING OIL 1 (Apr. 2006), http://www.crrc.unh.edu/dwg/dispersant_workshop_report-final.pdf [hereinafter CRRC Report].

solvents help the surfactants pass through the oil to reach the oil-water boundary where the surfactants operate.[8]

The resulting oil/water mixture takes the form of small droplets of dispersant-covered oil, which, because of their small size, can remain suspended in water rather than rising to the surface.[9] These droplets can move into and through the water column from the water's surface.[10] This process depends on outside forces to disperse the oil droplets through the top of the water column. For that reason, dispersants applied to surface oil slicks are more effective in areas with high wave energy.[11]

The toxicity of available dispersants has diminished substantially over the past several decades.[12] Generally, dispersants are less toxic than oil or chemically dispersed oil. However, dispersants and dispersed oil are typically more toxic than oil to embryos and larvae.[13]

Using dispersants to remove oil from the water surface has several potential benefits. First, less oil will float ashore to adversely affect shorelines and fragile estuarine environments. Second, animals and birds that float on or wade through the water surface may be less exposed to oil.[14] Third, dispersants may accelerate the rate at which oil biodegrades. Smaller droplets have a larger surface area to volume ratio, which in theory should allow microorganisms greater access to the oil, and speed their rate of consumption. The expected acceleration of this biodegradation is often cited as a major reason to use dispersants.

There are both uncertainties regarding the actual realization of some of these benefits, especially in the subsea, and potential offsetting costs. For instance, less oil on the surface means more in the water column, increasing exposure for subsurface marine life. And, while the smaller droplets may accelerate biodegradation, their smaller size may increase the odds that dispersed oil will be ingested. Smaller droplets may also be more likely to impact corals or the gills of fish. Moreover, the assumption of increased biodegradation is not undisputed by existing scientific literature. Some studies have found that dispersants have no effect on the biodegradation rate or may even inhibit biodegradation.[15] It is also only largely in the aftermath of the Macondo well explosion that scientists have begun research to consider the extent to which oil-eating bacteria are present at the low temperatures of deepwater.[16] Finally, there is no reason to suppose that all dispersants act in the same manner. They may, depending upon their chemical makeup, have strikingly dissimilar impacts. For example, some evidence indicates that the ionic surfactant in Corexit 9527 and 9500 inhibits biodegradation while their non-ionic surfactants increase biodegradation.[17]

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[8] *See* International Tanker Owners Pollution Federation Ltd, *Dispersants*, http://www.itopf.com/spill-response/clean-up-and-response/dispersants/.

[9] *See* CRRC Report at 7.

[10] *See* NRC Report at 10.

[11] *See* Merv Fingas, A REVIEW OF LITERATURE RELATED TO OIL SPILL DISPERSANTS 1997-2008 5 (Sept. 2008), *available at* http://www.pwsrcac.org/docs/d0053000.pdf.

[12] NRC Report at 207.

[13] *Id.*

[14] The NRC Report, however, suggests that the effect of dispersants on the fur and feathers of animals and birds—*e.g.*, potential negative effects on waterproofing—requires further study. *See* NRC Report at 196, 274.

[15] *See* Fingas at 22.

[16] *See, e.g.*, Richard Camilli et al., *Tracking Hydrocarbon Plume Transport and Biodegradation at Deepwater Horizon*, SCIENCE, Aug. 19, 2010 , http://www.sciencemag.org/cgi/content/abstract/science.1195223); Terry C. Hazen, et al., *Deep-Sea Plume Enriches Indigenous Oil-Degrading Bacteria*, SCIENCE, Aug. 24, 2010, http://www.sciencemag.org/cgi/content/abstract/science.1195979.

[17] *See* Fingas at 22.

B. Regulation of the Use of Dispersants in Oil Spill Response

The Clean Water Act expressly contemplates the use of dispersants in response to oil spills. Section 311(d)(2)(G) of the Act requires that the federal National Contingency Plan for oil spill response contain a schedule identifying:

> (i) dispersants . . . , if any, that may be used in carrying out the Plan,
>
> (ii) the waters in which such dispersants . . . may be used, and
>
> (iii) the quantities of such dispersant . . . which can be used safely in such waters . . . .[18]

In addition, subsection (G) requires each schedule to provide for use of other, non-listed dispersants: "[T]he President, or his delegate, may, on a case-by-case basis, identify the dispersants, other chemicals, and other spill mitigating devices and substances which may be used, the waters in which they may be used, and the quantities which can be used safely in such waters."[19]

The National Contingency Plan under the Clean Water Act and Oil Pollution Act of 1990 further provides for the establishment of regional and area-wide contingency plans, which may expressly pre-authorize the use of dispersants:

> In meeting the provisions of this paragraph, preauthorization plans may address factors such as the potential sources and types of oil that might be spilled, the existence and location of environmentally sensitive resources that might be impacted by spilled oil, available product and storage locations, available equipment and adequately trained operators, and the available means to monitor product application and effectiveness . . . . Approved preauthorization plans shall be included in the appropriate RCPs and ACPs [area and regional contingency plans].[20]

When dispersants have *not* been pre-authorized in an oil spill response contingency plan, they can still be approved after a spill has occurred. Federal regulations require the Federal On-Scene Coordinator to obtain approval in this circumstance from EPA and applicable state authorities, but require only consultation with the Department of Commerce (through the National Oceanic and Atmospheric Administration [NOAA]) and the Department of the Interior:

> [T]he OSC [On-Scene Coordinator], with the concurrence of the EPA representative to the RRT [Regional Response Team] and, as appropriate, the concurrence of the RRT representatives from the states with jurisdiction over the navigable waters threatened by the release or discharge, and in consultation with the DOC [Department of Commerce, *i.e.*, NOAA] and DOI [Department of the Interior] natural resource trustees, when practicable, may authorize the use of dispersants, surface washing agents, surface collecting agents, bioremediation agents, or miscellaneous oil spill control agents on the oil discharge, provided that the products are listed on the NCP [National Contingency Plan] Product Schedule.[21]

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[18] 33 U.S.C. § 311(d)(2)(G).
[19] *Id.*
[20] 40 C.F.R. § 300.910(a).
[21] 40 C.F.R. § 300.910(b).

The effect of pre-approval, accordingly, is to eliminate the need for approvals and consultations during the response and to allow the Federal On-Scene Coordinator to act unilaterally.

The National Contingency Plan also establishes "Area Committees"[22] under the direction of a Federal On-Scene Coordinator[23] that are charged with "work[ing] with State and local officials to expedite decisions for the use of dispersants and other mitigating substances and devices."[24]

The decision whether to approve the use of dispersants can be difficult, whether it occurs through the pre-approval process in developing a contingency plan or, in the absence of pre-approval, once a spill has occurred. As described by the National Research Council of the National Academies of Sciences, "[g]iven the potential impacts that dispersed oil may have on water-column and seafloor biota and habitats, thoughtful analysis is required prior to the spill event so that decision makers understand the potential impacts with and without dispersant application."[25] The trade-offs are complex:

> Decisions to use dispersants . . . involve trade-offs between decreasing the risk to water surface and shoreline habitats while increasing the potential risk to organisms in the water column and on the seafloor. This trade-off reflects the complex interplay of many variables, including the type of oil spilled, the volume of the oil, sea state and weather, water depth, degree of turbulence (thus mixing and dilution of the oil), and relative abundance and life stages of resident organisms.[26]

Under the National Contingency Plan, EPA is responsible for obtaining dispersant toxicity data from industry before placing a dispersant on the product schedule, which then serves as the basis for listing particular dispersants for pre-approved use in oil spill response contingency plans. The accuracy and consistency of pre-listing testing by manufacturers has been questioned, with toxicologists suggesting that the results of industry testing vary more widely than they should.[27]

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[22] "There is established for each area designated by the President an Area Committee comprised of members appointed by the President from qualified personnel of Federal, State, and local agencies." Clean Water Act § 311(j)(4)(A); 40 CFR § 300.5. In the spill-affected area there are two "areas" (and thus Area Committees) for Louisiana, three for Texas, two for Northwest/West Florida, and one for Mississippi/Alabama.

[23] "On-scene coordinator (OSC) means the federal official pre-designated by EPA or the USCG [U.S. Coast Guard] to coordinate and direct responses under subpart D, or the government official designated by the lead agency to coordinate and direct removal actions under subpart E of the NCP." 40 C.F.R. § 300.5. Admiral Mary Landry was the Federal On-Scene Coordinator until June 1, 2010, when Admiral James Watson assumed that role. On July 12, 2010, Admiral Paul Zukunft replaced Admiral Watson as the Federal On-Scene Coordinator.

[24] Clean Water Act § 311(j)(4)(B); *see also* 40 C.F.R. § 300.910(a) ("RRTs Area Committees shall address, as part of their planning activities, the desirability of using appropriate dispersants, surface washing agents, surface collecting agents, bioremediation agents, or miscellaneous oil spill control agents listed on the NCP Product Schedule, and the desirability of using appropriate burning agents.").

[25] *See* NRC Report at 3.

[26] *Id.* at 2.

[27] *See* Biello, *Fighting Pollution with Pollution.* Discrepancies between the pre-approval tests and EPA's post-spill toxicity testing results suggest that there were potential flaws in the earlier testing, although it may not be possible to resolve that question definitively at this late date. The pre-approval tests found differences in toxicity between dispersants that did not appear in the EPA test. *Gulf Coast Oil Spill: Small Business and the Cleanup Effort Before the S. Subcomm. On Small Business and Entrepreneurship*, 111th Cong. (June 18, 2010) (statement of Carys Mitchelmore) ("Noteworthy is that the reference toxicant LC50s for the different dispersants listed on the NCPPS differ by orders of magnitude, up to nearly 300-fold. For example, in Table 2 reference toxicant data for the mysid shrimp tests range from an LC50 (ppm, 96-hr) from 0.98 (for Sea Brat #4) to 267.7 (for Nokomis 3-F4). One product (Nokomis 3-AA) used copper sulfate as a reference toxicant instead of the EPA-required SDS reference

Moreover, the required pre-authorization testing is limited to acute toxicity studies (48 and 96 hours) on two species: a fish species and a mysid shrimp species, *Menidia beryllina* and *Mysidopsis bahia,* respectively. EPA commonly uses these species in laboratory tests, and they are useful in providing comparative acute toxicity information, but the tests are not designed as proxies for all possible adverse ecosystem impacts. The pre-testing of dispersants did not include other important matters such as environmental persistence, effectiveness with multiple varieties of oil and at multiple temperatures, byproducts, and endocrine effects.

C. The Use of Dispersants in Response to the Deepwater Horizon Spill

The federal government's response to the oil spill began immediately after the Macondo well explosion on the night of April 20, 2010, as part of its emergency search-and-rescue mission. Efforts to address the released oil were soon underway. Pursuant to the National Contingency Plan, the Coast Guard Captain of the nearest port, Morgan City, Louisiana, served as the Federal On-Scene Coordinator, in charge of the government's response action, until a few days later when the District (Eight) Commander, Rear Admiral Mary Landry, took over the Coordinator role.

The oil spill response contingency plans applicable to the Gulf (Regions 4 and 6 within the National Response Plan framework) pre-authorized the use of a list of specific dispersants. With the permission of the Federal On-Scene Coordinators, BP applied 14,654 gallons of the dispersant Corexit, which was on the approved list, on the surface during the week of April 20-26, 2010.[28] On April 30, 2010, response crews began testing the subsurface application of dispersants to oil escaping from the broken riser at a rate of nine gallons of dispersant per minute.[29] Nearly 3,000 gallons of subsea dispersants were applied.[30] On that same day, the Gulf spill was formally designated pursuant to the Oil Pollution Act as a "Spill of National Significance." Based on that designation, the Commandant of the Coast Guard, Thad Allen, became the "National Incident Commander" in charge of the federal government's response action.

During May, dispersants were applied both to the surface and subsea, and the volume used increased rapidly. During the week of April 27 to May 3, 2010, responders applied 141,358 gallons to the surface, and that amount grew to 168,988 by the following week.[31] The week of May 11 to May 17, 2010, the amount of surface dispersants used reached 255,000 gallons.[32]

On May 1, 2010, Admiral Thad Allen reported that test applications of subsea dispersants were underway at the site of the leak—where the oil flowed directly from the broken riser.[33] At

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toxicant. These issues are of concern if you are trying to compare the relative toxicity of the dispersants. Indeed, this currently, cannot be accurately assessed given the data presented on the NCPPS. These toxicity tests should be repeated.").

[28] The government's figures relating to the volume of dispersant use are available at http://app.restorethegulf.gov/go/doc/2931 (select "Latest News" button, select relevant date) [hereinafter Restore the Gulf Estimates].

[29] *Id.*

[30] *Id.*

[31] *Id.*

[32] *Id.*

[33] *See* Transcript from Press Briefing, Coast Guard Commandant Thad Allen and Assistant to the President for Homeland Security John Brennan (May 1, 2010), http://app.restorethegulf.gov/go/doc/2931/535447/. The full extent to which dispersants had previously been used subsea is unclear. But, in all events, none of the experts consulted by the Commission staff (whether BP, EPA, or independent) was aware of any prior use. Consequently,

the time, it was unclear to the Coast Guard whether the National Contingency Plan's pre-approval of the use of dispersants in the Gulf applied to subsea use in addition to surface use, and therefore whether additional EPA approval and NOAA consultation were required.[34] Notwithstanding that uncertainty regarding governing law, on May 7, 2010, "having deployed test applications of subsea dispersants, EPA halted subsea dispersant operations, awaiting additional test results."[35]

Testing and monitoring, however, presented substantial logistical and organizational problems. BP itself performed three tests, based on protocols established by EPA and the Coast Guard.[36] On May 15, 2010, the testing for effectiveness and toxicity that had been completed prompted EPA and the Coast Guard to announce their joint approval of subsea dispersant use with the condition that further monitoring be conducted.[37] The EPA Administrator, Lisa Jackson, made the approval decision on behalf of EPA herself and has since publicly acknowledged the difficulty of making such a decision with the limited amount of scientific information then available. Considerations related to response worker health and ease of application—subsea application would minimize the necessary human contact with dispersants, and could occur at night and in foul weather—reportedly played a role in the decision to approve the method.[38] By May 17, 2010, BP had made extensive use of dispersants. The cumulative totals by this time were 580,000 gallons on the surface and 45,000 gallons subsea.

On May 20, 2010, in the wake of continuing media reports relating public concern about the potential toxicity of the high volumes of dispersants being used,[39] the Coast Guard and EPA issued a joint directive requiring BP to identify and use a less toxic and more effective dispersant than Corexit 9500 from the list of dispersants authorized by the National Contingency Plan.[40]

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whatever the extent of such prior use, it does not appear to have been sufficiently prominent or well studied to have served as a basis for decisions made about the use of subsea dispersants in addressing the Macondo well spill.

[34] Interview with Coast Guard official.

[35] *See* H.R. Committee on Energy and Commerce, 111th Cong., CHRONOLOGY OF DEEPWATER HORIZON EVENTS, *available at* http://energycommerce.house.gov/documents/20100615/EE.Attachment.A.2010.6.12.pdf.

[36] *See* Conference Call with Lisa P. Jackson, EPA Administrator (May 12, 2010), *available at* http://www.epa.gov/bpspill/dispersants/may12transcript-final.pdf; *see also* Joel Achenbach & Steven Mufson, *Engineers draw battle lines in effort to plug gulf oil well: 'Top hat,' 'hot tap' among tactics pursued; uncertainties still loom*, WASH. POST (May 11, 2010).

[37] *See* EPA, DISPERSANT MONITORING AND ASSESSMENT DIRECTIVE FOR SUBSURFACE DISPERSANT APPLICATION (May 10, 2010); *available at* http://www.epa.gov/bpspill/dispersants/subsurface-dispersant-directive-final.pdf; EPA, DISPERSANT MONITORING AND ASSESSMENT DIRECTIVE FOR SUBSURFACE DISPERSANT APPLICATION–ADDENDUM 1 (May 14, 2010), *available at* http://www.epa.gov/bpspill/dispersants/subsurface-dispersant-addendum-final.pdf; Press Release, Deepwater Horizon Incident Joint Info. Center, *Coast Guard and EPA Approve Use of Dispersant Subsea in Further Effort to Prevent Oil From Reaching U.S. Shoreline* (May 15, 2010), *available at* http://app.restorethegulf.gov/go/doc/2931/551271/.

[38] Jeff Goodell, *The Poisoning*, ROLLING STONE (July 21, 2010). Administrator Jackson gave a wide-ranging and candid interview to *Rolling Stone*. In that interview, she stated that she told her aides that the approval decision was among the hardest choices she had ever made. She also reportedly said that BP argued for subsea application as a method that would reduce the overall volume of chemicals discharged into the marine ecosystem. *Id.*

[39] *See, e.g.*, Elizabeth Rosenthal, *In Gulf of Mexico, A Huge Experiment with Chemical Dispersants*, N.Y. TIMES (May 6, 2010) (characterizing "BP and federal officials [as] engaging in one of the largest and most aggressive experiments with chemical dispersants in the history of the country, and perhaps the world.").

[40] *See* EPA, DISPERSANT MONITORING AND ASSESSMENT DIRECTIVE FOR SUBSURFACE DISPERSANT APPLICATION–ADDENDUM 2 (May 20, 2010), *available at* http://www.epa.gov/bpspill/dispersants/directive-addendum2.pdf [hereinafter EPA ADDENDUM 2]. BP had used Corexit 9500 and 9527, though it discontinued use of the latter early on during the spill because Corexit 9527 contained 2-butoxyethanol, which had allegedly created health problems

According to the data in the National Contingency Plan Product Schedule, some of the pre-approved dispersants were both less toxic and more effective on South Louisiana crude oil than Corexit 9500.[41] Based on the Plan, the federal directive required BP to identify a less toxic alternative to be used both on the surface and subsea at the source of the oil leak within 24 hours, and to begin using the less toxic dispersant within 72 hours of submitting the alternative. Specifically, the directive called for toxicity levels "at or below" 23 parts per million (ppm) for *Menidia* or 18 ppm LD_{50} for *Mysidopsis*.[42] If BP was unable to identify acceptable alternative dispersant products, BP had to provide the Coast Guard and EPA with a detailed description of the alternative dispersants investigated, and the reasons they believed those products did not meet the required standards.[43]

BP responded to the directive the day it was issued.[44] BP contended that only five products on the National Contingency Plan Product Schedule (which lists acceptable dispersants) met the criteria in the directive and that Corexit 9500A was the "best alternative."[45] BP noted that one of these five acceptable dispersants "contains a small amount of a chemical that may degrade to a nonylphenol," a class of chemicals that have been identified as potential endocrine disruptors and may persist in the environment for a period of years.[46] Unfortunately, BP said, neither the manufacturer nor BP had had the opportunity to test the product for these potential effects.[47]

BP said that it would be prudent to obtain the chemical formulas for the other dispersants to evaluate their potential to degrade to a nonylphenol, but indicated that it had not been able to do so.[48] BP noted that "there may be only limited information on the constituents of the dispersants, since the dispersants typically contain proprietary substances whose identities are not publicly available."[49] In contrast, BP explained, Corexit's manufacturer said that it reached its maximum biodegradability within one month and was not persistent in the environment. In short, BP concluded, Corexit "appears to have fewer long term effects than the other dispersants

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for *Exxon Valdez* workers. *See* Elana Schor, *Ingredients of Controversial Dispersants Used on Gulf Spill Are Secret No More*, N.Y. TIMES (June 9, 2010).

[41] *See* EPA, NATIONAL CONTINGENCY PLAN PRODUCT SCHEDULE TOXICITY AND EFFECTIVENESS SUMMARIES, *available at* http://www.epa.gov/emergencies/content/ncp/tox_tables.htm#dispersants.

[42] *See* EPA ADDENDUM 2. LD_{50} is the dose that is lethal to 50% of the test population. *Menidia* is a genus of silverside fish found in the Gulf of Mexico. *Mysodopsis* are a type of shrimp used for toxicity testing. The reference to toxicity levels "at or below" designated LD_{50} levels was confusing, because a higher LD_{50} actually means a safer substance.

[43] *See* EPA ADDENDUM 2.

[44] *See* Letter from Douglas J. Suttles of BP to Rear Admiral Mary Landry, Commander, Eight Coast Guard District, and Samuel Coleman, Director, Superfund Division EPA Region 6 (May 20, 2010), *available at* http://www.epa.gov/bpspill/dispersants/5-21bp-response.pdf [hereinafter Suttles Letter]. This letter refers to the directive (EPA Addendum 2) as having a May 19, 2010 date.

[45] Corexit is a product of the Nalco Company, headquartered in Napier, Illinois. Corexit 9500A contains petroleum distillates, propylene glycol, and a proprietary organic sulfonate (a type of detergent). *See* Safety Data Sheet, Nalco Company, Corexit EC 9527A (May 11, 2010), *available at* http://www.deepwaterhorizonresponse.com/posted/2931/Corexit_EC9527A_MSDS.539295.pdf (last visited Sept. 14, 2010).

[46] *See* Suttles Letter.

[47] *See id.* The manufacturer tests were also conducted by different laboratories and on dispersants mixed with No. 2 fuel oil, not Louisiana sweet crude. *See* EPA, DISPERSANTS TOXICITY TESTING–PHASE II QUESTIONS AND ANSWERS (Aug. 2, 2010), *available at* http://www.epa.gov/BPSpill/dispersants/qanda-phase2.pdf [hereinafter DISPERSANTS TOXICITY Q&A] (explaining in answer to question seven that No. 2 fuel oil is not the oil in the Gulf).

[48] *See* Suttles Letter.

[49] *Id.*

evaluated."[50] BP also made clear that the company did not, in any event, then have a sufficient stockpile of any dispersants other than Corexit and Sea Brat #4, and that the Sea Brat #4 supply might not be sufficient for both surface and subsea use.[51] Corexit 9500 was the only dispersant used during the remainder of the spill.

In a May 24, 2010 press conference, EPA Administrator Jackson stressed three points, while generally acknowledging that federal regulators remained "deeply concerned about the things we don't know" such as the "long-term effect on aquatic life."[52] First, she said, the government was instructing BP to "take immediate steps to significantly scale back the overall use of dispersants" and expressed EPA's belief that "we can reduce the amount of dispersant applied by as much as half, and I think probably 75%, maybe more."[53] Second, she expressed dissatisfaction with BP's efforts to analyze other dispersant options.[54] Third, she announced, EPA would perform its own tests to verify BP's data and to "determine the least toxic, most effective dispersant available in the volumes necessary for a crisis of this magnitude."[55]

Two days later, Administrator Jackson sent a letter to David Rainey of BP criticizing BP's inadequate compliance with the May 20, 2010 directive, which had instructed BP "to analyze alternative dispersants for toxicity and effectiveness and report back within 24 hours."[56] "Because we believe your analysis of potential alternative dispersants was insufficient," she wrote, "the EPA is performing its own scientific verification of the data BP presented."[57] EPA said it would make laboratory comparisons with Gulf of Mexico species, including a silverside fish and a mysid shrimp.[58] EPA would also identify a test for endocrine disrupters.[59] Jackson's letter continued: "Furthermore, as we discussed, the federal government, led by the Coast Guard, is reiterating its instructions to BP to take immediate steps to significantly scale back the overall use of dispersants."[60] A May 26, 2010 directive provided that "BP shall eliminate the surface application of dispersants" except in "rare cases where there may have to be an exemption."[61]

On June 30, 2010, EPA released results of its own testing of eight dispersants.[62] EPA had conducted acute toxicity tests with two Gulf of Mexico aquatic species, and *in vitro* cytotoxicity (cell damage) and endocrine screening assays using human cell lines. EPA's results indicated that none of the eight dispersants displayed significant endocrine disrupting activity. It also suggested that Corexit 9500 was not overall more toxic than alternatives: "While the

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[50] *Id.*
[51] *See id.*
[52] Jackson Press Conference.
[53] *Id.*
[54] *Id.*
[55] *Id.*
[56] Letter from Lisa P. Jackson, EPA Administrator, to David Rainey, V.P. of Gulf of Mexico Exploration, BP Exploration and Production (May 26, 2010), *available at* http://www.epa.gov/bpspill/dispersants/Rainey-letter-052610.pdf.
[57] *Id.*
[58] *See id.*
[59] *See id.*
[60] *Id.*
[61] *See* EPA, DISPERSANT MONITORING AND ASSESSMENT DIRECTIVE FOR SUBSURFACE DISPERSANT APPLICATION–ADDENDUM 3 (May 26, 2010), *available at* http://www.epa.gov/bpspill/dispersants/directive-addendum3.pdf.
[62] *See* Press Release, Deepwater Horizon Incident Joint Info. Center, *EPA Releases First Round of Toxicity Testing Data for Eight Oil Dispersants* (July 1, 2010), *available at* http://www.deepwaterhorizonresponse.com/go/doc/2931/731363/ The dispersants were Corexit 9500A, Dispersit SPC 1000, JD-2000, Nokomis 3-AA, Nokomis 3-F4, SAF-RON GOLD, Sea Brat #4 and ZI-400.

dispersant products alone—not mixed with oil—have roughly the same impact on aquatic life, JD-2000 and Corexit 9500 were generally less toxic to small fish and JD-2000 and SAF-RON GOLD were least toxic to mysid shrimp."[63]

The effort to scale back use of dispersants had some effect. During the week of May 18, 2010, BP had applied 190,000 gallons total.[64] The following week, it applied roughly two-thirds as much (135,000 gallons).[65] Surface use fell from 120,000 gallons the week of May 18, 2010 to 40,000 gallons the week of May 25, 2010, although it then rose again and remained steady for several weeks at 80-90,000 gallons per week. By the end of May, BP had used a total of 950,000 gallons of dispersants, of which 740,000 were applied on the surface and 210,000 subsea.[66] As the following table shows, use of dispersants remained at a roughly constant level through most of June, but then began to decline again later in the month through early July:

[63] *Id.*
[64] *See* Restore the Gulf Estimates.
[65] *Id.*
[66] *Id.*

Table 1: Weekly Use of Dispersants June 1-July 12[67]

Week	Weekly Use of Dispersants (gallons)	Total Use of Dispersants to Date (gallons) (lower bound)[68]
June 1 – June 7	171,000 (total): 50,000 (surface) 121,000 (subsea)	1.12 million (total): 790,000 (surface) 331,000 (subsea)
June 8 – June 14	163,000 (total): 92,000 (surface) 71,000 (subsea)	1.28 million (total): 882,000 (surface) 402,000 (subsea)
June 15 – June 21	169,000 (total): 88,000 (surface) 80,000 (subsea)	1.45 million (total): 970,000 (surface) 482,000 (subsea)
June 22 – June 28	112,000 (total): 30,000 (surface) 83,000 (subsea)	1.56 million (total): 1 million (surface) 565,000 (subsea)
June 29 – July 5	145,000 (total): 40,000 (surface) 92,000 (subsea)	1.71 million (total): 1.06 million (surface) 645,000 (subsea)
July 6-July 12	90,000 (total) 10,000 (surface) 90,000 (subsea)	1.8 million (total) 1.07 (surface) 735,000 (subsea)

Despite the joint Coast Guard-EPA directive that BP "eliminate the surface application of dispersants" except in "rare cases where there may have to be an exemption," it is clear that the use of surface dispersants was not eliminated after May 26, 2010. The "rare cases" were not very rare. Until late June, surface use in most weeks remained at about 40% of the pre-directive rate.[69] The directive remained in effect despite suggestions that it be modified as responders became aware that the oil flow was much larger than previously believed.[70]

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[67] *Id.*

[68] The "lower bound" refers to the fact that, according to the source, use was "more than" these amounts. Note that "totals" may not exactly correspond to the sum of components, apparently due to rounding, use of different data sources, or minor calculation errors in the original source. Weekly totals in the table are calculated by subtracting the government figures for cumulative use between weeks; the results do not always correspond to the amounts reported separately for subsea and surface use. The discrepancies in the government figures appear to be relatively minor, however.

[69] *Id.*

[70] Letter from Rear Admiral James A. Watson, Federal On-Scene Coordinator, to Regional Response Team, Federal Region VI (June 22, 2010), *available at* http://markey.house.gov/images/DISPERSANTDOCUMENTSJUNE22-24.pdf.

After the well was capped on July 15, 2010, there was virtually no further use of dispersants. By that time, BP had applied a total of 1.84 million gallons, of which 1.07 million gallons were applied on the surface and 771,000 gallons were subsea.[71] As Table 1 indicates, the amounts injected underwater became larger than the amounts applied to the surface during the last three weeks. The week before the well was capped, only about 10% of dispersants used were applied to the surface. The National Incident Command estimated in an August 4, 2010 report that approximately 8% of the oil that escaped from the well was chemically dispersed, either subsea or on the surface, while about three times that much evaporated or dissolved due to other processes.[72]

Although the use of dispersants had ended earlier in the month, debate about the use of dispersants surfaced again at the end of July. On July 12, 2010, Admiral Allen's Chief of Staff informed Rep. Edward Markey that dispersants were used "only when absolutely necessary to preserve the health and safety of workers at the well site and to minimize shoreline impacts."[73] On July 30, 2010, Rep. Markey sent a letter to Admiral Allen pointing to more than 74 BP exemption requests in 48 days, of which all but ten were fully approved by the Coast Guard. Rep. Markey alleged "these applications appear to be rubber stamped by the Coast Guard."[74]

The next day, in a conference call, Admiral Allen and Administrator Jackson replied that they had cooperated closely and nearly attained the goal of a 75% reduction in dispersant use.[75] On August 1, 2010, Admiral Allen said in a press conference that field commanders on a case-by-case basis decided to use dispersants where surveillance aircraft spotted oil and no other method of cleaning it up was available in the area. Admiral Allen noted that the decision to use the dispersants did not rest with BP; rather, "it's a decision by the federal on-scene coordinator," he said, describing what he called a "very disciplined doctrinal process."[76]

In a *CNN* interview the following day, Admiral Allen elaborated upon the working relationship between Coast Guard and EPA regarding the use of dispersants. According to the Admiral, he and Administrator Jackson "talk daily about dispersant use," the Coast Guard "ha[s]n't ignored EPA's guidelines," and he was "satisfied" with dispersant use in the Deepwater Horizon disaster.[77] Relatedly, *CNN* quoted an EPA spokesman as saying that, "[w]hile EPA may not have concurred with every individual waiver granted by the federal on-scene coordinator, the agency believes dispersant use has been an essential tool in mitigating this spill's impact, preventing millions of gallons of oil from doing even more damage to sensitive marshes, wetlands and beaches and the economy of the Gulf coast."[78] These statements suggested that coordination with EPA did not mean that the Federal On-Scene Coordinator heeded EPA's

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[71] *Id.*

[72] *See* notes 92 and 93, *infra.*

[73] Letter from Peter Gautier, Chief of Staff, National Incident Command, to Rep. Edward J. Markey (July 12, 2010), *available at* http://markey.house.gov/docs/07-30-10ejmtocgdispersants.pdf.

[74] Letter from Rep. Edward J. Markey to Admiral Thad W. Allen, National Incident Commander, United States Coast Guard (July 30, 2010), *available at* http://markey.house.gov/docs/07-30-10ejmtocgdispersants.pdf

[75] Matthew L. Wald, *Despite Directive, BP Used Dispersant Often, Panel Finds,* N.Y. TIMES (Aug. 1, 2010). This claim appears to have been based on a comparison to the highest daily rate of use, rather than a comparison of amounts used on a weekly basis. *See* Table 1.

[76] Press Conference with Thad Allen, National Incident Commander, U.S. Coast Guard (Aug. 1, 2010), *available at* http://www.deepwaterhorizonresponse.com/go/doc/2931/838395/&printerfriendly=1.

[77] *Allen 'satisfied' with dispersant use in Gulf oil disaster,* CNN, Aug. 2, 2010, http://edition.cnn.com/2010/US/08/01/gulf.oil.spill/index.html#fbid=CAHE69XH089.

[78] *Id.*

advice on all occasions. Given the pre-approval of dispersant use, the Federal On-Scene Coordinator was not required to do so.

II. Assessing the Federal Government's Use of Dispersants During the Deepwater Horizon Spill

It is too early to assess many aspects of the federal government's use of dispersants in response to the Deepwater Horizon Spill between the explosion on April 20, 2010 and the containment of the well on July 15, 2010. In making any assessment, moreover, it is important to distinguish between three inquiries: (1) whether the federal government adequately prepared in advance for the possible use of dispersants to address such a spill; (2) whether, once the spill occurred, the government's decisions regarding the use of dispersants were reasonable in light of the resources and the information then available; and (3) whether, with the benefit of hindsight, those government decisions, regardless of the reasonableness or unreasonableness at the time they were made, were in fact wise.

A. The Adequacy of the Government's Contingency Planning

The first of these three questions is the one most easily answered. The government was not adequately prepared for the use of dispersants to address such a large oil spill. Notwithstanding the National Contingency Plan's express requirements for planning regarding the use of dispersants, including pre-authorization to deal with emergencies, EPA clearly did not anticipate the potential demands of an oil spill of the kind the nation faced after the Macondo well explosion. In particular, EPA did not consider, in its roles on the National Response Team and the relevant Regional Response Teams, the possibility that dispersants might have to be used in the massive volumes required in the Gulf. And, EPA did not consider the distinct possibility that massive volumes of dispersants might be needed at the subsea level.

Neither lapse can be justified on the ground that a major subsea spill was wholly unforeseeable. The oil and gas industry has been extracting high volumes of oil from reservoirs in the Gulf for twenty years. This is not a new, unanticipated development. Nor is deepwater drilling. Yet, EPA did not meet its charge in national oil spill response contingency planning to consider adequately the challenges of dispersant use flowing from such large-scale operations, especially operations in deepwater. Indeed, in many respects, EPA did not anticipate the related issues at all. The toxicity tests that EPA required were limited in nature and did not appear to take account of either the likely amounts or locations of dispersant use necessary in the event of a well blowout, in particular a deepwater blowout.

Nor had NOAA adequately planned for such an event. NOAA has significant responsibility to provide scientific support for national response and contingency planning pursuant to the Clean Water and Oil Pollution Acts.[79] Its related expertise arises out of its work in many areas, including its duties under the Endangered Species Act,[80] Marine Mammal Protection Act,[81] and Magnuson-Stevens Fishery Conservation and Management Act[82] to protect endangered and threatened species of marine life, to protect marine mammals, and to conserve

[79] 40 C.F.R. §§ 300.145, 300.175, 300.210.
[80] 7 U.S.C. §§ 1531 *et seq.*
[81] 16 U.S.C. §§ 1361 *et seq.*
[82] 16 U.S.C. §§ 1801 *et seq.*

and manage the nation's fisheries in U.S. waters. Yet, similar to EPA, NOAA had never adequately considered the potential impact of massive use of dispersants on marine life and the nation's fisheries.

As a result, the National Incident Commander, the EPA Administrator, and the NOAA Administrator were seriously handicapped when the Macondo well explosion occurred and decisions had to be made immediately in the absence of adequate contingency planning. They had to make extremely difficult choices with insufficient information about the critical tradeoffs identified by the National Academy of Sciences for the use of dispersants: the value of the dispersants in reducing the harm caused by released oil versus the potential risks of harm from the dispersants themselves. The limited toxicity data they possessed was itself questionable,[83] and, as previously described,[84] failed to consider the full range of toxic impacts—*e.g.*, environmental persistence, endocrine effects—that could result from the unprecedented uses now being contemplated by federal officials.

The absence of adequate contingency planning also had a further negative impact on the effectiveness of the government's response. It made unclear the lines of authority between various federal agencies in determining whether dispersants should be used. In particular, there was uncertainty regarding the extent to which the Coast Guard needed to secure EPA's approval before permitting the use of dispersants. Notwithstanding the lack of any requirement that the Federal On-Scene Coordinator defer to EPA on the use of dispersants at the surface (given EPA's pre-approval), and the lack of a clear requirement with regard to the subsea, EPA decided to exercise substantial control over both types of dispersant use, which reportedly at times led to delays in necessary decision-making (and, according to Coast Guard responders, to some avoidable shoreline impacts from oil as a result of the inability to use dispersants quickly).[85]

B. The Reasonableness of the Government's Decision To Authorize the Use of Dispersants at the Time It Was Made

As described above, the reasonableness of the federal government's decision to authorize the use of dispersants is distinct from the questions of whether there was adequate contingency planning (which there was not) and whether the decision turned out to be wise. This

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[83] *See* Biello, *Fighting Pollution with Pollution* (quoting toxicologist Carys Mitchelmore). Corexit is inappropriate for use closer to shore:

> COREXIT is also not approved for use in U.K. waters because it fails the so-called "limpet test." That test involves spraying the dispersant and oil on rocks and seeing if limpets (a type of small mollusk) can still cling to them, a test which COREXIT, and many other dispersants with slippery surfactants fail. "This is not a product for rocky shores," Villalobos says. "These are only for open sea waters."

Id.

[84] *Id.*

[85] In interviews with Commission staff, responders stated that EPA representatives on the scene, unlike representatives from other government agencies, were not empowered to make binding decisions notwithstanding EPA's claims of authority over the use of dispersants. Instead, those EPA representatives had to relay information to agency superiors, which inevitably delayed decisions that needed to be made quickly. In addition, these response participants from other federal agencies stated that the EPA on-scene representatives sometimes lacked the necessary experience in oil spill response and that EPA scientists with such experience were not being adequately consulted in EPA's decision-making process. Finally, these individuals expressed an overall concern that EPA's internal decision-making procedures were simply not well organized to make the kind of rapid decisions necessary in the oil spill context, which are quite different from the lengthier deliberative processes that mark the kind of long-term regulatory rulemakings in which EPA more routinely engages.

reasonableness inquiry instead focuses on whether the government acted reasonably given the limited knowledge and resources that it possessed at the time. Based on the information the Commission staff currently has, we cannot say that the government acted unreasonably in deciding to approve the use of massive volumes of dispersants at the subsea and surface.

Because federal agencies had failed to plan adequately, they did not possess the scientific information that officials most certainly would have wanted to guide their choices. They had to make choices nevertheless: Millions of gallons of oil were flowing from the Macondo well into the Gulf of Mexico every day, imperiling the responders who worked in the immediate vicinity of the spill, millions of residents living along the Gulf Coast, the entire Gulf marine ecosystem, and the fishing and tourism industries.

Given the conditions under which officials like Admiral Allen and EPA Administrator Jackson were acting, there is no clear evidence that their decisions to authorize high volumes of dispersants, including at the subsea, were unreasonable. They instead appear to have acted reasonably in the difficult circumstances in which they were placed, including an impressive effort by the Regional Response Teams to seek input as quickly as possible from fifty expert scientists.[86] The Teams convened the experts, who reported on June 4, 2010 a consensus that "use of dispersants and the effects of dispersing oil into the water column has generally been less environmentally harmful than allowing the oil to migrate on the surface into the sensitive wetlands and near shore coastal habitats."[87] In the experts' view, though gaps in relevant information exist, the environmental trade-off between the deep-ocean ecosystem and the shoreline made dispersants an acceptable choice.

There are, however, three caveats regarding the decision-making process. First, Commission staff heard repeated reports that EPA could have done a better job of ensuring that its on-scene representatives had both the expertise and the authority to make decisions regarding the use of dispersants, so as to avoid the delays that reportedly occurred because of the absence of such authority and expertise.

The second caveat relates to implementation of the planned approach for decision-making regarding dispersants. The planning documents for the area require the Regional Response Teams to make decisions about novel uses of dispersants, upon request from the Federal On-Scene Coordinator. Here, as the issue of dispersant application became more and more prominent in the media, and correspondingly more politicized, the decisions to apply both surface and subsea dispersants were taken out of hands of the Regional Response Teams. Admiral Allen and Administrator Jackson to a large extent bypassed the National and Regional Response Team structures and instead issued decisions regarding dispersant policy through joint directives. Though this reflected the high level at which the issues were being evaluated, it was outside of the process that responders were supposed to implement.

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[86] In May, the Regional Response Teams asked for scientific input to direct their future dispersant use and, to that end, fifty experts met together on May 26 and 27, 2010 at the Louisiana State University for the "Deepwater Horizon Dispersant Use Meeting." Coastal Response Research Center, DEEPWATER HORIZON DISPERSANT USE MEETING REPORT 5 (June 4, 2010) *available at* http://www.crrc.unh.edu/dwg/dwh_dispersants_use_meeting_report.pdf. In the meeting, the experts split into four breakout groups: (1) efficacy and effectiveness of surface and deep ocean dispersants use; (2) physical transport and chemical behavior of dispersants and dispersed oil; (3) exposure pathways and biological effects resulting from deep ocean application of dispersants; and (4) exposure pathways and biological effects resulting from surface application of dispersants. *Id.*

[87] *Id.* at 4.

These two caveats aside, the Commission staff has reason to believe that there was generally a sound and cooperative working relationship between the federal agencies on the question of dispersants. While the National and Regional Response Teams did not play the coordinating and decision-making role envisioned under the National Contingency Plan, the Federal On-Scene Coordinators worked directly with EPA and NOAA on dispersant policy. That coordination resulted in, among other things, the specific designation of subsea dispersants as an appropriate response technology subject to stringent limits on amounts as well as expansive testing and monitoring guidelines. In addition, the Federal On-Scene Coordinators and EPA worked together to reduce significantly the application of surface dispersants and to resolve the disagreements between the two agencies.

The third caveat relates to the role of BP. The fact that BP itself (or its oil spill response contractors) directly applied the dispersants authorized by the federal government led to the impression that BP rather than federal officials was in charge of decisions regarding dispersant use. Commission staff has not discovered any evidence that such a usurpation of government authority occurred. Nor could Commission staff conclude, based on interviews with Coast Guard responders, that BP or its contractors ever intentionally violated government directives regarding dispersant use (*e.g.*, regarding the permitted locations for such use). Yet, the impression remained and fueled public distrust of the decision to use dispersants.

C. The Wisdom of the Federal Government's Decision To Permit Use of High Volumes of Dispersants at the Surface and Subsea

It is too soon to answer this final question with the degree of certainty necessary for scientific analysis. The gap between what federal government officials should know prior to the use of high volumes of dispersants at the surface and subsea and what they in fact know has begun to narrow. But fully closing that gap will require rigorous scientific inquiry based on years of data collection and analysis, followed by the essential process of peer review, before any conclusions can be drawn upon which future government officials can safely rely.

With this crucial limitation in mind, EPA's preliminary analyses do not suggest that the government's use of dispersants caused major problems. Just the opposite, they support the view that the benefits of dispersant use may have outweighed the costs.

First, it seems undisputed that the subsea use of dispersants served an important function by increasing the safety of the working conditions faced by responders in the immediate vicinity of the spill. That included individuals working on containment efforts—to cap the well—and those seeking to retrieve, burn, and skim oil. The very real concern had been that high concentrations of volatile organic compounds within the oil would be a serious safety and health hazard to response workers. The use of subsea dispersants, by significantly reducing the volume and concentration of the oil reaching the surface, likewise reduced those associated risks.[88]

Second, EPA's subsequent toxicity tests, while still preliminary, have not revealed major problems. On August 2, 2010, EPA released the results of additional tests on the toxicity of dispersants, which the Agency contended "confirm that the dispersant used in response to the oil spill in the gulf, Corexit 9500A, is no more or less toxic than the other available alternatives."[89] The EPA report itself concluded:

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[88] *See* Interview with government official.

[89] *See* DISPERSANTS TOXICITY Q&A.

> Overall, the dispersants/L[ouisiana] S[weet] C[rude]mixtures were classified as being highly toxic to moderately toxic depending on the test species and dispersant. The ZI-400/ L[ouisiana] S[weet] C[rude] mixture was the exception and would be considered only slightly toxic to *Menidia*. Corexit 9500A, the dispersant that has been applied offshore at the surface and in the deep ocean, falls into the moderately toxic category for both species. For all eight dispersants in both test species, the dispersants alone were less toxic than the dispersant-oil mixture.[90]

Finally, EPA also reported on August 2, 2010 that the dispersants seemed to have succeeded in protecting the coastal area from greater contamination from the oil spill. The Agency referred to "fluorescence data that indicated the dispersants are working to keep the oil away from the shore. . . . [T]he dispersants are working to keep oil off our precious shorelines and away from sensitive ecosystems."[91] The Agency further noted that "EPA monitoring has not found dispersant chemicals in water or sediment near coasts or wetlands."[92]

On August 4, 2010, experts from NOAA, the National Institute of Standards and Technology, and the United States Geologic Survey released two reports that lent support to the claim that dispersants decreased the harms that might have otherwise resulted from the oil spill, by indicating that a significant percentage (8%) of the oil was chemically dispersed: the *Deepwater Horizon MC252 Gulf Incident Oil Budget* and a supporting document entitled *BP Deepwater Horizon Oil Budget: What Happened to the Oil* (collectively, the Oil Budget).[93] These reports have since been the subject of controversy for potentially overstating in significant respects and understating in other respects the amount of oil from the spill "remaining" in the Gulf.[94] One major focal point of criticism was the failure of the Oil Budget to analyze and take account of biodegradation, which chemical dispersants are intended in part to promote.[95] Several subsequent, non-governmental reports have debated the biodegradation issue, with some concluding that significant biodegradation has occurred because of the fortunate presence of high levels of oil-consuming microbes in the lower depths of the Gulf, while others question that conclusion.[96]

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[90] EPA, COMPARATIVE TOXICITY OF LOUISIANA SWEET CRUDE OIL (LSC) AND CHEMICALLY DISPERSED LSC TO TWO GULF OF MEXICO AQUATIC TEST SPECIES (July 31, 2010), *available at* http://www.epa.gov/BPSpill/reports/phase2dispersant-toxtest.pdf.

[91] Conference Call with Paul T. Anastas, EPA Assistant Administrator (Aug. 2, 2010), *available at* www.epa.gov/bpspill/dispersants/conference-call-transcript-08022010.pdf [hereinafter Anastas Conference Call]. Later data supports this conclusion about oxygen levels. *See* Paul Voosen & Katie Howell, *Gulf Spill Roundup: Subsurface Oil Increasingly Difficult to Detect—NOAA*, E& E NEWS (Sept. 2, 2010), *available at* http://www.eenews.net/eenewspm/print/2010/09/07/1.

[92] *See* Anastas Conference Call.

[93] DEEPWATER HORIZON MC252 GULF INCIDENT OIL BUDGET (Aug. 4, 2010), *available at* http://www.noaanews.noaa.gov/stories2010/PDFs/DeepwaterHorizonOilBudget20100801.pdf; Jane Lubchenco et al., BP DEEPWATER HORIZON OIL BUDGET: WHAT HAPPENED TO THE OIL? (Aug. 4, 2010), *available at* http://www.deepwaterhorizonresponse.com/posted/2931/Oil_Budget_description_8_3_FINAL.844091.pdf.

[94] For further discussion, see the Draft Staff Working Paper on the amount and fate of the oil.

[95] *Id.*

[96] The subsequent reports include, ordered by their release date: the Georgia Sea Grant report (Aug. 17, 2010) (available at http://uga.edu/aboutUGA/joye_pkit/GeorgiaSeaGrant_OilSpillReport8-16.pdf), which suggested that only a small amount of biodegradation had occurred; a peer-reviewed Woods Hole Oceanographic Institution Team report (August 19, 2010), which suggested the existence of an "oil plume" and that rapid biodegradation might not be occurring (*see* Camilli et al., *Tracking Hydrocarbon Plume Transport*); a peer reviewed article published by a team from the Lawrence Berkeley National Laboratory (Aug. 24, 2010), which found evidence of increased microbial respiration within the "plume" and concluded that biodegradation rates were "faster than expected" (*see*

The ongoing scientific debate regarding the extent of actual microbial degradation of Macondo oil underscores the futility of trying now to conclude whether the government's decision to use high volumes of dispersants was wise or unwise. It will take years to determine to any meaningful degree of scientific certainty the true "fate" and impacts of dispersed oil.[97] And it will likewise take years to determine whether the dispersants themselves, used in such high volumes, including at the subsea, have any longer-term detrimental effects on marine life or public health. For now, the most that can be said is there has yet to be clear and compelling evidence of harmful, short-term effects.

III. Issues for Commission Consideration

This final Part describes policy implications for Commissioner consideration that arise from possible lessons learned from the use of dispersants during the Deepwater Horizon spill response. These lessons and related policy implications are not intended as exhaustive of those that may flow naturally from the above analysis, but merely illustrative of the possibilities.

A. Further Research

Perhaps more than anything, the Deepwater Horizon experience with dispersants reveals the paucity of the kind of information that government officials need to make intelligent decisions about dispersant use in response to an oil spill. Although the absence of such information was well known before April 20, 2010, its practical effect had not been so glaringly realized.

As of 1999, EPA reported, "few long-term environmental effects tests have been conducted after a dispersant application."[98] In 2005, the National Research Council noted that U.S. research funding to support oil spill response was "extremely limited and declining" (with an annual total below $10 million).[99] The Council called on the relevant federal agencies to develop an integrated research plan focusing on peer-reviewed information.[100] Only a quarter of the $40 million in proposed research funding on dispersants and chemically dispersed oil ever materialized.[101]

The Deepwater Horizon oil spill confirms the urgency of these prior funding requests and suggests additional needs as well, including, for example, studies about the impacts of high volumes of dispersants, subsea impacts, and the long-term fate and effects of dispersants—none

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Hazen, et al., *Deep-Sea Plume*); and, most recently, a peer reviewed report published in *Science Express* on September 16, 2010 (David L. Valentine et al., *Propane Respiration Jump-Starts Microbial Response to a Deep Oil Spill*, SCIENCE EXPRESS) which adds yet another nuance by suggesting that less of the oil may be being degraded than the Lawrence Berkeley study concluded because microbial activity may be degrading larger amounts of natural gas than liquid oil.

[97] For example, as explained by NOAA Administrator Jane Lubchenco, "one of the worst case scenarios involving longer exposures due to dispersed oil—big losses of spawning bluefish tuna populations—may not be detectable for years." *See* Eli Kintisch, *An Audacious Decision in Crisis Gets Cautious Praise*, 329 SCIENCE 735, 736 (2010).

[98] EPA, UNDERSTANDING OIL SPILLS AND OIL SPILL RESPONSE 13 (1999).

[99] NRC Report at 4.

[100] *Id.*

[101] *Id.* at 5-8; *see* Elana Schor, *Oil Spill Dispersants Shifting Ecosystem Impacts in Gulf, Scientists Warn*, N.Y. TIMES (July 30, 2010) ("[Dr. Nancy] Kinner said the National Research Council's report outlined a $40 million plan for dispersant research, but a quarter of the money materialized over the past five years.").

of which appear to have been meaningfully addressed or at least addressed to the extent that now seems essential.[102] Efforts are ongoing to learn more about dispersant impact in the Gulf. On August 3, 2010, the National Incident Commander recommended a detailed monitoring strategy with NOAA as the operational lead to evaluate the "distribution of indicators of break-down products of dispersants used in oil spill response activities."[103]

The development of dispersant alternatives should also be a high priority. So-called "green chemistry" carries promise. Dispersants would seem to be a potentially important market for efforts to find new chemical products that are effective, less toxic, and, especially important in the context of dispersants, more readily biodegradable.

Research and development, of course, requires funding. Offshore drilling provides a context within which substantial funding should be in reach. The nation's need for oil and gas from the outer continental shelf is undeniable. But so too are the massive revenues those reserves yield in the market and the harm, as recent events demonstrate, if drilling goes awry. The smallest fraction of those revenues, whether charged directly to industry or originating in what the government already receives, would provide a major benefit in terms of potential to mitigate the impact of oil spills from offshore drilling.

B. Government Contingency Planning and Decision-Making Procedures

Government contingency planning for the use of dispersants was, as described, seriously lacking. The federal agencies charged with planning did not adequately anticipate the need for dispersants in high volumes and at subsea locations. Federal officials must now survey existing and future offshore facilities and locations and consider systematically the particular challenges they present for spill response. Federal officials should not find themselves similarly faced in the future with the need to make immediate decisions in the absence of adequate information.

Contingency planning reform should extend to rethinking both testing requirements and the use of pre-approved lists of dispersants. Plainly, the pre-approval process has significant advantages in the immediate aftermath of an oil spill and for that reason should not be abandoned. Indeed, it should be more rigorously applied by ensuring that those dispersants that are pre-approved are subject to more comprehensive testing.

There is clearly a need for expanded testing and greater information regarding dispersants placed on the National Contingency Plan Product Schedule, to include characteristics such as effectiveness and persistence under different environmental conditions. Testing should also be based on the use of higher volumes, including subsea. Moreover, current protocols for industry testing may not be adequate to yield reliable and consistent results.[104] Given the ever-changing nature of the underlying science, periodic updating of testing and testing protocols is essential.

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[102] *See* CRRC Report at 7 (confirming need for research into "chemical dispersion," including understanding "the long-term fate of chemically dispersed oil" and "investigating...multiple oil (including heavy) and dispersant types.").

[103] Memorandum from Admiral Thad. Allen, National Incident Commander, Deepwater Horizon Response, to Rear Admiral Paul Zukunft, Federal On-Scene Coordinator (Aug. 3, 2010), *available at* http://www.deepwaterhorizonresponse.com/external/content/document/2931/875939/1/SUB-SURFACE%20OIL%20AND%20DISPERSANT%20DETECTION,%20SAMPLING%20AND%20MONITORING%20STRATEGY.pdf; *see also* Press Conference with Admiral Thad Allen, National Incident Commander, Deepwater Horizon Response, and Dr. Jane Lubchenco, NOAA Administrator (July 27, 2010), *available at* http://www.deepwaterhorizonresponse.com/go/doc/2931/829055/.

[104] *See, e.g.*, Biello, *Fighting Pollution with Pollution.*

The Deepwater Horizon spill also suggests the possibility of including temporal, spatial, and/or volumetric limits on the pre-approval of dispersants for use in a geographic area. It is one thing to pre-approve based on the frequently reliable assumption that the response action will be limited in time, space, and dispersant volume. But, as the Deepwater Horizon spill dramatically illustrated, where those assumptions no longer hold, the force of a pre-approval is diminished. In particular, there is more reason to allow for federal officials other than the On-Scene Coordinator, such as EPA officials who possess particular expertise, to play a role in decision-making during the actual response. To that end, contingency planning for the use of dispersants during oil spill response should consider distinguishing between types of oil spills, based on their temporal duration, spatial reach, and volume.

With greater authority comes greater responsibility. During the Deepwater Horizon spill, there were reports that on-scene EPA representatives lacked the expertise and authority essential in a response action. Any enhancement of EPA's authority therefore must be coupled with assurances that EPA has the resources and clear lines of decision-making authority necessary for effective spill response. Ultimately, any recommendations for changes in the unified command structure should turn not just on the recent experience with the use of dispersants, but on a more cross-cutting inquiry, which is the subject of a separate Commission staff working paper. The issues surrounding dispersant use should inform that broader set of recommendations.

Finally, federal officials must from the outset leave no question in the public's mind regarding who is in charge during an emergency response, especially when, as happened with dispersants, public concern with the wisdom of the government's decisions is great. Here, a mistaken impression was created in the minds of too many that BP was making the decisions based on its own interests. That misimpression fueled the controversy over the potentially harmful impacts of dispersants, which itself harmed the public, creating real fears that had economic consequences to the extent that they affected tourism and other consumer choices. In the future, government officials must leave no doubt that they, and not private industry, are making these difficult decisions.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 26 2010

THE ADMINISTRATOR

Mr. David Rainey
Vice President of Gulf of Mexico Exploration
BP Exploration and Production
501 Westlake Park Boulevard
Houston, Texas 77079

Dear Mr. Rainey:

In your response dated May 23, 2010, you stated that you will continue to search for an alternative dispersant and that you fully understand and intend to comply with the directive from the U.S. Environmental Protection Agency and the U.S. Coast Guard to minimize the use of dispersants. I want to reinforce the importance of this approach to the BP oil spill response.

In the directive we sent last week, the EPA instructed you to analyze potential alternative dispersants for toxicity and effectiveness and report back within 24 hours. The goal of that directive was to determine whether a less toxic, more alternative dispersant existed in the quantities necessary to address this crisis.

Before I discuss the steps the EPA will take, I want to reiterate what Admiral Landry and I stated on a press conference call yesterday: The EPA and the Coast Guard believe your response to the directive was insufficient. We believe the response lacked sufficient analysis and focused more on defending your initial decisions than on analyzing possible better options.

Because we believe your analysis of potential alternative dispersants was insufficient, the EPA is performing its own scientific verification of the data BP presented. In addition, the EPA will perform testing to determine whether there is indeed a less toxic, more effective dispersant available in the volumes necessary for a crisis of this magnitude. The EPA will be performing at least two types of assessments to evaluate COREXIT 9500 and 9527 and other dispersants. Laboratory comparisons will be made with Gulf of Mexico species, including a silverside and Mysid shrimp. The EPA will use the quality assurance and testing methods set forth in the EPA test manuals (http://www.epa.gov/waterscience/methods/wet/disk2/index.html).

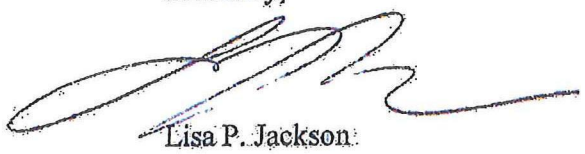
The EPA also will identify a test for endocrine disrupters and will use the test results to help make a determination in selecting less toxic dispersants.

Furthermore, as we discussed, the federal government, led by the Coast Guard, is reiterating its instructions to BP to take immediate steps to significantly scale back the overall use of dispersants. Data demonstrates that subsea dispersant application is having an effect on the oil at the source of the leak and thus far has had no observed significant ecological effects. Because so much is still unknown about the potential impact of dispersants, BP should use no more dispersant than is necessary. By decreasing the amount of dispersant used, particularly on the surface where we expect less undispersed oil because of the subsea application, BP can reduce the amount of dispersant applied by as much as 75 percent and possibly more.

Finally, I reiterate that BP must operate openly and transparently. Your response to EPA's directive contained redacted information because BP and dispersant manufacturers claim some sections of the response contain confidential business information. Once again, we demand that you immediately release to the public all of the information BP has claimed as CBI and urge you to do all you can to ensure Americans are fully informed about the potential environmental impact of these alternative dispersants.

I have attached a directive from the EPA and the Coast Guard requiring you to significantly reduce dispersant use. I fully expect your immediate and complete compliance with the requirements of the directive.

Sincerely,



Lisa P. Jackson

FOLLOW ED

Aug. 1, 2010: Markey Study: Coast Guard Allowed BP, Spill Responders to Excessively Use Dispersants

Coast Guard Rubber-Stamped Applications as BP Provided Vastly Different Numbers to Congress, Executive Branch

WASHINGTON (July 31, 2010) – Rep. Edward J. Markey (D-Mass.), Chairman of the House Energy and Environment Subcommittee, today released a letter sent to National Incident Commander Thad Allen and documents revealing that the U.S. Coast Guard, tasked with limiting BP's use of toxic dispersants during the Gulf oil spill disaster, repeatedly allowed the oil company to use excessive amounts of the chemical on the surface of the ocean.

These exemptions were granted on a daily basis despite a prior federal directive that the company cease that tactic to combat the spill except in "rare" circumstances. The exemptions were also extended to Houma Unified Command, an oil spill response center in Houma, La., which consists of U.S. Coast Guard and other personnel and reports to the Federal On Scene Coordinator.

In many cases, these applications appeared to be rubber stamped by the Coast Guard, including pre-approvals for weeks' worth of unlimited use, as well as retroactive approvals for surface applications of dispersants for which BP failed to obtain prior permission. These actions by the Coast Guard appear to have largely undercut a directive it co-signed with the U.S. Environmental Protection Agency that said that dispersant chemicals be used on the ocean's surface only in "rare cases," and only with advance approval.

Rep. Markey's letter, based on an analysis conducted by the Energy and Environment Subcommittee staff, further showed that by comparing the amounts BP reported using to Congress to the amounts contained in the company's requests for exemptions from the ban on surface dispersants it submitted to the Coast Guard, that BP often exceeded its own requests, with little indication that it informed the Coast Guard or that the Coast Guard attempted to verify whether BP was shooting past the approved volumes.

"BP carpet bombed the ocean with these chemicals, and the Coast Guard allowed them to do it," said Rep. Markey. Rep. Markey has authored numerous oversight letters to EPA, the Coast Guard and the FDA related to dispersant use, and has additionally introduced H.R. 5608, legislation that would require more extensive testing of these chemicals before they are used. **"After we discovered how toxic these chemicals really are, they had no business being spread across the Gulf in this manner."**

On May 17, Rep. Markey wrote to the EPA raising concerns about the use of unprecedented volumes of dispersants in the Gulf, as the chemicals had not undergone a thorough review of their toxicity or effects. Following a rapid analysis by the EPA, on May 26 the agency, along with the Coast Guard, directed BP to completely eliminate surface application of the chemicals except in "rare cases" for which exemptions had to be requested.

Yet following that directive, Rep. Markey's analysis shows that more than 74 daily exemption requests

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were sent to the Coast Guard by BP and Houma Unified Command, and all of them were approved by the Coast Guard, usually within the same day, and despite concerns raised by EPA that the exemptions were being approved on a pro forma rather than rare basis, and that these approvals were occurring without the specific data and justification required.

The analysis also found that the amounts of surface dispersants used that were reported by BP to Congress and the amounts reported to have been used that were contained in BP's requests for approval by the Coast Guard also vary widely, bringing into question whether BP was being truthful about the total amount used, and whether the Coast Guard was conducting rigorous monitoring and oversight over the company's use of the chemical.

For example, in one approval request, one of BP's top executives, Doug Suttles, claimed that the maximum daily application of dispersants on the surface in the days preceding June 16, 2010 was 3,360 gallons on June 12. However, an examination of the dispersant totals BP provided to congressional staff in its daily "Gulf of Mexico Oil Spill Response Updates" indicates that on June 11, BP said it applied 14,305 gallons of the chemical on the surface; on June 13, 36,000 gallons; and on June 14, 10,706 gallons.

According to publicly disclosed amounts on DeepwaterHorizonResponse.com, more than 1.8 million gallons of toxic dispersants were used to break up the oil as it came out of the well, as well as after it reached the ocean surface. The validity of those numbers are now in question.

"Either BP was lying to Congress or to the Coast Guard about how much dispersants they were shooting onto the ocean," said Rep. Markey. **"These huge discrepancies also raise the question of whether the Coast Guard made sufficient efforts to verify the information BP provided in support of its requests, and whether it exercised appropriate oversight surrounding the use of these toxic chemicals."**

Chairman Markey's July 30 letter to the Coast Guard is available here: http://markey.house.gov/docs/07-30-10ejmtocgdispersants.pdf

Chairman Markey's June 24 letter to the Coast Guard is available here: http://markey.house.gov/docs/06-24-10_ejm_dispersant_coast_guard.pdf

The Coast Guard's July 15 letter to Chairman Markey is available here: http://markey.house.gov/docs/07-15-10cgtoejmdispersants.pdf

Documents related to the analysis, in chronological order:

http://markey.house.gov/images/DISPERSANTDOCUMENTSMAY28-31.pdf
http://markey.house.gov/images/DISPERSANTDOCUMENTSJUNE1-7.pdf

http://markey.house.gov/images/DISPERSANTDOCUMENTSJUNE8-14.pdf

http://markey.house.gov/images/DISPERSANTDOCUMENTSJUNE15-21.pdf

http://markey.house.gov/images/DISPERSANTDOCUMENTSJUNE22-24.pdf

http://markey.house.gov/images/DISPERSANTDOCUMENTSJUNE25-29.pdf

http://markey.house.gov/images/reduced.DISPERSANTDOCUMENTSJULY1-7.pdf

http://markey.house.gov/images/DISPERSANTDOCUMENTSJULY8-19.pdf

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National Incident Commander
Deepwater Horizon Response

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16451

The Honorable Chairman Edward J. Markey
Subcommittee on Energy and Environment
2125 Rayburn House Office Building
Washington, DC 20515-6115

AUG 2 0 2010

Dear Chairman Markey:

I am providing a preliminary response to your July 30, 2010 letter inquiring about our reasoning in authorizing the use of dispersants during the Deepwater Horizon oil spill response.

As you are aware, no new oil from the Macondo 252 well has entered the Gulf since the capping of the well on July 15, 2010 and we have not used dispersants since July 19, 2010. With the well capped and the imminent completion of the "bottom kill" operation, we do not currently plan to apply dispersants again in this response. To best answer your questions about our previous use of dispersants, I will discuss the facts and considerations that the Federal On Scene Coordinator (FOSC) weighed in authorizing their use, both before and after issuing Addendum III to the Dispersant Monitoring and Assessment Directive ("Addendum III").

Protecting Shores from Oil is a Priority

From the beginning of the response, the Deepwater Horizon Unified Command placed the highest priority on the prevention of oil impacts to the ecological and economically sensitive Gulf Coast shoreline. Shrimp, fish and other species either live in or spend critical developmental periods of their lifecycles in the swamps and marshes. The preservation of these marshes is critical to both the ecological diversity of the Gulf of Mexico and the preservation of its fisheries. In addition, we placed a priority on minimizing impacts to the pristine beaches which are a major source of tourism revenue for these five states.

Dispersants are an Effective Back-up to Collection, Skimming and In-situ Burning

Dispersants were one of several tools for preventing oil from impacting the shore. The Unified Command used subsea collection, surface collection (skimming), in-situ burning and booming to prevent oil from reaching the shore. But the effectiveness of each collection method depends upon the weather, sea state and the condition of the oil to be collected. For example, oil which has been in the water for a significant period of time is not suitable for in-situ burning. Neither skimming nor in situ burning are effective when the sea state is particularly rough. The effectiveness of dispersants increases as sea states increase. When in-situ burning and skimming were ineffective or not practicable due to weather or sea state, dispersants were used as an adaptable management strategy during these periods. Because the oil flowed 24 hours a day, the FOSC assessed the daily conditions and determined the most effective response techniques and tools to deploy each day and the use of dispersants was considered as part of this assessment. All FOSC dispersant use decisions were made with the concurrence of or in consultation with the EPA, natural resource trustees from the Department of the Interior (DOI), Department of Commerce (DOC) and the State of Louisiana as required by 40 CFR 300.910 and the Regional Response Team VI guidelines.

Scientific consensus supports the effectiveness and appropriateness of chemical dispersants. By breaking the oil into tiny droplets, natural biological processes are better able to break down the oil. The 2005 National Research Council (NRC) report "Oil Spill Dispersants: Efficacy and Effects," concluded that the potential acute lethal toxicity of chemically dispersed oil is primarily associated with the dispersed oil and dissolved oil constituents following dispersion and not with the current generation of dispersants themselves.

Recent scientific studies by the EPA & FDA suggest that the use of dispersants on the oil is less harmful than the oil alone. On August 1, 2010, EPA announced that they had completed the second phase of dispersant testing to assess the acute toxicity of multiple concentrations of Louisiana Sweet Crude Oil alone, and combinations of this oil with each of the eight dispersants on the National Contingency Plan Product Schedule. The results indicated that the eight dispersants tested are similar to one another based on standard toxicity tests on sensitive aquatic organisms found in the Gulf. These results confirm that the dispersant used in response to the oil spill in the Gulf, Corexit 9500A, is generally no more or less toxic than the other available alternatives. In addition, the EPA found that oil alone was more toxic to mysid shrimp than the eight dispersants when tested alone. Previous EPA testing indicated that none of the eight dispersants (including Corexit 9500A) displayed biologically significant endocrine disrupting activity. Additionally, the FDA has determined that the chemical dispersants used to combat the Deepwater Horizon oil spill have a low potential for bioconcentration in seafood species. The decision to use dispersants was never undertaken lightly. In this case there was an environmental trade-off; the known harm of oil to the environmentally sensitive marsh habitat outweighed the potential harm that might be caused by the use of dispersants off shore in the marine benthic environment. Again these decisions were made in full consultation and concurrence with the EPA, DOC, and DOI.

Dispersants Were Only Used when Necessary

Even prior to Addendum III, dispersants were used only when considered necessary. Our decision to use dispersants was triggered by the need to control the amount of Volatile Organic Compounds (VOCs) at the well site for the safety of the workers drilling the relief well and to disperse oil when other recovery methods were insufficient or ineffective. The quantity of dispersant used was decided based upon known properties of oil and dispersant. Responders would estimate the quantity of oil they observed at a site and then estimate the amount of dispersant to use based upon an established formula of 1 gallon of dispersant for 20 gallons of oil. The FOSC would be briefed on this information and would approve or disapprove the applications as appropriate.

Our top operational priority has always been to ensure the safety and welfare of citizens and response personnel. As you are aware, VOCs pose both short and long-term health impacts to individuals exposed to them. For most spills, VOCs quickly disperse through natural processes. But in this spill, VOCs at the source control site were constantly refreshed by new oil flowing out of the well. VOC levels did not begin to dissipate until the cap was installed making elevated VOC levels a continuous problem as responders attempted to control the source of the spill. In order to ensure the safety of the response personnel, it was necessary to use dispersants at the site of the source of the oil.

When levels are too high to minimize the health risks to workers who are exposed to VOCs, workplace-safety regulations require that workers must wear personal protective equipment (PPE).

However, the use of masks and other PPE in the extreme high heat and humidity of the Gulf significantly increased the risk of heat related injuries to the more than 1,400 workers at the source control site. Because of the hazards from the VOCs, it was important to keep the concentration of VOCs low at the source site. The application of dispersants in the subsurface and by surface vessels at the site enabled safe source control operations by dramatically reducing the concentration of VOCs as detailed in pages 6-7 of enclosure (1).

Away from the source control site, aerial dispersants were used when other methods were not suitable or available for recovering the oil away from sensitive shoreline areas. Enclosures 2-7 are examples of the Dispersant Use Requests which provide specific examples of the factors which led to the selection of aerial dispersants for each application. In general, the factors that the FOSC considered in choosing to deploy aerial dispersants included the broad size of the spill (as much as 7,200 square miles), the geographical distribution of the various oil slicks, and the on-scene weather.

Source Control Vessel Dispersant Use was Authorized Separately from Aerial Dispersant Use.

Authorization to use "source control vessel" (SCV) dispersants was requested separately from authorization for aerial dispersants. SCVs deployed surface dispersants only at the well site and only for VOC control as discussed above. That activity is recorded separately from other surface dispersants used because the circumstances of dispersant application were different. Surface dispersant application by vessels at the well site was necessary because the high concentration of vessels and platforms made aerial application unsafe. The Responsible Party's June 16, 2010, letter regarding SCV dispersant use for the week of June 17-23rd (enclosure 8) requests permission to deploy up to 6,000 gallons per day at the well site, and states that the maximum amount used in the previous week was 3,360 gallons on June 12th. This authorization was a separate authorization to control VOCs and was independent of the authorization to deploy aerial dispersants in other parts of the response area as a response measure. The authorization to deploy aerial dispersants on those days is detailed in separate letters on June 10 (two letters), 12, 13, 14, and 15th. Table 1, below, summarizes authorized and actual use of source and aerial dispersants for the week of Jun 10-16, 2010.

Table 1

Date dispersant applied	SCV authorized (gal)	SCV Used (gal)	Aerial Authorized (gal)	Aerial Used (gal)
June 10	6,000	1,366	21,000*	4,506
June 11	6,000	0	15,300	14,305
June 12	6,000	3,360	7,000**	6,996
June 13	6,000	800	36,000	35,212
June 14	6,000	35	17,800***	10,703
June 15	6,000	160	23,000	2,608
June 16	6,000	213	27,700	13,380

*32,000 gallons requested
** 38,160 gallons requested
***38,880 gallons requested

Subsea Dispersant Varied in Response to Necessity
Your letter requested information regarding two occasions where the FOSC varied from established subsea dispersant application levels. On June 4, the placement of the Lower Marine Riser Package (LMRP) cap disrupted the regular subsea application of dispersants and resulted in the dispersant deployment wand being moved to a non-optimal position. In addition, there was an increased flow from the well head after the riser was cut and as a result, VOC emissions at the source increased to hazardous levels. To reduce VOCs, BP requested and was granted authorization to increase subsea dispersant application to 23,000 gallons for June 4, 2010, via letter dated June 4, 2010. (Enclosure 9)

Between 2100 and 2400 hours on June 18th, site safety monitors at the well site recorded an increase in VOCs. On June 19th, the FOSC authorized BP to increase subsea dispersant use to 15 gallons per minute which equates to 21,600 gallons over 24 hours. (Enclosure 10) On June 19th, 17,780 gallons of dispersant were applied and VOCs were reduced to safe working levels. Once VOCs were effectively controlled, subsea application was decreased to within the authorized level (<15,000 gallons/ day) on June 20th.

Addendum III significantly reduced the amount of Aerial Dispersants Used.
Once Addendum III was in place, the FOSC significantly reduced the amount of dispersants used. During this time, the average amount of total dispersants used in all applications (subsea, source and aerial) dropped 28%; from 26,358 gallons to 19,097 gallons on days where dispersants were deployed.

The most dramatic decrease was in aerial application. Prior to Addendum III, (between April 21st and May 26th), dispersants were used on 28 of 35 days (80%), with an average daily application of 24,386 gallons. Between May 27th and July 19th, dispersants were used on 33 of 54 days (61%), with an average daily application of 8,892 gallons, a 64% reduction in amount applied.

Although source application of dispersants was governed by the level of VOCs at the source and the protection of responders at the well site, Addendum III still resulted in a reduction in the total amount of dispersants applied. Following the issuance of Addendum III, the amount of dispersants used per application was reduced 55% (from a daily average of 5,046 gallons to 2,276 gallons).

In the period following Addendum III, the average daily amount of subsea dispersant applied did increase 12%, from 10,553 gallons to 12,041 gallons. But subsea dispersant is directly correlated with VOC levels at the well site, and these actions were taken for worker safety. The FOSC worked with BP to ensure that subsea dispersant levels were kept at the lowest level necessary.

Significant dispersant operations ended on 15 July 2010 with the capping of the well. The last dispersant application was 200 gallons on 19 July 2010.

We will provide additional information via separate correspondence no later than October 1, 2010. In the interim, we are happy to meet with your staff to answer any questions you may have.

Sincerely,

T. W. ALLEN
Admiral, U. S. Coast Guard (Ret.)
National Incident Commander

Enclosures: (1) Dispersant Usage Summary
(2) Dispersant Use Request and Authorization June 10, 2010
(3) Dispersant Use Request and Authorization June 11, 2010
(4) Dispersant Use Request and Authorization June 12, 2010
(5) Dispersant Use Request and Authorization June 13, 2010
(6) Dispersant Use Request and Authorization June 14, 2010
(7) Dispersant Use Request and Authorization June 15, 2010
(8) Weekly Source Control Surface Dispersant Plan (June 10 through 16, 2010)
(9) June 4, 2010 Source Control Special Dispersant Request and Approval
(10) June 19, 2010 Source Control Special Dispersant Request and Approval
(11) June 15, 2010 Aerial Dispersant Plan Request and Approval
(12) Daily Dispersant Use Data

THE HONORABLE LISA JACKSON

U.S. EPA Administrator

Day 1, Panel 3: Dispersants

Anticipated Focus:

Administrator Lisa Jackson will discuss the role that EPA played in approving the use of dispersants, both on the surface and subsea, during the Deepwater Horizon spill response. She will explain her understanding of EPA's authority with respect to the use of dispersants; how the decision-making process functioned during the spill; and, in particular, her involvement with the novel issue of subsea dispersant use. Jackson can also share her views on ways to improve the testing and preapproval process to ensure that future decisions regarding dispersant use are fully informed.

Biography:

Administrator Lisa Jackson leads EPA's efforts to protect the health and environment for all Americans. She and a staff of more than 17,000 professionals are working across the nation to usher in a green economy, address health threats from toxins and pollution, and renew public trust in EPA's work. As Administrator, Jackson has pledged to focus on core issues of protecting air and water quality, preventing exposure to toxic contamination in our communities, and reducing greenhouse gases. She has promised that all of EPA's efforts will follow the best science, adhere to the rule of law, and be implemented with unparalleled transparency.

Jackson is the first African-American to serve as EPA Administrator. She has made it a priority to focus on vulnerable groups including children, the elderly, and low-income communities that are particularly susceptible to environmental and health threats. In addressing these and other issues, she has promised all stakeholders a place at the decision-making table.

Before assuming her current position, Jackson served as Chief of Staff to New Jersey Governor Jon S. Corzine and Commissioner of the state's Department of Environmental Protection (DEP). Prior to joining DEP, she worked for 16 years as an employee of the U.S. EPA. Jackson is a *summa cum laude* graduate of Tulane University. She also holds a master's degree in chemical engineering from Princeton University.

REAR ADMIRAL MARY E. LANDRY

Commander, Eighth Coast Guard District, United States Coast Guard

Day 1, Panel 3: Dispersants

Anticipated Focus:

Rear Admiral Mary E. Landry will discuss how, as the Federal On-Scene Coordinator for the spill, she made decisions regarding the use of dispersants, in particular regarding the novel issue of subsea use. Landry will explain her understanding of the Federal On-Scene Coordinator's authority with respect to dispersant use, how the decision-making process actually functioned during the spill, and whether the process adhered to the established National Contingency Plan protocol. She will also share her views on how the dispersant approval process can be improved. Finally, Landry will discuss the role that BP played in decisions to use dispersants.

Biography:

Rear Admiral Mary E. Landry serves as the Commander of the Eighth Coast Guard District and Commander of Task Force 189.8, headquartered in New Orleans. As District Commander, Landry is responsible for U.S. Coast Guard operations covering 26 states, more than 1,200 miles of coastline and 10,300 miles of inland waterways from Florida to Mexico. This area includes the entire navigable lengths of the Mississippi, Ohio, Missouri, Illinois and Tennessee River systems.

Landry arrived in the Eighth District having served for the two years as the Coast Guard's Director of Governmental and Public Affairs, stationed at Coast Guard Headquarters in Washington, DC. Landry has served the majority of her career in the Marine Safety field. She has held various assignments on the East Coast, West Coast, Gulf Coast and Hawaii. She was the Executive Officer of Marine Safety Office (MSO) Boston during the 9/11 attacks and oversaw the federal response to the Buzzard's Bay oil spill in southeastern Massachusetts during her tour as Commanding Officer of MSO Providence, Rhode Island. Most recently she served as the Federal-On-Scene-Coordinator for the Deepwater Horizon incident in the Gulf of Mexico.

Landry completed Officer Candidate School in 1980. A native of Buffalo, New York, Landry graduated from the State University of New York at Buffalo in 1978 and worked for the city's mayor prior to joining the Coast Guard. She has a Master of Arts in Management from Webster University and a Master of Marine Affairs from the University of Rhode Island. Landry is a National Security Fellow, earning this distinction at Harvard University's John F. Kennedy School of Government in 2000. Her military decorations include the Legion of Merit (three awards), Meritorious Service Medal, Coast Guard Commendation Medal (three awards), 9-11 Medal, and Achievement Medal.

DR. RONALD TJEERDEMA

Professor and Chair, Department of Environmental Toxicology, University of California, Davis

Day 1, Panel 3: Dispersants

Anticipated Focus:

Dr. Ronald Tjeerdema will share his expertise as a toxicologist who has researched dispersants for over two decades. He will discuss the scientific aspects of the decision to use Corexit 9500, as well as the potential impact of dispersants and dispersed oil on the Gulf ecosystem. Tjeerdema will comment on his participation in the Coastal Response Research Center's Deepwater Horizon Dispersant Use Meeting at Louisiana State University in May 2010, which was convened during the spill to evaluate decisions regarding dispersant use. Finally, Tjeerdema will discuss his experience as a member, in the early 1990s, of the Chemical Response to Oil Spill: Ecological Effects Research Forum, which sought to standardize testing methods for dispersant research.

Biography:

Dr. Ronald Tjeerdema investigates the metabolic actions of toxic chemicals in aquatic animals using nuclear magnetic resonance (NMR)-based metabolomics (environmental metabolomics). His work also explores the biochemical actions of toxic chemicals in aquatic animals using in vivo NMR, as well as the kinetics and biotransformation of pesticides and petroleum hydrocarbons in aquatic animals. Other current research explores the influence of surfactants on the bioavailability of petroleum hydrocarbons in aquatic systems. Tjeerdema investigates the dissipation of herbicides via volatilization, soil sorption, photodegradation and microbial degradation under rice field conditions. His research also focuses on the fate of pesticides and petroleum hydrocarbons in marine mussels and sediments.

Tjeerdema directs the Marine Pollution Studies Laboratory at the University of California, Davis. He is a member of the graduate groups in agricultural and environmental chemistry, ecology, and pharmacology and toxicology.

Tjeerdema holds a Ph.D. in pharmacology and toxicology from the University of California, Davis. He has a M.S. in pharmacology from the University of California, Santa Barbara, and B.S. degrees in natural resources and wildlife management from Humboldt State University.

THE HONORABLE KEN SALAZAR

U.S. Secretary of the Interior

Day 1, Panel 4: Future of Offshore Drilling

Biography:

Ken Salazar, a fifth-generation Coloradan, was confirmed as the 50th Secretary of the U.S. Department of the Interior on Jan. 20, 2009, in a unanimous vote by the U.S. Senate. Prior to his confirmation, Salazar served as Colorado's 35th U.S. senator, winning election in November 2004 and serving on the Finance Committee, which oversees the nation's tax, trade, social-security, and health-care systems. He also served on the Agriculture, Energy and Natural Resources, Ethics, Veterans Affairs and Aging Committees.

As a U.S. Senator, Salazar was a leader creating and implementing a vision for a renewable-energy economy that is less dependent on foreign oil. He was involved in every major bipartisan legislative effort on energy since 2005, and helped craft the Renewable Fuels, Consumer Protection, and Energy Efficiency Act of 2007. From 1999 to 2004, Salazar served as Colorado's thirty-sixth Attorney General, winning statewide elections in 1998 and 2002. He chaired the Conference of Western Attorneys General and received the Profiles in Courage award from his fellow state attorneys general for his dedication to preserving and promoting the rule of law.

From 1987 to 1994 Salazar served in the Cabinet of Gov. Roy Romer as chief legal counsel and executive director of the Colorado Department of Natural Resources, where he crafted reforms for oil, mining, and gas operations to better protect the environment and the public. Salazar also worked for 11 years as a water and environmental lawyer with some of the top firms in the West. During his time in the private sector and as Colorado's Attorney General, Salazar worked on cases from the trial courts to the Colorado and U.S. Supreme Courts. He received a political science degree from Colorado College, and a law degree from the University of Michigan.

THE HONORABLE KEN SALAZAR

U.S. Secretary of the Interior

Day 1, Panel 4: Future of Offshore Drilling

Anticipated Focus:

We invited Secretary Ken Salazar to speak about the challenges of drilling and oil spill response in the Arctic. He accepted that invitation but indicated that he also wished to address broader issues related to the future of offshore drilling. Salazar is still determining which specific topics he will cover. We anticipate that he may discuss one or more of the following subjects:

Interior's Role in the Deepwater Horizon Response: The Department of the Interior's high-level involvement in the response to the Deepwater Horizon explosion and spill began almost immediately. Deputy Secretary of the Interior David Hayes was deployed to the Gulf region to help with coordination and response on April 21, 2010. Hayes has told Commission staff that senior leadership from the Department remained very involved in the effort to stop and contain the flow of oil from the Macondo well over the following months, with Salazar the individual who suggested that Secretary of Energy Stephen Chu become involved as well. Hayes also notes that the Department of the Interior, through MMS, was required to approve all of BP's subsea operations near the Macondo well in the period immediately following the explosion. It presently remains unclear how MMS's oversight of BP evolved after the National Incident Command took charge of the response. Finally, Salazar's May 2, 2010 comment that the government would keep its "boot on the neck" of BP has been associated with the administration's effort to demonstrate that it, not BP, was in charge of the spill response. Salazar may speak about his role—and that of the Department more broadly—in the days, weeks, and months following the Deepwater Horizon explosion.

Transforming the Minerals Management Service into the Bureau of Ocean Energy Management, Regulation, and Enforcement: In May 2010, the Department of the Interior announced it was restructuring the Minerals Management Service (MMS) and renaming it the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE). The reorganization focused on (1) separating the safety and environmental enforcement roles of the agency from the revenue and leasing roles; (2) providing more resources to federal inspectors; and (3) expanding the agency's ability to review exploration plans. Following a critical inspector general report about ethical lapses at MMS, Salazar also promised to end overly cozy relationships between individuals at the agency and individuals from industry. In July, Michael Bromwich, the newly appointed Director of BOEMRE, submitted for the review of Salazar and Congress his plan to create three separate offices within the agency. These offices will respectively be responsible for (1) the collection of revenue from oil and gas leases; (2) the management of energy resources along the Outer Continental Shelf; and (3) the enforcement of safety and environmental standards. In early September, the Outer Continental Shelf Safety Oversight Board released a report recommending changes to BOEMRE so as to strengthen permitting, inspections, enforcement, and environmental protection. Bromwich responded to the report by issuing an

implementation plan indicating that he agreed in full with the Oversight Board's recommendation and that many of the reforms suggested were already underway. Salazar may speak about the ongoing reorganization efforts at MMS/BOEMRE and the challenges that the reorganized agency faces.

The Deepwater Drilling Moratorium: In late May 2010, Salazar directed MMS to issue a six-month moratorium on all deepwater drilling (drilling at a water depth of more than 500 feet) in the Gulf of Mexico and the Pacific Ocean. Department officials justified the moratorium as providing time for this Commission to begin its work and for MMS to undertake needed safety reforms. The moratorium faced immediate criticism from the oil and gas industry and from affected communities in the Gulf of Mexico, which feared a severe economic impact from a decrease in drilling activity. Hornbeck Offshore Services challenged the moratorium in the United States District Court for the District of Louisiana. The court ruled that the moratorium was arbitrary and capricious under the Administrative Procedure Act and enjoined its continued enforcement. The Department immediately appealed and rewrote the moratorium to permit deepwater drilling to proceed if certain conditions were met. The new moratorium expires November 30, 2010, and litigation challenging it is ongoing. The Department of the Interior and Salazar continue to defend the moratorium as appropriate to ensure that oil and gas companies have adequate safety measures in place and are better prepared to respond to and contain blowouts and spills. Recently, Michael Bromwich, Director of BOEMRE, has been conducting forums around the country in order to make a recommendation to Secretary Salazar by the end of September about when and how to end the moratorium. Bromwich has stated that he has not seen an adequate case made for extending the moratorium beyond November 30, although even after the moratorium is lifted, firms will need to comply with newly enacted safety requirements in order to restart drilling. Salazar may discuss the initial decision to implement the moratorium, the decision to adjust but continue the moratorium after the district court ruling, and his views on why a six-month drilling pause was appropriate in the wake of the Deepwater Horizon spill.

Exploration in the Arctic: Prior to the Deepwater Horizon explosion and ensuing spill, production drilling was already underway in the Beaufort Sea, and MMS had approved Shell's plan to drill three exploratory wells in the Chukchi Sea. Even as it approved Shell's three test wells, however, MMS cancelled oil lease sales in the Beaufort and Chukchi Seas scheduled by the previous administration and suspended all new lease sales for two years to permit additional scientific study. Following the Deepwater Horizon spill, the Department of the Interior went further, forbidding all new drilling in the Arctic, including Shell's three exploratory wells. On September 3, 2010, during a trip to Alaska, Salazar announced that the Department of the Interior would not decide whether to allow exploration drilling for oil and gas in the Alaska Arctic outer continental shelf until it completed a review of issues relating to offshore drilling activities. The State of Alaska brought suit in federal district court, accusing the Department of imposing a de facto moratorium on drilling in Alaska without providing a formal appealable order. Salazar may speak about the Department's decisions regarding drilling in the Beaufort and Chukchi Seas both before and after the Deepwater Horizon spill, including how the Deepwater Horizon spill has altered the Department's views on drilling in the Arctic.

MMS reorganization

THE SECRETARY OF THE INTERIOR

WASHINGTON

ORDER NO. 3299

Subject: Establishment of the Bureau of Ocean Energy Management, the Bureau of Safety and Environmental Enforcement, and the Office of Natural Resources Revenue.

Sec. 1 **Purpose.** The purpose of this Order is to separate and reassign the responsibilities that had been conducted by the Minerals Management Service into new management structures that will improve the management, oversight, and accountability of activities on the Outer Continental Shelf; ensure a fair return to the taxpayer from royalty and revenue collection and disbursement activities; and provide independent safety and environmental oversight and enforcement of offshore activities.

Sec. 2 **Authority.** This Order is issued in accordance with the authority provided by Section 2 of the Reorganization Plan No. 3 of 1950 (64 Stat. 1262).

Sec. 3 **Bureau of Ocean Energy Management.** Through this Order, and in accordance with the schedule set forth in Section 9, a Bureau of Ocean Energy Management will be established in the Department. The Bureau of Ocean Energy Management will be led by a Director, and it will be under the supervision of the Assistant Secretary – Land and Minerals Management. The Bureau of Ocean Energy Management will exercise the conventional (e.g., oil and gas) and renewable energy-related management functions of the Minerals Management Service not otherwise transferred pursuant to this Order including, but not limited to, activities involving resource evaluation, planning, and leasing.

Sec. 4 **Bureau of Safety and Environmental Enforcement.** Through this Order, and in accordance with the schedule set forth in Section 9, a Bureau of Safety and Environmental Enforcement will be established in the Department. The Bureau of Safety and Environmental Enforcement will be led by a Director, and it will be under the supervision of the Assistant Secretary – Land and Minerals Management. The safety and environmental enforcement functions of the Minerals Management Service including, but not limited to, the authority to inspect, investigate, summon witnesses and produce evidence, levy penalties, cancel or suspend activities, and oversee safety, response, and removal preparedness will be exercised by the Bureau of Safety and Environmental Enforcement.

Sec. 5 **Office of Natural Resources Revenue.** Through this Order, and in accordance with the schedule set forth in Section 9, the Office of Natural Resources Revenue will be established in the Department. The Office of Natural Resources Revenue will be led by a Director and it will be under the supervision of the Assistant Secretary – Policy, Management and Budget. The royalty and revenue management functions of the Minerals Management Service including, but not limited to, royalty and revenue collection, distribution, auditing and compliance,

investigation and enforcement, and asset management for both onshore and offshore activities, are hereby transferred to the Office of Natural Resources Revenue.

Sec. 6 **Compliance with Safety, Environmental, and Conservation Laws.** The Assistant Secretary – Land and Minerals Management and the Assistant Secretary – Policy, Management and Budget will take appropriate steps to ensure that this reorganization will provide that agency decisions are made in compliance with all applicable safety, environmental, and conservation laws and regulations, and that all reviews and consultations are conducted in an independent, comprehensive, and scientifically-sound manner.

Sec. 7 **Administrative Provisions.** The Assistant Secretary – Land and Minerals Management and the Assistant Secretary – Policy, Management and Budget will take appropriate steps to effect the transfer of administrative and other functions, personnel, funds, and property to implement the provisions of this Order.

Sec. 8 **Revocation.** Through this Order, and in accordance with the schedule set forth in Section 9, the responsibilities of the Minerals Management Service are hereby separated and reassigned. Applicable provisions of Secretarial Order No. 3071, including all amendments, and Secretarial Order No. 3087, including all amendments, are hereby revoked in accordance with the terms set forth herein.

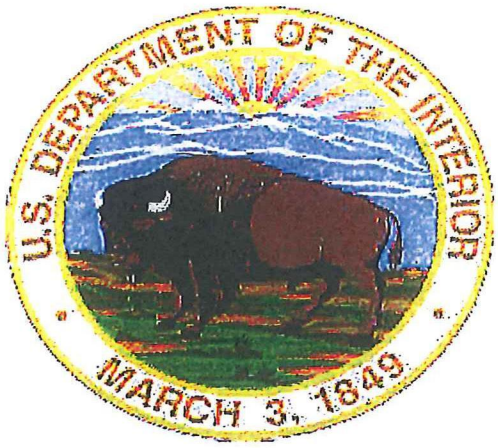
Sec. 9 **Effective Date.** The Assistant Secretary – Land and Minerals Management and the Assistant Secretary – Policy, Management and Budget will develop and report to the Secretary additional details regarding this reorganization. They will develop a schedule within thirty (30) days for the implementation of this Order in consultation with the White House Office of Management and Budget and applicable Congressional committees with responsibilities over these functions.

The provisions of this Order will remain in effect until publication of the Departmental Manual or until it is amended, superseded, or revoked, whichever occurs first.

Ken Salazar

Secretary of the Interior

Date: MAY 19 2010



U.S. Department of the Interior
Outer Continental Shelf Safety Oversight Board

Report to Secretary of the Interior Ken Salazar

September 1, 2010

Wilma A. Lewis, Assistant Secretary for Land and Minerals Management, Chair
Mary L. Kendall, Acting Inspector General
Rhea S. Suh, Assistant Secretary for Policy, Management and Budget

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I. Introduction

A. Background

The *Deepwater Horizon* tragedy of April 20, 2010, took 11 lives, caused the destruction and sinking of an offshore drilling rig, led to the release of approximately 4.9 million barrels of oil, and significantly disrupted the Gulf of Mexico region's economy and environment. Recognizing that oil and gas remain an important part of the Nation's energy economy, the government has begun to change laws, regulations, and organizational structures in an effort to prevent such catastrophic occurrences in the future.

The accident and ensuing spill challenged 40 years of generally accepted belief that offshore operations could occur safely under existing regulation and oversight. In the new context for offshore development that became evident even in the earliest days after the rig explosion and sinking, Interior Secretary Ken Salazar ordered an immediate review of Federal offshore oil and gas programs. Among the many actions taken by Secretary Salazar in the aftermath of the accident was the creation on April 30, 2010, of an Outer Continental Shelf (OCS) Safety Oversight Board (Board), consisting of Wilma A. Lewis, Assistant Secretary for Land and Minerals Management (ASLM), Chair; Mary L. Kendall, Interior Department Acting Inspector General; and Rhea S. Suh, Assistant Secretary for Policy, Management and Budget (ASPMB).[1]

In addition to other duties, the Secretary charged the Board with providing recommendations to improve and strengthen the Department's overall management, regulation, and oversight of OCS operations, including undertaking further audits or reviews, and reviewing existing authorities and procedures. This document responds to the Secretary's request for a report from the Board.

B. Context of the Report

This report is one of numerous government-initiated actions and activities intended to enhance safety in the aftermath of the *Deepwater Horizon* accident, including the following:

- On May 14, 2010, Council on Environmental Quality (CEQ) Chair Nancy Sutley and Secretary Salazar announced a review of the former Minerals Management Services' (MMS) National Environmental Policy Act (NEPA) policies, practices and procedures. The CEQ report was issued on August 16, 2010.[2]
- On May 19, 2010, Secretary Salazar ordered the longer-term reorganization of the former MMS into two new bureaus (the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement) under the ASLM. MMS's revenue management functions will be transferred to a new Office of Natural Resources Revenue, to be housed in the Office of the ASPMB.[3] An initial report on the planned implementation of the

[1] Secretarial Order No. 3298 (April 30, 2010).
[2] "Report Regarding the Minerals Management Service's National Environmental Policy Act Policies, Practices, and Procedures as They Relate to Outer Continental Shelf Oil and Gas Exploration and Development" (August 16, 2010).
[3] Secretarial Order No. 3299 (May 19, 2010).

reorganization was submitted to the Secretary on July 14, 2010.[4] Implementation steps are ongoing.

- On May 21, 2010, President Obama created the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling. This Commission has begun its work and will develop findings and recommendations.
- On May 27, 2010, Secretary Salazar submitted a report to the President on immediate, short-term and long-term safety measures.[5] The recommendations in that report are being implemented.
- On June 18, 2010, Secretary Salazar abolished MMS and transferred its functions to the new Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE).[6]
- On July 12, 2010, Secretary Salazar ordered a suspension of deepwater drilling while immediate safety concerns are addressed.[7] The BOEMRE Director is conducting public meetings to gather information as a precursor to preparing a report with recommendations on deepwater drilling.
- A joint United States Coast Guard (USCG)/BOEMRE Marine Board investigation of the root causes of the *Deepwater Horizon* accident is underway.
- Secretary Salazar has commissioned an independent study by the National Academy of Engineering to analyze root causes of the *Deepwater Horizon* accident and provide recommendations.
- Secretary Salazar requested that the Office of Inspector General (OIG) investigate any deficiencies in MMS policies and practices that may have contributed to the *Deepwater Horizon* accident.
- Congress is considering legislating new measures for offshore oil and gas development, including some of the reforms referenced in this report.

Some of the issues examined in this report are similar to issues identified in the context of both the BOEMRE reorganization and other initiatives aimed at enhancing the safety of OCS operations in response to the *Deepwater Horizon* accident. A combination of regulatory, structural, and statutory solutions to some of these issues is now being explored or is already moving forward.

Prior to the *Deepwater Horizon* explosion on April 20, 2010, the Department of the Interior had initiated several reforms involving the management of offshore energy resources. These new measures included: reforms to the former MMS's ethics program; termination of the Royalty in Kind program; a new approach to OCS management emphasizing scientifically grounded and environmentally sound development of oil and gas resources, together with a strategy that calls for analyzing the possible development of new areas offshore, exploring frontier areas, and protecting places that are not appropriate for drilling; development and implementation of renewable energy programs; and a review of oil and gas royalty rates. These reform measures and those initiated in the aftermath of the *Deepwater Horizon* accident are part of the Department's ongoing reform agenda.

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[4] "Implementation Report - Reorganization of the Minerals Management Service" (July 14, 2010).
[5] "Increased Safety Measures for Energy Development on the Outer Continental Shelf" (May 27, 2010).
[6] Secretarial Order No. 3302 (June 18, 2010).
[7] The Secretary's decision memorandum on the offshore drilling suspension is available at http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=38375.

Offshore oil and gas development constitutes approximately 30% of domestically produced oil and 11% of the domestic natural gas supply. The vast majority of this production occurs in the Central and Western Gulf of Mexico (GOM). In achieving such levels of production, the GOM offshore oil and gas industry has, in recent decades, reached farther offshore and deeper undersea. Many of the facilities are larger, more complex, more technologically sophisticated, and more distant than ever before. Simultaneously, government oversight of the prolific energy resources of the GOM has become more complex and challenging. In view of the many lessons that can and should be learned from the *Deepwater Horizon* accident, BOEMRE has the opportunity to make systemic changes that will help create a better and more effective regulatory and oversight program.

C. Development of the Report

Secretary Salazar charged the Board with providing recommendations to improve and strengthen the Department's overall management, regulation, and oversight of OCS operations. The Secretary also separately asked the OIG to determine, among other things, whether there are deficiencies in BOEMRE policies and practices that should be addressed in order to ensure that operations on the OCS are conducted in a safe manner, and protective of human life, health, and the environment.

Since these requests by the Secretary were similar in nature, the OIG agreed to lead a Joint Team of OIG and ASLM Energy Reform Team members in collecting and analyzing information and providing the Board with proposed recommendations. As an initial step, the Board identified broad topics that it determined to be relevant to the regulation of offshore operations by BOEMRE – specifically Permitting, Inspections, Enforcement, Environment, Post-Accident Investigations, and Safety.[8] The Board also provided the Joint Team with a series of questions related to each of the identified subject areas that served as a catalyst for the review.

The Joint Team conducted a review to address the six topic areas. The Joint Team's field work included interviews of over 140 BOEMRE employees; two online surveys sent to nearly 400 BOEMRE employees;[9] review of over 2,000 documents, including statutes, regulations, policies, procedures, and guidance; and detailed analysis and synthesis of the information developed from this work. The Joint Team also drafted issue papers with proposed recommendations to advance the most pressing and pertinent issues that it developed in the course of nine weeks, ending July 30, 2010.

Collaterally, at the request of the Board, staff of the Office of Policy Analysis (PPA), within the Office of the ASPMB, gathered information and conducted research that compared the inspection, enforcement and post-accident review programs of regulatory systems among a variety of federal agencies of the United States government (the Nuclear Regulatory Commission, Federal Aviation Administration, Mine Safety and Health Administration, and Occupational Safety and Health Administration) as well as the oil and gas management regime

[8] The issues reviewed under "Safety" are addressed in the Environmental Stewardship section of this report.

[9] Surveys were sent to 199 personnel involved in the inspections, enforcement, post-accident, and investigations processes, 126 of whom responded (63%). Separately, a different survey was sent to 193 personnel involved in the conduct, oversight, and support of environmental review and compliance activities, as well as leasing staff who reported to the same regional supervisors; 108 responded (53%).

of the United Kingdom, which oversees development of offshore oil and gas resources in the North Sea. The result was a comparative analysis of these regulatory models for the Board's consideration.

The Board engaged in a detailed review of the PPA and Joint Team work products, in consultation with the PPA Team, the Joint Team, ASLM senior staff, BOEMRE senior staff, and two consulting subject-matter experts who had been senior officials of the former MMS. As a result of this combined effort, a draft report was prepared. The draft was provided to senior officials within the Department, including the BOEMRE Director, for any comments. Following a review and discussion of the comments received, the Board finalized its report, which is presented in this document.

This report contains the results of a programmatic review of select BOEMRE functions. The resulting recommendations address both short-term and long-term efforts that BOEMRE should consider as it continues with its reforms. This report is intended to compliment, not duplicate, other reviews and work products, particularly the Secretary's May 27 Report to the President. Thus, although there is some overlap among issues discussed in this report and in other contexts, the Board seeks through this report to add value to the reform agenda by focusing on certain areas that are not the primary focus of other efforts.

The OIG will continue its analysis of the information collected during this effort and will issue a supplemental report containing additional supporting information and analysis. The OIG may also continue to pursue a number of issue areas it has determined worthy of additional review.

D. Analysis and Recommendations

Overall, the Joint Team found the BOEMRE employees it interviewed to be a dedicated, enthusiastic cadre of professionals who want nothing more than to do their jobs effectively and efficiently and to see their Bureau reorganize into a robust, high-performing and respected organization. However, BOEMRE employees also provided ample information about the weaknesses of the program and operations, and how they might be addressed. This report contains many of their observations, and the Board's recommendations that emanated from those observations.

In the following pages the Board presents a suite of issues and recommendations (restated in the Appendix). By their nature, and consistent with the Board's mandate, the report is focused on change and improvement. In the aggregate, the findings and recommendations can be considered by BOEMRE management and staff as a framework for improvement that would create more accountability, efficiency, and effectiveness in a bureau charged with significant responsibilities.

Some of the recommendations in this report and the actions identified to address them are reliant on an infusion of funding and staffing. Those needs will be addressed by the Department and the Administration through a FY 2011 budget amendment, realignment of resources in the existing budget, and the annual budget process.

The recommendations range from improved consistency and communication of BOEMRE's operational policies to technology improvements and day-to-day management in the field. Inspections and enforcement—from personnel training to the deterrent effect of fines and civil penalties—also need attention. In addition, BOEMRE must be diligent to achieve the stewardship balance between development and environmental responsibilities envisioned in its statutes.

One of the major cross-cutting themes of the Board's recommendations is providing more support for BOEMRE personnel, in the form of training and education, management commitment, and professional growth and development. BOEMRE responsibilities have expanded in scope and complexity to such an extent that BOEMRE must increase and develop its staff to meet new challenges.

Above all, through each of the topics addressed in this report runs a single theme: BOEMRE must pursue, and industry must engage in, a new culture of safety in which protecting human life and preventing environmental disasters are the highest priority, with the goal of making leasing and production safer and more sustainable. The purpose of a broad safety culture program is to create and maintain industry, worker, and regulator awareness of, and commitment to, measures that will achieve human safety and environmental protection, and to make sure that where industry fails, BOEMRE will respond with strong enforcement authorities.

Forging a new safety culture cannot be achieved by government alone. The Board recognizes that the federal agency for offshore management must carry the flag for safety culture, through its own actions, through its rules and enforcement, and through its establishment of priorities. However, the Board believes that industry, as the lead player in offshore oil and gas development, has a pivotal role to play as well. Indeed, industry must make a widespread, forceful and long-term commitment to cultivating a serious approach to safety that sets the highest safety standards and consistently meets them. Ultimately, for a new and robust safety culture to take root, industry must not only follow rules, it must assume a meaningful leadership role.

II. Permitting: Resources and Protocol for Permit Review

Issue

Gulf of Mexico (GOM) district offices are challenged by the volume and complexity of permit applications and the lack of a standardized engineering review protocol. In addition, the Pacific Region's permitting staff is facing significant succession issues.

Background

The volume of production activity in the GOM has increased significantly in the last several years. However, the workforce associated with regulating the day-to-day activities of the oil and gas industry (particularly the review of Applications for Permits to Modify (APMs)) has not increased proportionally to the work demands. In addition, the sheer volume of requests creates a high pressure work environment that can lead to challenges in balancing the need to conduct an adequate analysis for each modification decision or permit with the need to be responsive to requests from industry. Further, there are succession issues in the Pacific Region that may also apply to BOEMRE's other regions.

The oil and gas industry works around the clock. After regular work hours, GOM District office staff maintain their coverage by requiring an engineer to be available on-call. The New Orleans District office, for example, receives approximately 15 to 20 after-hour calls per week. The on-call responsibility is rotated among the various senior engineers (GS-13) at each district office. On-call engineers are provided with office-issued cell phones and government laptops, but they are not allowed to access the permit database from off-site locations.

Analysis/Discussion

- With increasing workloads, GOM district offices do not have a sufficient number of engineers to efficiently and effectively conduct permit reviews. For example, APMs have increased by 71% from 1,246 in 2005 to 2,136 in 2009 in the New Orleans District.
- In the Pacific Region, staffing will be an issue because 8 of the 10 current permitting employees will be eligible for retirement within the next 2 ½ years.
- GOM district offices do not have a standard practice to address operators who "shop around" for regulatory approval for their oil and gas operations and who contact district offices outside the appropriate jurisdictional area. Engineers stated that some operators call various district offices to find an engineer who will eventually give approval. For example, during the current drilling suspension, an operator contacted one district office for a special drilling departure, but was told to wait. The operator then contacted another district office and received approval. The operator was eventually told not to drill, but this example illustrates the lack of coordination and standardization among the district offices.
- GOM on-call engineers are handicapped because they are not allowed to access the permit database from off-site due to security concerns. This permit database provides the

application forms and background data on operational activities in the GOM that assist engineers in making informed permit decisions.

Recommendations

1. Review permit staffing needs in the GOM district and regional offices to ensure that staffing levels are commensurate with increasing workloads.
2. Develop a succession plan for BOEMRE staff in all regions.
3. Develop a comprehensive and current handbook to compile and standardize policies and practices designed to assist permit reviewers in carrying out their responsibilities.
4. Review and revise the permit review protocols to ensure that: (a) permit requests from operators and district responses are documented promptly and properly; (b) BOEMRE engineers have appropriate access to permit databases after hours; and (c) procedures are established that prevent "engineer shopping" by operators.
5. Reexamine after-hours permit review services; the means by which any such services should be provided (*e.g.*, on-call or in-office staffing); and the feasibility of limiting its use by requiring operators to submit non-emergency requests and requests that could be reasonably anticipated during normal business hours.

Note: Recommendations that address deficiencies in the permitting regulations are discussed in the "Environmental Stewardship: Regulatory Framework" section.

III. Inspections: Program Structure, Training, Personnel and Resources, Management Support

Issue

Inspectors are an important line of defense for promoting safety and environmental protection in offshore oil and gas development. Currently, however, certain challenges affect the overall effectiveness of the inspection program. Specifically, inspectors (a) are part of a program structure that is ineffective in facilitating the elevation of issues or concerns up the management chain; (b) begin and continue their jobs with no standardized training, testing, or certification; (c) operate with minimal resources; and (d) sometimes operate without strong management support.

A. Inspections: Program Structure and Effectiveness

Background

Inspectors work out of district offices in the three agency regions (the GOM Region, the Pacific Region, and the Alaska Region), with most of the inspectors in the Gulf. Every GOM district office has a Lead Inspector and Supervisory Inspector. The program structure through which concerns or issues encountered in a district office can be elevated to the regional offices, or up the management chain to the headquarters office for review and resolution, is not effective. For example, if an Incident of Noncompliance (INC) is rescinded by the district manager and the inspector disagrees with that decision, there is no viable avenue available for inspectors to raise their concerns. There appear to be few established channels of communication among inspectors to share professional and technical information and concerns, vet common issues and develop solutions, and make recommendations to management. Inspectors have little opportunity to work with other program specialists on a routine basis, even when they share common concerns. As a result, policies and enforcement mechanisms vary among the GOM districts and the regions, and there is no formal process to promote standardization, consistency, and operational efficiency.

The Pacific Region has a more structured program than the GOM, with consolidated policies and practices for the inspectors. The Pacific Region's "Offshore Inspection Program Policies and Procedures Document," dated February 2010, provides the framework for the Region's program.

Analysis/Discussion

- BOEMRE does not have a formal, bureau-wide compilation of rules, regulations, policies, or practices pertinent to inspections, nor does it have a comprehensive handbook addressing inspector roles and responsibilities. For example, although the informally acknowledged policy of GOM is to inspect drill rigs once a month, none of those interviewed could provide a written directive to support this policy.
- Inspectors meet once every two years and consider these meetings valuable forums for sharing information and assessing program needs. Yet, during interviews, inspectors in some districts expressed the need for more regular local office meetings to discuss

current work-related issues, such as new management directives and technical issues. In addition, a number of inspectors expressed the desire to work with other districts to learn how they operate.

- Several inspectors reported that a lack of adequate advance planning leads to inefficient scheduling of personnel and resources. For example, inspectors may travel to one facility more often than needed due to helicopter schedules because it is difficult to coordinate air transportation to a deepwater facility when traveling with others who are inspecting facilities closer to shore.
- Ninety percent of inspectors responding to the survey identified a critical need for more unannounced inspections. However, unannounced inspections are rarely performed. In the GOM, such inspections are limited by United States Coast Guard (USCG) security restrictions on facilities that are required to maintain a Maritime Security plan (MARSEC facilities). District offices are required to give 24 hours notice prior to conducting an inspection on these facilities. A 2007 GOM directive also states that a 20-minute followed by a 5-minute notification should be given to all other facilities. A 2005 GOM directive required only a 5-minute notification. The definition of what constitutes an unannounced inspection and the conditions under which it could be conducted also varied from office to office. For example, one district office indicated that inspectors could land on some platforms without any notification, while another district office stated that a 20-minute advance notice would be given. Others interviewed stated that the requirements for helicopter pilots to call ahead before landing precluded unannounced inspections. Finally, documents, including the 2007 GOM directive, indicate the existence of special notification arrangements between BOEMRE and certain companies.
- BOEMRE inspectors are not required to witness operations, although they will do so when operations are in progress during an inspection. Several inspectors reported that operators would close down work in certain areas when the inspectors were on the facility.
- In 2009, 41% of inspections were conducted by single inspectors. Most inspectors interviewed said that two-person teams would increase efficiencies, eliminate reliance on an operator representative for observations on safety tests, improve the thoroughness of the inspection, and reduce the ability of operators to successfully pressure an inspector not to issue an INC.
- A comparative analysis of regulatory agencies revealed that both the Nuclear Regulatory Commission (NRC) and the Mine Safety and Health Administration (MSHA) rotate inspectors among facilities to help maintain their independence.

Recommendations

1. Develop an inspection program with strong representation at all levels of the agency. The program should facilitate good intra-agency communication in order to promote consistency, effectiveness, and efficiency and provide strong support to the front-line inspectors.
2. Compile a comprehensive and current handbook of all policies and practices designed to assist inspectors in carrying out their responsibilities.
3. Clarify the criteria for what constitutes unannounced inspections. Review and clarify the current policies under which unannounced inspections can be performed, including the USCG MARSEC restrictions, and special notification arrangements with certain companies, so that unannounced inspections can be conducted to the greatest extent practicable.
4. Identify critical operations conducted on all BOEMRE regulated facilities, and require that operators notify the agency about the timing of these operations so that inspectors can view operations first hand to the greatest extent practicable.
5. Evaluate the advantages of conducting inspections in two-person teams instead of individually.
6. Analyze the benefits of obtaining electronic access to real-time data transmitted from offshore platforms/drilling rigs, such as operators' surveillance cameras, blow-out preventer monitoring systems, and/or other automated control and monitoring systems, to provide BOEMRE with additional oversight tools.
7. Examine the viability of performing multi-day inspections of critical operations on rigs and platforms.
8. Evaluate the advantages of rotating inspectors among districts and regions.

B. Inspections: Training and Professional Development

Background

BOEMRE does not have a formal training and certification program for its inspectors. Further, BOEMRE's policy and organizational structure leave little opportunity for higher education opportunities and career advancement for inspectors.

New BOEMRE inspectors are inducted into the inspection program through on-the-job training provided by more experienced inspectors. The amount of time and the structure of this training vary from office to office and from inspector to inspector. While hands-on experience is important, it does not address the need for substantive, consistent training in all aspects of the job, including regulations, standards, policies, technical updates and other information. In addition, there is no formal process for testing and certification; an inspector is allowed to work on his own based on office policy and/or the recommendation of the training inspector. Since BOEMRE has no formal training, testing, and certification process, the agency tends to look for new inspectors who already have experience, usually through prior work in the oil and gas industry.

Analysis/Discussion

- Almost half of the inspectors surveyed do not believe that they have received sufficient training.
- BOEMRE does not have an oil and gas inspection certification program. By contrast, the Bureau of Land Management (BLM) has a certification program that combines classroom instruction and on-the-job experience. A formal technical review (an exam) is required of each inspector in order to be certified. The program takes over one year to complete.
- BOEMRE does not provide formal training specific to the inspections process, and training does not keep up with changing technology. Some inspectors noted that they rely on industry representatives to explain the technology at a facility.
- Inspectors do not receive Student Loan Repayment Program benefits. Participation in this program could provide inspectors an incentive to obtain higher education and improve their skill sets, as well as increase their opportunities for promotion.
- Inspectors do not receive a salary differential for their work under hazardous conditions, although their jobs include exposure to conditions that could be considered hazardous.
- Previously, inspectors specialized in drilling or production facilities and were assigned accordingly, and the district offices had supervisory and lead inspectors in each discipline. For the past 15 years, however, the bureau's emphasis has been to cross-train inspectors on all inspection disciplines. Many inspectors said that receiving training in all inspection disciplines was beneficial and provided back-up within field offices, but that having experts in each of the various types of inspections was practical and efficient, and led to more effective inspections.
- Discussions with inspectors indicate that inspectors who identify their own training needs often are denied that training. To the extent training is provided, it is not always deemed particularly valuable, such as training offered on complex equipment that is geared to engineers, rather than to inspectors.

- BOEMRE does not have a formal program for recruiting and retaining the most qualified inspectors, nor is there a well-defined career ladder for inspectors. Currently, full performance for an inspector is at the GS-11 grade within a district office. GOM district offices have one lead and one supervisory inspector each, with performance grades of GS-12 and GS-13, respectively. There is no promotion potential above the district office for inspectors, nor are there opportunities to cross-train and move into related positions at higher grades or levels of the organization.

Recommendations

1. Implement a bureau-wide certification or accreditation program for inspectors. Consider partnering with BLM and its National Training Center to establish a DOI oil and gas inspection certification program, with training modules appropriate to the offshore environment as needed.
2. Develop a standardized training program similar to other Interior bureaus to ensure that inspectors are knowledgeable in all pertinent regulations, policies, and procedures. Ensure that annual training keeps inspectors up-to-date on new technology, policies, and procedures.
3. Develop Individual Development Plans for inspectors designed to achieve career advancement strategies. Such strategies should promote sound succession planning and foster employee development and satisfaction.
4. Expand, to the greatest extent practicable, the sources from which BOEMRE draws inspector applicants, and identify incentives to recruit and retain inspectors. Reevaluate whether inspectors can participate in the Student Loan Repayment Program and are eligible for hazard pay.
5. Consider developing more subject matter experts in each of the various types of inspections within district offices.

C. Inspections: Personnel and Resources

Background

Over the years, as BOEMRE downsized and industry activity increased, BOEMRE was left vulnerable to staffing issues. According to a 2007 management report submitted to MMS by management consultant LMI: "Since 1982, OCS leasing has increased by 200% and oil production has increased by 185%. Despite the recent and projected increase in leasing activities and oil and natural gas production, [minerals management] staffing resources have decreased by 36% since 1983."[10]

A robust inspection program needs to be sufficiently staffed and possess the tools necessary to do the job effectively. Wide disparities exist between the Pacific and the GOM regions, with the Pacific more fully staffed and equipped. However, interviews with Pacific inspections staff also revealed staff concerns regarding a perceived emphasis on the quantity, rather than quality, of inspections.

The Outer Continental Shelf Lands Act (OCSLA) requires annual scheduled inspections and periodic unannounced inspections of OCS oil and gas operations. In 2009, there were 97 operators producing oil and 106 operators producing gas in the GOM, and 6 operators producing oil and gas in the Pacific. In the GOM there are about 3,000 facilities. In addition to its own legal mandates, BOEMRE conducts inspections for the EPA on air quality and point-source discharges, for the USCG on safety, and for the Department of Transportation on pipelines—all without reimbursement.

Analysis/Discussion

- The Pacific Region employs 5 inspectors to inspect 23 production facilities—a ratio of 1 inspector for every 5 facilities. By contrast, the GOM employs 55 inspectors to inspect about 3,000 facilities—a ratio of 1 inspector for every 54 facilities.
- Inspectors also have collateral duties, such as conducting accident investigations, but sometimes lack the necessary experience, training, or time to fulfill these duties in addition to their inspection responsibilities.
- A substantial amount of on-site inspection time is used for conducting reviews of operator reports to ensure the operator has conducted and documented the required safety tests. Some production inspections may require up to 34 report reviews. Some operators are providing access to these reports online, which enables the inspectors to conduct their inspection work more efficiently.
- Pacific Region inspectors have laptop computers for easy access to regulations and standards, inspection forms, and the ability to enter and track data while in the field. GOM inspectors do not have this capacity.
- Many of the inspectors who were interviewed stated that the information system used to track inspection and enforcement data (Technical Information Management System

[10] Offshore Minerals Management Business Assessment and Alignment Report (May 2007).

(TIMS)) is not user friendly and requires manual processes. They further stated that the information is sometimes difficult to access, and some of the data are unreliable.

Recommendations

1. BOEMRE should undertake a comprehensive workforce and workload analysis of the inspection program, including succession planning, anticipated workload needs, and increased capacity, and implement appropriate recommendations.
2. Analyze ways to perform inspection activities more efficiently by using current technological tools, such as online review of reports and records and by using mobile technology in the field.
3. IT systems should be considered within the context of the BOEMRE reorganization. Specifically, BOEMRE should examine whether TIMS can be upgraded to meet business requirements and address user performance concerns by leveraging more current, web-based, user-friendly technologies together with existing tools already within the Department. BOEMRE should carefully consider factors such as speed, performance requirements, and cost-effectiveness.

Note: Recommendations that would reduce or eliminate inspectors' roles in post-accident investigations are addressed in the "Post-Accident Investigations" section.

D. Inspections: Management Support

Background

Some BOEMRE inspectors expressed concern that management did not consistently provide the strong leadership and support necessary to do their jobs effectively. Inspectors also expressed a need for clearer rules of engagement, particularly with regard to pressure exerted on them by industry in the field.

Analysis/Discussion

- Most inspectors interviewed stated that industry often exerted pressure on them to minimize reporting violations during inspections. For example, personnel on a facility may make comments such as "there goes my bonus," or "my wife is sick and I'll lose my job." Inspectors also reported that if they issued INCs, operators would sometimes call BOEMRE managers and complain about inspector behavior. For example, one inspector, new to the job, reported that on his first day on a platform he issued several INCs, and the company called to complain about his "rude and unprofessional behavior" before he returned to the office.
- During interviews, inspectors expressed the need for more effective leadership in daily operations and for greater management support when faced with pressure from industry. For example, 42% of inspectors surveyed believe that headquarters management does not provide sufficient direction and support, 35% surveyed felt that regional management does not provide sufficient support, and 33% surveyed felt that district management does not provide sufficient support.
- Operators that receive INCs may appeal to the District Manager to have the INC rescinded. A number of inspectors felt they were not sufficiently supported by their management and that in some cases management would give the benefit of the doubt to industry. Inspectors do not always have the tools necessary, such as sufficient training and adequate equipment (*e.g.,* laptops), to effectively support the issuance of INCs.
- Inspectors who issue many INCs reported that they are especially subject to industry pressure, often without sufficient management support.
- A majority of the inspectors reported receiving ethics training. However, unique circumstances exist in the GOM, where many people are part of the oil and gas community and inspectors are likely to have worked in industry and to have family members in the business. For example, one inspector reported arriving at a facility to find that his brother, who worked for the operator elsewhere, had been flown to the facility to act as the compliance officer. The inspector informed the company that he could not conduct the inspection with his brother present. Another company representative worked with the inspector during that day.

Recommendations

1. Ensure that managers and inspectors have proper training, with emphasis on the importance of a strong safety culture.
2. Ensure that inspectors have appropriate technology, resources and management support for the issuance and defense of INCs.
3. Develop and implement clear rules of engagement for operations that are transparent to all entities, including both BOEMRE and industry personnel, particularly relating to industry exerting pressure on inspectors.
4. Further develop ethics rules and training that reflect the unique circumstances of working in the GOM, with opportunities for questions and discussions.
5. Ensure that BOEMRE managers support and enforce established rules of engagement and ethics rules.

IV. Enforcement: Financial Penalties and Incentives for Safety Compliance

Issue

The current level of civil penalty fines and incentives, as well as the processing time afforded, do not make them an effective deterrent to violations of OCS regulations.

Background

To enforce compliance with BOEMRE's regulatory requirements for safe operations in the OCS, BOEMRE is authorized to issue INCs and assess civil penalties. The three types of enforcement actions for INCs are: 1) warnings; 2) component shut-ins; and 3) facility shut-ins. Warnings are issued for infractions that pose no immediate danger to personnel or equipment (such as failure to properly maintain certain records), and require the operator to report to BOEMRE the plan for corrective action, or the corrective action taken, within 14 days. Component shut-ins are ordered for malfunctioning equipment that poses an immediate danger to personnel or other equipment without affecting the overall safety of the facility. Facility shut-ins are ordered when malfunctioning equipment cannot be shut in without affecting the overall safety of the facility. Both component shut-ins and facility shut-ins are effective immediately, and remain in effect until the operator reports that the violations have been corrected and BOEMRE personnel authorize the return to operation.

Civil penalties may be assessed for violations that: cause injury, death or environmental damage; pose a threat to human life or the environment; or are not corrected after notice and expiration of a specified period. Violations for certain malfunctioning safety devices are automatically referred by the inspector for a civil penalty; other violations may be referred by the inspector or reviewing supervisor. As required by statute, BOEMRE reviews the cap on civil penalty fines for proposed adjustment at least every three years, and must adjust the cap based on increases in the consumer price index. After the most recent review, which took place in 2009, civil penalty levels remained unchanged. Civil penalties are presently capped at $35,000 per violation per day.

Analysis/Discussion

- Inspectors can cite offshore oil and gas operators for over 800 types of infractions or Potential Incidents of Noncompliance (PINC). INC violations do not have fines associated with them unless they qualify for and are processed as civil penalties.
- A successful civil penalty charge occurs only after a BOEMRE district office gathers documentation, for which up to 60 days are allowed, then determines whether to move forward, for which up to another 60 days are allowed. BOEMRE allows up to another 90 days for the regional reviewing officer to consider the charges. It then gives the company notification, which results in payment or a scheduled meeting within 30 days. Following the meeting, BOEMRE reviews any additional information provided by the company then makes a final decision. Once this occurs, the company then has up to 60 days to pay or to appeal. Overall, the process may take almost one year, which may be extended should the company appeal.

- In an environment where many operators pay between $500,000 and $1 million daily to run a facility, 41% of BOEMRE employees who responded to the survey do not believe that a potential fine of no more than $35,000 per violation per day is an effective tool to deter violations.
- In 2009, out of the 2,298 INCs issued, only 87 were referred to the civil penalty process. Also in 2009, BOEMRE collected a total of $919,000 in civil penalties, an amount that is comparable to the cost of only a one-day shut-in for a larger facility.
- The civil penalty fines may not appropriately reflect the severity of the violations. One inspector noted that a company received an $800,000 fine for an infraction where the threat of serious harm had extended over multiple days. On the other hand, if a death were to occur in a single day event, it would warrant penalties of no more than $35,000 per violation, demonstrating the inequities of the current civil penalty fine matrix.
- Currently, shut-ins are often the most effective tool available to reduce violations because lost operating costs may be significantly greater than the maximum civil penalty amount. Out of the 2,298 INCs issued in the GOM in 2009, a total of 121 facility shut-ins occurred. Further analysis would be necessary to determine whether additional shut-ins may have been appropriate.
- BOEMRE employees reported that some operators regarded the issuance of an INC as an effective tool to alter behavior, given that INCs blemish a company's overall operations record. INCs also have the potential to affect insurance levels for operator activity and the public's perception of a company's operations.
- Financial penalties for noncompliance are used as an enforcement tool by FAA, OSHA, MSHA, and NRC. FAA is willing to waive penalties in some cases for self-disclosure of problems. Financial penalties are typically supplemented with requirements for liability insurance or other financial guarantees which also provide an incentive for entities to operate in a safe manner because the cost of the insurance may be related to safety practices.
- Industry employees have limited whistleblower protection for disclosing safety violations.
- Of the 2,298 INCs issued in 2009, only 50 follow-up inspections were conducted to ensure compliance. Further analysis would be necessary to determine the number of INCs evaluated in those follow-up inspections.
- Although some INCs are corrected at the time of the inspection, 48% of the INCs issued did not have a correction date identified in BOEMRE's tracking system.
- When an INC is issued, a copy is returned to BOEMRE once the violation is corrected. For a facility or component shut-in, the operator must notify the issuing BOEMRE office before returning to operation. Some operators send in additional information, although there is no requirement to do so. To return a component or facility to service, the operator must contact the Supervisory Inspector or the District Manager. If neither is available, any of the engineering staff can act on behalf of the District Manager to grant approval. During interviews of BOEMRE personnel, one inspector noted that some operators will call BOEMRE offices multiple times until they reach someone at the agency who is willing to grant the operator permission to bring the component online.

Recommendations

1. Reevaluate the full range of enforcement actions, including INCs, civil penalties, and lease suspensions and cancellations to determine whether the enforcement actions deter violations. For example, BOEMRE should consider sanctions for repeat offenders, including those who repeatedly engage in violations that do not trigger civil penalties under the current standards.
2. Consider evaluating INCs to determine which, if any, may be appropriate for an automatic assessment of a fine and how much the fine should be. BOEMRE's evaluation could be informed by a review of the penalty structure of other regulatory agencies.
3. Review the civil penalty process to determine whether a civil penalty case can be completed effectively in less than the nearly one-year time period now afforded to assess a civil penalty.
4. Evaluate the rates and the structure of the civil penalty program and, if necessary, initiate the legislative or rulemaking process to ensure that penalties are appropriately tied to the severity of the violation.
5. Evaluate the use of facility shut-in authority to ensure its appropriate and effective utilization.
6. Develop a transparent process and public notification policy for workplace safety incidents, offshore oil spill incidents, corrective actions, and proceedings related to INCs.
7. Require on-site follow-up inspections, or other forms of evidence, to document that operators have made the required corrections to INCs.
8. Improve the INC documenting and tracking system so the status and resolution of INCs are fully documented, properly tracked and corrected.
9. Consider updating the INC form and other operational reporting documents to require operators to certify under penalty of perjury that all information submitted to the agency is accurate.
10. Consider reevaluating and making appropriate recommendations regarding: financial guarantees required from operators in case of catastrophic spills; linking the required level of financial guarantee to risk, past safety performance, and potential natural resource and economic damages.
11. Consider developing a voluntary self-disclosure policy as an incentive for companies that notify BOEMRE of safety concerns.
12. Consider working with Congress to establish whistleblower protections specifically for individuals employed in private sector oil and gas companies who disclose safety and environmental violations.
13. Consider changing the approval process for returning a facility or component to operation by limiting who has approval authority; creating a system for tracking approvals and disapprovals; and ensuring that all staff who have approval authority have access to and properly use the tracking system.

V. Environment: Environmental and Cultural Resources Protection

Issue

An apparent emphasis on lease sales and permitting may create an imbalance in how BOEMRE fulfills its dual mandate to responsibly develop OCS resources while protecting the environment and cultural resources.

Background

OCSLA provides that "the outer Continental Shelf is a vital natural resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs."[11] BOEMRE environmental and socio-cultural specialists review and assess environmental impacts of oil and gas drilling and develop recommendations to keep resources safe and mitigate damages. Operators submit plans to the Office of Field Operations (OFO). After determining that the documents on the checklist are present, the plan coordinator will submit the plans to the appropriate BOEMRE section or office.

Analysis/Discussion

- Some environmental staff reported that OFO and leasing coordinators and managers have described the analysis and recommendations prepared by the environmental staff as too burdensome for industry to implement, thus causing unnecessary delays for operators. Some environmental staff also reported that environmental assessments for smaller operators may be minimized if the OFO manager determines that implementing the recommendation may be too costly.
- Some environmental staff members noted that several BOEMRE managers have changed or minimized the scientists' potential environmental impact findings in National Environmental Policy Act (NEPA) documents to expedite plan approvals. Several individuals stated that their managers believed the result of NEPA evaluations should always be a "green light" to proceed.
- Employee performance plans and monetary awards are reported, in some cases, to be based on meeting deadlines for leasing or development approvals—financial incentives that could distort balanced decision-making.

[11] Outer Continental Shelf Lands Act, 43 U.S.C. § 1331(3).

Recommendations

1. In future institutional structures implemented through the ongoing BOEMRE reorganization, separate the management of environmental functions from those of leasing and development to ensure that environmental concerns are given appropriate weight and consideration.
2. Consider creating a review panel within BOEMRE to resolve issues that arise during environmental and socio-cultural reviews.
3. Explore and encourage other processes, policies and incentives that promote a culture of balanced stewardship and evaluate existing policies and practices that may impede the ability to achieve this balance.

VI. Post-Accident Investigations

Issue

BOEMRE's accident investigation program lacks adequate protocol for basic investigation techniques; sufficient full-time accident investigation personnel; a well defined management chain staffed with experienced leadership at the highest levels; and an effective system for ensuring that safety and other recommendations resulting from accident investigations are implemented. In addition, accident reports submitted by operators often lack sufficient detail to allow meaningful analysis by investigators.

Background

Under the current BOEMRE manual governing accident investigations, BOEMRE conducts two types of investigations: (a) "District" investigations conducted by a team appointed by the District Manager; and (b) "Panel" investigations conducted by a team appointed by the Regional Director. According to the manual, panel investigations are usually conducted when a "more in-depth investigation is needed and may involve more comprehensive investigation techniques such as formal hearings."[12] Supplemental guidelines were issued in 2009, and an Accident Investigation Handbook was issued in March 2010. While the Handbook provides more detailed guidance, it does not significantly change the basic protocol or management responsibilities outlined in the existing manual.

Investigation responsibilities for all managers and appointed investigators under BOEMRE's accident investigation program are typically collateral duties. In the GOM regional office, there are two full time accident investigators whose primary responsibilities are panel investigations. Accidents are reported to a district office, which makes the initial decision on whether to refer operator reported incidents to the regional office. The primary responsibility for initiating and managing those investigations (*i.e.*, panel investigations) lies with the Regional Director, whose authority includes determining which accidents are investigated and how the investigation will be conducted. Absent from this decision making process is any required input, guidance, or direction from headquarters on what accidents should receive a higher level review.

BOEMRE's accident investigation manual does not provide special procedures for conducting catastrophic or serious accident investigations, and does not contain adequate protocol for conducting basic investigative and evidence gathering activities.

BOEMRE regulations require self-reporting by operators of certain enumerated incidents to BOEMRE District Managers, such as fatalities, certain injuries, fires and explosions, gas releases, and losses of well control. Investigations may be initiated by evaluating the significance of accident details, usually based on the information reported by operators. Investigation reports are made publicly available and contain recommendations that could address changes to BOEMRE policies, procedures, or regulations, and can also result in the issuance of industry safety alerts. Safety alerts notify industry operators of accident causes and recommend preventive measures.

[12] BOEMRE Service Manual, Part 640, Chapter 3.

For comparison, we examined the post-accident investigation protocol of the NRC, FAA, OSHA, MSHA, and the NTSB, which revealed that, like BOEMRE, these agencies have authority to mount post-accident investigations under their jurisdiction. However, these agencies also have specific guidelines for investigative protocol and evidence gathering activities. The extent to which these investigations are conducted by independent entities varies. The NTSB is an example of a free-standing organization with the sole mission of independently investigating accidents.

Analysis and Discussion

- According to the manual governing BOEMRE's accident investigation program, accident investigations are typically conducted as a collateral duty by managers and appointed investigators and are managed at the district and regional levels. As a result, inspectors sometimes lack the necessary experience, training, and time to perform adequate investigations. For the most serious accidents, Regional Directors have broad discretion in determining which accidents warrant investigations and how those investigations will be conducted.
- Because BOEMRE's investigation manual does not contain adequate standardized protocol for conducting basic investigative and evidence gathering activities, the conduct of investigations lacks consistency and may be inadequate for investigating serious or catastrophic accidents.
- According to BOEMRE's reorganization plan, accountability for accident investigations at the headquarters level is contemplated under a new Investigations Review Unit.
- Operator incident reporting is sometimes insufficient to determine if an accident investigation is necessary. For example, operators are not required to provide site photographs and descriptions of the probable cause of the accident.
- BOEMRE lacks an independence policy for accident investigators to ensure there are no conflicts of interest with industry.
- BOEMRE lacks an independent peer review option for panel investigations. For example, the NTSB, which investigates aviation accidents and involving other transportation modes, utilized the Sandia National Laboratories to Peer Review NTSB's analysis of the I-35 Bridge Collapse (SAND2008-6206).
- BOEMRE has no system of accountability to verify if internal recommendations or safety alerts have been implemented or to track the progress of implementation. BOEMRE internal recommendations are not always implemented.

Recommendations

1. Consider restructuring the accident investigation program to dedicate additional full-time staff with appropriate training in accident investigations. Establish a supervisory chain, with investigative expertise, that includes responsibility and accountability in BOEMRE headquarters for the overall management of the accident investigations program.
2. Require operators to provide detailed descriptions of certain types of accidents (*e.g.*, gas releases), to determine whether accident investigations or other corrective actions are necessary.
3. Develop and implement internal procedures to fully conduct and document accident investigations, including basic investigation and evidence gathering protocol.
4. To supplement existing ethics requirements and recusal policy, create an independence policy for all accident investigation personnel that includes certifications signed by investigation personnel, prior to commencing work on a particular investigation, affirming the absence of any conflicts of interest.
5. Explore the utility of an independent peer review process for panel investigations.
6. Establish a system to track investigation recommendations and verify that they have been considered and implemented, as appropriate, and documented accordingly.

VII. Environmental Stewardship: Regulatory Framework, OSRP Review, OSRP Content

Issue

BOEMRE must serve a pivotal role in fostering a new culture of safety and environmental stewardship where the importance of protecting human life and the environment is woven into the process for developing and implementing its regulations. One challenge facing BOEMRE is that promulgating regulations may lag behind the development of new and emerging offshore technologies. In addition, BOEMRE's review of Oil Spill Response Plans (OSRP) does not ensure that critical data are correct or that other relevant agencies are involved in the review process. Also, OSRPs do not adequately address the calculation for worst-case discharge scenarios and fail to include measures for containing and controlling hydrocarbon discharges.

A. Environmental Stewardship: Regulatory Framework

Background

Proposals for new regulations or modifications to current regulations for emerging technologies are generally driven by regional or district personnel based on activities observed in the field and by research conducted by BOEMRE's Technology Assessment & Research (TA&R) program. The TA&R program was established to ensure that industry operations on the OCS incorporate the use of Best Available and Safest Technologies (BAST). It supports research for operational safety, pollution prevention and oil spill response. Although studies conducted through the TA&R program are readily available online for review, BOEMRE does not provide a summary of actions taken as a result of the recommendations from each study. While BOEMRE has implemented the recommendations from some of the studies, there is no current mechanism for tracking outputs resulting from studies.

BOEMRE personnel raise regulatory needs to the national office, where concept papers are developed for senior management review and approval. Once the concept is approved, regulations are drafted through collaboration between BOEMRE national and regional subject matter experts. They are reviewed and approved by regional and national management before initiation of the formal rulemaking publication process.

Analysis and Discussion

- Regulations that specifically address deepwater activities exist, but are scattered throughout BOEMRE regulation subparts and are not comprehensive, resulting in gaps and inconsistencies in interpretation.
- Apart from the rulemaking process, the other means available to clarify the use of emerging technologies are NTLs, safety alerts, approvals for alternative technologies or procedures, and departures. Questions have been raised in interviews and otherwise as to the use of NTLs and safety alerts and whether new regulations would be more suitable.

- Regulations typically take years to promulgate. For example, BOEMRE has a proposed rule change to incorporate a Safety and Environmental Management System (SEMS) Regulation that has been under consideration by BOEMRE for many years. The SEMS Rule is now under active consideration for publication this year.
- Because BOEMRE permitting employees conduct reviews of industry requests for use of new technology or standards under the regulations governing "alternative procedures or equipment" and "departures" (30 CFR §§ 250.141 and 142, respectively), the protracted timeframes for promulgating regulations that address emerging technologies has significant implications for the permitting process.
- BOEMRE may not have sufficient staff with the requisite expertise to review and vet standards that have been developed by industry group subject matter experts, such as the American Petroleum Institute (API), to determine the extent to which those standards should be used in developing regulations. BOEMRE references less than 80 of the approximately 240 API standards related to exploration and development in its current regulations.
- It is unclear the extent to which recommendations from TA&R studies result in new or updated regulations because BOEMRE does not have an established mechanism to track implementation of these recommendations.
- BOEMRE and API have conducted limited research to review the effects of deep water on equipment and operations. With the exception of requirements for drilling and platform design in varying depths, BOEMRE regulations do not distinguish between operations in deep water and shallow water. Studies related to the effect of water depth on equipment and operations provide conflicting viewpoints that are inconclusive.

Recommendations

1. Develop a dynamic regulatory framework that promotes efficiency in the development and promulgation of regulations; provides for interim and continuing guidance to operators; provides clear guidance and ensures the appropriate use of NTLs and safety alerts; addresses gaps, inconsistencies, comprehensiveness and organization within BOEMRE regulations; and facilitates working with other agencies to reconcile related regulations.
2. Ensure that BOEMRE has sufficient staff with the expertise needed to review and vet standards developed by industry group subject matter experts to determine the extent to which those standards should be used in developing regulations.
3. Identify actionable items from the TA&R studies, track concurrence and implementation of those items, document rejected recommendations, and consider broader opportunities for the TA&R program.
4. Consulting with technical experts, conduct further analysis of the effects of water depth on equipment and operations, and determine the adequacy of current regulations.

B. Environmental Stewardship: OSRP Review

Background

After initial submission and approval, OSRPs are reviewed every two years. OSRPs are lengthy documents, many exceeding 500 pages. Many details within the OSRPs may not be reviewed to verify that important information is correct. For example, BOEMRE's review process was described by some oil spill coordinators as being designed to check for the inclusion of required sections rather than to verify the accuracy of information in those sections. Further, it appears that BOEMRE does not regularly verify the calculation for worst-case discharge scenarios. This calculation is a driver for the response requirements for the plan. BOEMRE reviews approximately 170 federal OSRPs in the GOM Region and 11 OSRPs in the Pacific Region (consisting of six federal plans and five state plans under an MOU with the State of California).

Analysis/Discussion

- GOM Regional oil spill coordinators conduct minimal reviews and analyses of OSRPs, leaving worst-case discharge calculations and contact information unverified, among other things.
- GOM reviewing officials may not have the qualifications necessary to conduct a proper review of OSRPs.
- BOEMRE is responsible for reviewing OSRPs, while the USCG is responsible for the execution of the plans. USCG officials often do not review OSRPs and are not notified when new OSRPs come in for review. EPA is not involved in the OSRP review process.
- There is a current Memorandum of Agreement between BOEMRE and the USCG that establishes jurisdiction and clarifies responsibilities between BOEMRE and USCG regarding oil discharge planning, preparedness, and response.
- OSRPs require that facilities be classified with a worst-case discharge volume rating. Worst-case discharges, however, are often not classified and rated as required.
- Inspectors do not verify the availability and presence of third-party equipment listed in the OSRP prior to conducting equipment inspections.

Recommendations

1. Draft a new Memorandum of Agreement with the USCG, EPA, and other interested agencies, requiring appropriate participation of all parties in the review of OSRPs, and any related drills or exercises.
2. Develop a review process for OSRPs that incorporates risk-based and other strategies to ensure that all critical information and spill scenarios are included in the OSRP by operators, and are comprehensively reviewed and verified by BOEMRE and/or other appropriate officials.
3. Determine and ensure technical expertise necessary for staff to conduct comprehensive reviews of OSRPs.
4. Ensure that inspectors verify the availability and presence of all equipment, including third-party equipment, listed in OSRPs prior to conducting inspections.

C. Environmental Stewardship: OSRP Content

Background

According to BOEMRE staff assigned to the Oil Spill program, containing and controlling the source of the spill is not the emphasis of the OSRP. In their view, plans are instead based largely on recovering oil from the spill. Thus, recovering oil from a worst-case discharge scenario is a major driver for the plan's response requirements. Currently, the regulatory formula for calculation of the worst-case discharge scenario anticipates a spill flow of no more than 30 days. According to BOEMRE staff, given the duration of flow from the *Deepwater Horizon* accident, the worst-case discharge calculation is currently being reconsidered.

Analysis and Discussion

- As directed in 30 CFR § 254.47, a worst-case discharge is calculated for a period of only 30 days.
- OSRPs are designed to deal with surface oil cleanup, not containment and control of wells at the spill's source.
- There may be other areas within BOEMRE's oil development process, such as exploratory permitting, that provide more detail on the containment and control of spills.

Recommendations

1. Develop policies and procedures to require detailed descriptions of containment and control measures for the source of possible spills and determine where to incorporate these measures, either in the OSRP or elsewhere in the permitting process.
2. Review calculations for worst-case discharges, with input from the United States Geological Survey, and make recommendations for changes to 30 CFR § 254.47 as appropriate.
3. Conduct additional research on containment and control measures to determine appropriate requirements for containing oil discharge at the source.

APPENDIX: SUMMARY OF RECOMMENDATIONS

Permitting: Resources and Protocol for Permit Review

Issue: Gulf of Mexico (GOM) district offices are challenged by the volume and complexity of permit applications and the lack of a standardized engineering review protocol. In addition, the Pacific Region's permitting staff is facing significant succession issues.

Recommendations

1. Review permit staffing needs in the GOM district and regional offices to ensure that staffing levels are commensurate with increasing workloads.
2. Develop a succession plan for BOEMRE staff in all regions.
3. Develop a comprehensive and current handbook to compile and standardize policies and practices designed to assist permit reviewers in carrying out their responsibilities.
4. Review and revise the permit review protocols to ensure that: (a) permit requests from operators and district responses are documented promptly and properly; (b) BOEMRE engineers have appropriate access to permit databases after hours; and (c) procedures are established that prevent "engineer shopping" by operators.
5. Reexamine after-hours permit review services; the means by which any such services should be provided (*e.g.*, on-call or in-office staffing); and the feasibility of limiting its use by requiring operators to submit non-emergency requests and requests that could be reasonably anticipated during normal business hours.

Inspections: Program Structure, Training, Personnel and Resources, Management Support

Issue: Inspectors are an important line of defense for promoting safety and environmental protection in offshore oil and gas development. Currently, however, certain challenges affect the overall effectiveness of the inspection program. Specifically, inspectors (a) are part of a program structure that is ineffective in facilitating the elevation of issues or concerns up the management chain; (b) begin and continue their jobs with no standardized training, testing, or certification; (c) operate with minimal resources; and (d) sometimes operate without strong management support.

A. Inspections: Program Structure and Effectiveness

Recommendations

1. Develop an inspection program with strong representation at all levels of the agency. The program should facilitate good intra-agency communication in order to promote consistency, effectiveness, and efficiency and provide strong support to the front-line inspectors.

2. Compile a comprehensive and current handbook of all policies and practices designed to assist inspectors in carrying out their responsibilities.
3. Clarify the criteria for what constitutes unannounced inspections. Review and clarify the current policies under which unannounced inspections can be performed, including the USCG MARSEC restrictions, and special notification arrangements with certain companies, so that unannounced inspections can be conducted to the greatest extent practicable.
4. Identify critical operations conducted on all BOEMRE regulated facilities, and require that operators notify the agency about the timing of these operations so that inspectors can view operations first hand to the greatest extent practicable.
5. Evaluate the advantages of conducting inspections in two-person teams instead of individually.
6. Analyze the benefits of obtaining electronic access to real-time data transmitted from offshore platforms/drilling rigs, such as operators' surveillance cameras, blow-out preventer monitoring systems, and/or other automated control and monitoring systems, to provide BOEMRE with additional oversight tools.
7. Examine the viability of performing multi-day inspections of critical operations on rigs and platforms.
8. Evaluate the advantages of rotating inspectors among districts and regions.

B. Inspections: Training and Professional Development

Recommendations

1. Implement a bureau-wide certification or accreditation program for inspectors. Consider partnering with BLM and its National Training Center to establish a DOI oil and gas inspection certification program, with training modules appropriate to the offshore environment as needed.
2. Develop a standardized training program similar to other Interior bureaus to ensure that inspectors are knowledgeable in all pertinent regulations, policies, and procedures. Ensure that annual training keeps inspectors up-to-date on new technology, policies, and procedures.
3. Develop Individual Development Plans for inspectors designed to achieve career advancement strategies. Such strategies should promote sound succession planning and foster employee development and satisfaction.
4. Expand, to the greatest extent practicable, the sources from which BOEMRE draws inspector applicants, and identify incentives to recruit and retain inspectors. Reevaluate whether inspectors can participate in the Student Loan Repayment Program and are eligible for hazard pay.
5. Consider developing more subject matter experts in each of the various types of inspections within district offices.

C. Inspections: Personnel and Resources

Recommendations

1. BOEMRE should undertake a comprehensive workforce and workload analysis of the inspection program, including succession planning, anticipated workload needs, and increased capacity, and implement appropriate recommendations.
2. Analyze ways to perform inspection activities more efficiently by using current technological tools, such as online review of reports and records and by using mobile technology in the field.
3. IT systems should be considered within the context of the BOEMRE reorganization. Specifically, BOEMRE should examine whether TIMS can be upgraded to meet business requirements and address user performance concerns by leveraging more current, web-based, user-friendly technologies together with existing tools already within the Department. BOEMRE should carefully consider factors such as speed, performance requirements, and cost-effectiveness.

D. Inspections: Management Support

Recommendations

1. Ensure that managers and inspectors have proper training, with emphasis on the importance of a strong safety culture.
2. Ensure that inspectors have appropriate technology, resources and management support for the issuance and defense of INCs.
3. Develop and implement clear rules of engagement for operations that are transparent to all entities, including both BOEMRE and industry personnel, particularly relating to industry exerting pressure on inspectors.
4. Further develop ethics rules and training that reflect the unique circumstances of working in the GOM, with opportunities for questions and discussions.
5. Ensure that BOEMRE managers support and enforce established rules of engagement and ethics rules.

Enforcement: Financial Penalties and Incentives for Safety Compliance

Issue: The current level of civil penalty fines and incentives, as well as the processing time afforded, do not make them an effective deterrent to violations of OCS regulations.

Recommendations

1. Reevaluate the full range of enforcement actions, including INCs, civil penalties, and lease suspensions and cancellations to determine whether the enforcement actions deter violations. For example, BOEMRE should consider sanctions for repeat offenders, including those who repeatedly engage in violations that do not trigger civil penalties under the current standards.
2. Consider evaluating INCs to determine which, if any, may be appropriate for an automatic assessment of a fine and how much the fine should be. BOEMRE's evaluation could be informed by a review of the penalty structure of other regulatory agencies.
3. Review the civil penalty process to determine whether a civil penalty case can be completed effectively in less than the nearly one-year time period now afforded to assess a civil penalty.
4. Evaluate the rates and the structure of the civil penalty program and, if necessary, initiate the legislative or rulemaking process to ensure that penalties are appropriately tied to the severity of the violation.
5. Evaluate the use of facility shut-in authority to ensure its appropriate and effective utilization.
6. Develop a transparent process and public notification policy for workplace safety incidents, offshore oil spill incidents, corrective actions, and proceedings related to INCs.
7. Require on-site follow-up inspections, or other forms of evidence, to document that operators have made the required corrections to INCs.
8. Improve the INC documenting and tracking system so the status and resolution of INCs are fully documented, properly tracked and corrected.
9. Consider updating the INC form and other operational reporting documents to require operators to certify under penalty of perjury that all information submitted to the agency is accurate.
10. Consider reevaluating and making appropriate recommendations regarding: financial guarantees required from operators in case of catastrophic spills; linking the required level of financial guarantee to risk, past safety performance, and potential natural resource and economic damages.
11. Consider developing a voluntary self-disclosure policy as an incentive for companies that notify BOEMRE of safety concerns.
12. Consider working with Congress to establish whistleblower protections specifically for individuals employed in private sector oil and gas companies who disclose safety and environmental violations.

13. Consider changing the approval process for returning a facility or component to operation by limiting who has approval authority; creating a system for tracking approvals and disapprovals; and ensuring that all staff who have approval authority have access to and properly use the tracking system.

Environment: Environmental and Cultural Resources Protection

Issue: An apparent emphasis on lease sales and permitting may create an imbalance in how BOEMRE fulfills its dual mandate to responsibly develop OCS resources while protecting the environment and cultural resources.

Recommendations

1. In future institutional structures implemented through the ongoing BOEMRE reorganization, separate the management of environmental functions from those of leasing and development to ensure that environmental concerns are given appropriate weight and consideration.
2. Consider creating a review panel within BOEMRE to resolve issues that arise during environmental and socio-cultural reviews.
3. Explore and encourage other processes, policies and incentives that promote a culture of balanced stewardship and evaluate existing policies and practices that may impede the ability to achieve this balance.

Post-Accident Investigations

Issue: BOEMRE's accident investigation program lacks adequate protocol for basic investigation techniques; sufficient full-time accident investigation personnel; a well defined management chain staffed with experienced leadership at the highest levels; and an effective system for ensuring that safety and other recommendations resulting from accident investigations are implemented. In addition, accident reports submitted by operators often lack sufficient detail to allow meaningful analysis by investigators.

Recommendations

1. Consider restructuring the accident investigation program to dedicate additional full-time staff with appropriate training in accident investigations. Establish a supervisory chain, with investigative expertise, that includes responsibility and accountability in BOEMRE headquarters for the overall management of the accident investigations program.
2. Require operators to provide detailed descriptions of certain types of accidents (*e.g.*, gas releases), to determine whether accident investigations or other corrective actions are necessary.
3. Develop and implement internal procedures to fully conduct and document accident investigations, including basic investigation and evidence gathering protocol.

4. To supplement existing ethics requirements and recusal policy, create an independence policy for all accident investigation personnel that includes certifications signed by investigation personnel, prior to commencing work on a particular investigation, affirming the absence of any conflicts of interest.
5. Explore the utility of an independent peer review process for panel investigations.
6. Establish a system to track investigation recommendations and verify that they have been considered and implemented, as appropriate, and documented accordingly.

Environmental Stewardship: Regulatory Framework, OSRP Review, OSRP Content

Issue: BOEMRE must serve a pivotal role in fostering a new culture of safety and environmental stewardship where the importance of protecting human life and the environment is woven into the process for developing and implementing its regulations. One challenge facing BOEMRE is that promulgating regulations may lag behind the development of new and emerging offshore technologies. In addition, BOEMRE's review of Oil Spill Response Plans (OSRP) does not ensure that critical data are correct or that other relevant agencies are involved in the review process. Also, OSRPs do not adequately address the calculation for worst-case discharge scenarios and fail to include measures for containing and controlling hydrocarbon discharges.

A. Environmental Stewardship: Regulatory Framework

Recommendations

1. Develop a dynamic regulatory framework that promotes efficiency in the development and promulgation of regulations; provides for interim and continuing guidance to operators; provides clear guidance and ensures the appropriate use of NTLs and safety alerts; addresses gaps, inconsistencies, comprehensiveness and organization within BOEMRE regulations; and facilitates working with other agencies to reconcile related regulations.
2. Ensure that BOEMRE has sufficient staff with the expertise needed to review and vet standards developed by industry group subject matter experts to determine the extent to which those standards should be used in developing regulations.
3. Identify actionable items from the TA&R studies, track concurrence and implementation of those items, document rejected recommendations, and consider broader opportunities for the TA&R program.
4. Consulting with technical experts, conduct further analysis of the effects of water depth on equipment and operations, and determine the adequacy of current regulations.

B. Environmental Stewardship: OSRP Review

Recommendations

1. Draft a new Memorandum of Agreement with the USCG, EPA, and other interested agencies, requiring appropriate participation of all parties in the review of OSRPs, and any related drills or exercises.
2. Develop a review process for OSRPs that incorporates risk-based and other strategies to ensure that all critical information and spill scenarios are included in the OSRP by operators, and are comprehensively reviewed and verified by BOEMRE and/or other appropriate officials.
3. Determine and ensure technical expertise necessary for staff to conduct comprehensive reviews of OSRPs.
4. Ensure that inspectors verify the availability and presence of all equipment, including third-party equipment, listed in OSRPs prior to conducting inspections.

C. Environmental Stewardship: OSRP Content

Recommendations

1. Develop policies and procedures to require detailed descriptions of containment and control measures for the source of possible spills and determine where to incorporate these measures, either in the OSRP or elsewhere in the permitting process.
2. Review calculations for worst-case discharges, with input from the United States Geological Survey, and make recommendations for changes to 30 CFR § 254.47 as appropriate.
3. Conduct additional research on containment and control measures to determine appropriate requirements for containing oil discharge at the source.

ACRONYMS

APM	APPLICATION FOR PERMIT TO MODIFY
ASLM	ASSISTANT SECRETARY, LAND AND MINERALS MANAGEMENT
ASPMB	ASSISTANT SECRETARY, POLICY, MANAGEMENT AND BUDGET
BAST	BEST AVAILABLE AND SAFEST TECHNOLOGIES
BLM	BUREAU OF LAND MANAGEMENT
BOEMRE	BUREAU OF OCEAN ENERGY MANAGEMENT, REGULATION AND ENFORCEMENT
FAA	FEDERAL AVIATION ADMINISTRATION
GOM	GULF OF MEXICO
INC	INCIDENT OF NONCOMPLIANCE
MARSEC	MARITIME SECURITY PLAN
MMS	MINERALS MANAGEMENT SERVICE
MSHA	MINE SAFETY AND HEALTH ADMINISTRATION
NEPA	NATIONAL ENVIRONMENTAL POLICY ACT
NRC	NUCLEAR REGULATORY COMMISSION
NTL	NOTICE TO LESSEES
NTSB	NATIONAL TRANSPORTATION SAFETY BOARD
OCS	OUTER CONTINENTAL SHELF
OCSLA	OUTER CONTINENTAL SHELF LANDS ACT
OFO	OFFICE OF FIELD OPERATIONS
OIG	OFFICE OF THE INSPECTOR GENERAL
OPM	OFFICE OF PERSONNEL MANAGEMENT
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OSRP	OIL SPILL RESPONSE PLAN

PINC	POTENTIAL INCIDENT OF NONCOMPLIANCE
PPA	OFFICE OF POLICY ANALYSIS
TA&R	TECHNOLOGY ASSESSMENT AND RESEARCH
TIMS	TECHNICAL INFORMATION MANAGEMENT SYSTEM
USCG	UNITED STATES COAST GUARD

United States Department of the Interior

BUREAU OF OCEAN ENERGY
MANAGEMENT, REGULATION AND ENFORCEMENT

Washington, DC 20240

Honorable Ken Salazar
Secretary of the Interior

September 4, 2010

Dear Mr. Secretary:

Attached is the Implementation Plan of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) in response to the Report of the Outer Continental Shelf Safety Oversight Board. We very much appreciate your providing us with the opportunity to review the Report in draft, provide comments and submit this Implementation Plan.

As the Report makes clear, the Board's recommendations are the product of substantial effort, including a large investment of DOI manpower over the course of many months. The Report acknowledges that many of its insights and recommendations directly flow from information and insights provided by BOEMRE personnel. As the Report states,

> Overall, the [team] found the BOEMRE employees it interviewed to be dedicated, enthusiastic cadre of professionals who want nothing more than to do their jobs effectively and efficiently and to see their Bureau reorganize into a robust, high-performing and respected organization. However, BOEMRE employees also provided ample information about the weaknesses of the program and operations, and how they might be addressed. This report contains many of their observations, and the Board's recommendations that emanated from those observations.

Report at 4.

This is presented as a paradox, but of course it is not. Like you, I expect dedicated professionals to be candid and insightful about the weaknesses of their organization and their programs, and full of ideas on how to improve. That is what the Board found, and that is what we are counting on to transform the organization in the months ahead.

The theme of the Implementation Plan we are submitting is that the bulk of the Board's recommendations are being addressed – either directly or indirectly – by the ongoing reorganization that has already begun. This is not meant to suggest that the Board's observations and recommendations are irrelevant; quite the opposite is true. They are so centrally relevant that the very BOEMRE personnel who were the source of

so many of the Board's observations and recommendations are the same players who are playing key roles in our reorganization and who have the mandate to improve what we do and how we do it.

I began as Director of BOEMRE on June 21. Since that time, we have done the following:

- Moved our reorganization efforts into high gear with the retention of McKinsey & Company and an ambitious schedule for meeting with BOEMRE personnel and seeking their assistance in making sure the reorganization succeeds;
- Conducted all-hands meetings in New Orleans, Herndon, Camarillo, Anchorage, and Washington, DC, to keep our personnel up to date on the reorganization and answer any and all questions, including questions submitted anonymously, on any subject;
- Taken the steps necessary to ensure the separation of the royalty and revenue function and the creation of the Office of Natural Resource Revenue (ONRR) as of October 1;
- Created the Investigations and Review Unit (IRU), which is taking the lead on the Vermilion fire investigation, and staffed it with personnel from the private sector and the Department of Justice;
- Held five of eight forums around the country to gather information relevant to your decision on the deepwater drilling moratorium, focusing on drilling and workplace safety, spill containment, and spill response;
- Requested the preparation of reports by BP on lessons learned from the Deepwater Horizon explosion and spill;
- Persuaded the American Petroleum Institute (API) to make those of its standards incorporated by reference in BOEMRE regulations truly public for the first time;
- Issued tough new conflict of interest/recusal rules for offshore drilling inspectors and related personnel.

In the very near future, we will be issuing an interim final rule that requires additional drilling safety measures and issuing a SEMS rule that will for the first time require industry to establish comprehensive safety and environmental management systems. To put it mildly, we have been busy.

We appreciate your support as well as the support of the rest of the Administration and Congress in our efforts to obtain the main ingredient that has been missing over the three decades of the agency's existence: adequate resources to do the job. For the first time, those resources appear to be on the way. They will provide grounds for optimism that the agency will, finally, have what it needs to perform the important tasks assigned to it.

We know that there is no magic wand that will make the shadow of the past disappear or that will magically usher in a new era for this agency. As long as the multiple investigations related to *Deepwater Horizon* continue – by the joint BOEMRE/USCG investigation into *Deepwater Horizon*, the President's Commission, the

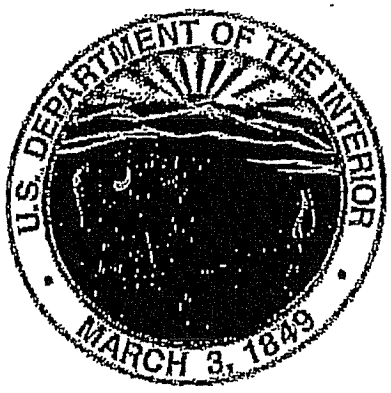
National Academy of Engineering, the OIG, the GAO, and multiple Congressional committees – the shadow of the past will continue to be with us. As we note in the Conclusion of the Implementation Plan, this creates a risk that because the results of these reviews will continue to flow in over time, and they are based largely on the state of affairs within MMS as of April 20, 2010, the world's view of BOEMRE will continue to be frozen in the past and will not keep up with the reform efforts that are currently in full-swing.

That is misguided and unfair, especially to the extent that the agency continues to be stigmatized by the outrageous and unforgivable behavior of a few employees many years ago. It is critically important that as our reform efforts continue, the Department and the outside world acknowledge those efforts and recognize the enormous transformation the agency is undergoing.

Thank you again for providing us with the opportunity to review and respond to the Report.

Very truly yours,

Michael R. Bromwich



IMPLEMENTATION PLAN

In Response To The

OUTER CONTINENTAL SHELF SAFETY OVERSIGHT BOARD'S SEPTEMBER 1, 2010 REPORT TO THE SECRETARY OF THE INTERIOR

September 4, 2010

Michael R. Bromwich, Director
Bureau of Ocean Energy Management, Regulation and Enforcement

I. Introduction

On April 20, 2010, the *Deepwater Horizon* offshore drilling rig caught fire and exploded, killing eleven people, destroying the rig, and leading to an oil spill of enormous and continuing national significance. Among the actions taken by the Secretary of the Interior immediately following the *Deepwater Horizon* incident, he created the Outer Continental Shelf Safety Oversight Board (Safety Oversight Board or Board). As stated in the Safety Oversight Board's September 1, 2010 report to the Secretary (the Report), it was charged with "providing recommendations to improve and strengthen the Department's overall management, regulation, and oversight of [outer continental shelf] operations." This Implementation Report responds to the 59 recommendations by the Safety Oversight Board that are contained in the Report.

The Report is a thorough and comprehensive document, based in considerable part on the information and insights provided by personnel from within the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE or the Bureau). That bears saying and repeating: although the Bureau has received far more than its share of condemnation and blame for the outrageous and intolerable sins of a small number of people, the majority of Bureau personnel are dedicated and talented professionals, many of whom know full well what needs to be done to improve the Bureau's performance in managing, regulating, and overseeing outer continental shelf (OCS) resources. They have not lacked the knowledge or the insight; they have lacked resources, a robust and coherent structure, and focused leadership. We believe all of that is changing, because it must.

We concur with the Safety Oversight Board's recommendations. This document is not a response in the usual sense; although we have minor differences with some of the observations contained in the Report, we do not address them here. We have chosen instead to describe how, without knowing in advance what the recommendations would be, we have already been moving to implement the bulk of them as part of our overall reform efforts.

The Board's recommendations are wholly consistent with the reform agenda that Secretary Salazar launched for the former MMS, including his May 19, 2010 Order directing the reorganization of MMS and his work in support of securing substantial additional funds for the Bureau, which are critical to ensuring the successful transformation of the agency. Director Bromwich has built upon and further developed this reform agenda for the Bureau since his arrival in late June 2010. The President's and Secretary's charge to Director Bromwich was explicit – reform the way the agency does business in managing and regulating offshore energy development on the nation's OCS. The Board's observations and recommendations are therefore both relevant and timely as we proceed with the reorganization of the Bureau and the implementation of other wide-ranging reforms in the way the Bureau manages and regulates activity on the OCS.

II. Overview: Implementation of the Board's Recommendations

Many of the Board's recommendations will be addressed through initiatives and programs that are already in process and are central to the reform agenda of BOEMRE. These initiatives and programs, through which the Report's recommendations and other reforms will be implemented, include:

Reorganization. On May 19, 2010, the Secretary issued Secretarial Order No. 3299, which assigned the responsibilities and functions of the former Minerals Management Service (MMS) to three new organizations – the Office of Natural Resources Revenue (ONRR), the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE). Broadly speaking, the purpose of the reorganization is to address real and perceived conflicts between the resource management, safety and environmental oversight and enforcement, and revenue collection responsibilities of the former MMS and to help restore credibility in the performance of all of these functions. On July 14, 2010, the Department issued a report setting forth the plan for implementing the reorganization (the Reorganization Implementation Report).

If the reorganization of the former MMS is to effect genuine improvements in the way in which the Department manages offshore energy resources and ensure that offshore energy development is conducted in a manner that ensures the safety of workers and adequately protects the environment, it must involve a great deal more than merely separating functions into the new organizations.. Multiplying organizations does not by itself solve problems. Among other things, the implementation of the reorganization will involve:

- building new systems for processing and analyzing data and performing risk assessments in permitting and environmental reviews;
- designing and implementing a robust, effective, and aggressive safety and environmental enforcement regime based on rigorous analysis of best practices and the challenges presented by industry;
- creating new policies and guidance for both federal personnel and industry;
- developing training programs and curricula;
- recruitment of scores of new professionals;
- establishing efficient, modern information systems; and
- developing management structures and systems appropriate to the scale and missions of the new organizations.

As discussed in the Reorganization Implementation Report, the reorganization, including these central elements, are expected to be implemented through a phased program that will continue at least through 2011. Many of the recommendations contained in the Report bear on these issues related to the implementation of the reorganization and will be incorporated into that process.

Additional Resources. As the Board recognizes in the Report, the reform of the Bureau, including through the reorganization and the implementation of many of the Report's recommendations, will require the infusion of substantial resources, in form of funding, personnel, equipment, and information systems. Recommendations of the Board that will require additional resources in order to be properly implemented include, for example, the development of strengthened inspection and safety enforcement programs, creating new training and professional development programs, upgrading information systems and technological resources, and recruiting new staff and bringing additional, specialized expertise into the Bureau.

Indeed, managing the implementation of all the Board's recommendations, through the reorganization and other means, will itself require the addition and deployment of substantial resources to develop the policies, procedures, and other means necessary for the implementation of the recommendations as well as for tracking the status of the reforms and evaluating their effectiveness. The Administration, Congress, and the Department support providing the Bureau with the funding and resources necessary to implement broad reform of the offshore energy management and enforcement regimes. Those are vital to meaningful change and improvement within the Bureau.

Ethics Reform. One of the first reform measures taken by Director Bromwich was the creation, embodied in a Secretarial order, of the Investigations and Review Unit (IRU) within BOEMRE. The mission of the IRU includes, among other things, promptly and aggressively responding to allegations or evidence of misconduct or unethical behavior by BOEMRE employees or members of industry and aiding the Director in overseeing and reviewing the Bureau's regulatory and enforcement programs. The IRU, which is already functioning and is being staffed by experienced professionals, including federal prosecutors and investigative agents on detail to BOEMRE, will be central to ensuring that Bureau employees, as well as members of industry, adhere to high standards of conduct and that appropriate action is taken when those standards are not met.

The Report contains recommendations relating to the development of ethical rules and standards; such standards are key elements in establishing a culture of ethical conduct both within BOEMRE and industry. Prior to the issuance of the Report, Director Bromwich announced a new policy regarding "Interference with the Performance of Official Duties and Potential Conflicts of Interest." This new policy establishes standards and procedures relating to (1) reporting and responding to attempts by industry personnel to harass, intimidate, or improperly influence Bureau personnel with respect to the performance of their official duties, including the issuance of Incidents of

Noncompliance (INCs) based on inspection activity; (2) the reporting by Bureau employees of relationships and former employment that may give rise to a potential conflict of interest; (3) the avoidance of even the appearance of a conflict of interest or loss of impartiality; and (4) the mandatory recusal of employees under circumstances where a conflict of interest may be present, including a prohibition on employees performing official duties relating to a former employer for a period of two years. This policy focused on BOEMRE's offshore inspections program because that is where the most difficult and common issues have arisen. In the coming weeks and months, we will continue to review and enhance the ethical standards applicable to all Bureau employees, not just inspections personnel, as well as members of industry.

Inter-Agency Coordination. The Bureau currently is engaged in various actions designed to improve inter-agency coordination with respect to offshore energy development. These initiatives include the development of mechanisms to take advantage of expertise, resources, data, and information in the hands of various federal agencies – including the National Oceanic and Atmospheric Agency (NOAA), the Environmental Protection Agency (EPA) and other agencies – and which relate specifically to environmental science, environmental protection and enforcement, and the mitigation of the environmental effects of offshore energy development. The Bureau also is collaborating with the United States Coast Guard (USCG) and other relevant agencies on the issues of oil spill response and requirements relating to oil spill response plans (OSRPs).

The remainder of this Implementation Report discusses the specific recommendations offered by the Safety Oversight Board and the Bureau's plans for evaluating and implementing those recommendations within the broader context of our reform efforts, consistent with the President's and the Secretary's charge to Director Bromwich. This discussion is structured consistent with the organization of the Report.

III. Permitting: Resources and Protocol for Permit Review

This section of the Report discusses the demands and challenges confronting BOEMRE personnel involved in the offshore energy resource management process, including in particular the review of plans and permit applications. The issues identified by the Board focus on workload, staffing, and challenges facing the Bureau as a significant percentage of its employees involved in these activities are, or become in the near future, eligible for retirement.[1]

Recommendations and Implementation

This section of the Report contains the following recommendations:

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[1] Although the Report focuses on "succession issues" and the percentage of retirement-eligible employees in the Pacific Region, the need to retain experienced personnel while recruiting and training new personnel as staff turns over is a significant issue across the Bureau and all of its regions.

1. Review permit staffing needs in the Gulf of Mexico (GOM) district and regional offices to ensure that staffing levels are commensurate with increasing workloads.
2. Develop a succession plan for BOEMRE staff in all regions.
3. Develop a comprehensive and current handbook to compile and standardize policies and practices designed to assist permit reviewers in carrying out their responsibilities.
4. Review and revise the permit review protocols to ensure that: (a) permit requests from operators and district responses are documented promptly and properly; (b) BOEMRE engineers have appropriate access to permit databases after hours; and (c) procedures are established that prevent "engineer shopping" by operators.
5. Reexamine after-hours permit review services; the means by which any such services should be provided (*e.g.*, on-call or in-office staffing); and the feasibility of limiting its use by requiring operators to submit non-emergency requests and requests that could be reasonably anticipated during normal business hours.

The issues relating to the permitting process implicated by these recommendations are being actively studied and evaluated during the reorganization effort. This analysis, including the work being performed by experienced consultants retained in support of the reorganization, involves a close review of the plan and permit review and approval processes, as well as the allocation of existing – and anticipated new – personnel resources involved in these processes across the Bureau's regions, including the Gulf of Mexico. As described above, a key part of implementing the reorganization will be the development of comprehensive, standardized policies, practices and protocols, including for the plan and permit application review processes. As these new procedures and protocols are being developed, we will consider developing interim guidance and measures to address issues such as after-hours access to databases, "engineer shopping" by operators, and after-hours requests by operators.

IV. Inspections: Program Structure, Training, Management Support, Personnel and Resources

A. Inspections: Program Structure and Effectiveness

This section of the Report relates to the structure and operation of the Bureau's inspection program for offshore facilities.

Recommendations and Implementation

1. Develop an inspection program with strong representation at all levels of the agency. The program should facilitate good intra-agency communication in order to promote consistency, effectiveness, and efficiency and provide strong support to the front-line inspectors.
2. Compile a comprehensive and current handbook of all policies and practices designed to assist inspectors in carrying out their responsibilities.

3. Clarify the criteria for what constitutes unannounced inspections. Review and clarify the current policies under which unannounced inspections can be performed including, the USCG MARSEC restrictions, and special notification arrangements with certain companies, so that unannounced inspections can be conducted to the greatest extent practicable.
4. Identify critical operations conducted on all BOEMRE regulated facilities, and require that operators notify the agency about the timing of these operations so that inspectors can view operations first hand to the greatest extent practicable.
5. Evaluate the advantages of conducting inspections in two-person teams instead of individually.
6. Analyze the benefits of obtaining electronic access to real-time data transmitted from offshore platforms/drilling rigs, such as operators' surveillance cameras, blowout preventer monitoring systems, and/or other automated control and monitoring systems, to provide BOEMRE with additional oversight tools.
7. Examine the viability of performing multi-day inspections of critical operations on rigs and platforms.
8. Evaluate the advantages of rotating inspectors among districts and regions.

The Bureau's offshore inspections program is one of the most critical and pressing areas requiring the infusion of enhanced resources and capabilities. A significant proportion of the anticipated increases in the Bureau's funding and personnel resources will be devoted to the inspections program, including the hiring of scores of new inspectors and other personnel, including engineers, with expertise in drilling operations and safety. The Bureau currently is developing strategies for the recruitment of these personnel, including outreach and coordination with colleges and graduate programs relating to petroleum and systems engineering, environmental science, and other relevant areas of expertise. While the infusion of resources is essential to the establishment of a robust compliance regime that can keep pace with industry, so too is the development of new strategies and systems for conducting inspections and monitoring and evaluating the safety of operations.

The Report's recommendations will be closely considered and incorporated into the development of these new inspection and safety strategies and systems. These recommendations are particularly relevant to the establishment of the safety compliance and enforcement functions of BSEE. The Bureau has established a team that is focused on developing enhancements to the inspections program, including the measures recommended by the Board, that can be implemented in the near-term, as well as strategies and measures that will be incorporated into BSEE's programs as the reorganization progresses and new resources and personnel become available. This team is scheduled to provide a report to Director Bromwich by November 2010.

B. Inspections: Training and Professional Development

This section of the Report relating to the training and professional development of inspectors addresses another significant issue essential to improving the effectiveness of the inspections program and the ability of inspectors to keep pace with industry.

Recommendations and Implementation

1. Implement a bureau-wide certification or accreditation program for inspectors. Consider partnering with BLM and its National Training Center to establish a DOI oil and gas inspection certification program, with training modules appropriate to the offshore environment as needed.
2. Develop a standardized training program similar to other Interior bureaus to ensure that inspectors are knowledgeable in all pertinent regulations, policies, and procedures. Ensure that annual training keeps inspectors up-to-date on new technology, policies, and procedures.
3. Develop Individual Development Plans for inspectors designed to achieve career advancement strategies. Such strategies should promote sound succession planning and foster employee development and satisfaction.
4. Expand, to the greatest extent practicable, the sources from which BOEMRE draws inspector applicants, and identify incentives to recruit and retain inspectors. Re-evaluate whether inspectors can participate in the Student Loan Repayment Program and are eligible for hazard pay.
5. Consider developing more subject matter experts in the various types of inspections within district offices.

As discussed above, the recruitment of inspectors and other personnel, such as petroleum and systems engineers, necessary to fulfill the safety and enforcement mission of the Bureau is fundamental to improving the inspections program. Training and developing personnel in the inspections program is also important. The Bureau has assigned a team to review the current training program, identify skill sets that require further development, and recommend possible resources to provide additional training in the near-term. This report is scheduled to be delivered to the Director by November 2010. Development of comprehensive training programs and curricula, as well as career development programs for the Bureau's safety and enforcement personnel (and other employees in the Bureau) is also a long-term effort that will be closely analyzed and developed during the implementation of the reorganization. The Bureau will also consult with the Solicitor's office and the relevant federal agencies regarding the availability of loan forgiveness programs and other incentive and compensation programs that may enhance the Bureau's ability to recruit and retain safety and enforcement personnel.

C. Inspections: Personnel and Resources

The recommendations in this section of the Report relate to the workload and efficient utilization of personnel involved in the Bureau's safety and enforcement program.

Recommendations and Implementation

1. BOEMRE should undertake a comprehensive workforce and workload analysis of the inspection program, including succession planning, anticipated workload needs, and increased capacity, and implement appropriate recommendations.
2. Analyze ways to perform inspection activities more efficiently by using current technological tools, such as online review of reports and records and by using mobile technology in the field.
3. Information technology (IT) systems should be considered within the context of the BOEMRE reorganization. Specifically, BOEMRE should examine whether TIMS can be upgraded to meet business requirements and address user performance concerns by leveraging more current, web-based, user-friendly technologies together with existing tools already within the Department. BOEMRE should carefully consider factors such as speed, performance requirements, and cost-effectiveness.

These recommendations are directly tied to the infusion of additional resources into the Bureaus safety and enforcement program, including the hiring and distribution of new personnel and enhancements to the Bureau's information technology infrastructure. Further, these issues are central to the reorganization analysis and implementation. To evaluate these issues, a BOEMRE team has been assigned to report to the Director by November 2010 regarding measures to enhance the inspections program, including the use of mobile technology and web-based tools.

D. Management Support

These recommendations concern management issues relating to the development of policies and the provision of resources to support personnel involved in the Bureau's safety and enforcement program.

Recommendations and Implementation

1. Ensure that managers and inspectors have proper training, with emphasis on the importance of a strong safety culture.
2. Ensure that inspectors have appropriate technology, resources and management support for the issuance and defense of INCs.
3. Develop and implement clear rules of engagement for operations that are transparent to all entities, including both BOEMRE and industry personnel, particularly relating to industry exerting pressure on inspectors.

4. Further develop ethics rules and training that reflect the unique circumstances of working in the GOM with opportunities for questions and discussions.
5. Ensure that BOEMRE managers support and enforce established rules of engagement and ethics rules.

As discussed above, the provision of resources, training, and appropriate technological infrastructure is essential to improving the safety and enforcement program and are central considerations of the reorganization and the establishment of BSEE. Also as described above, Director Bromwich recently issued a policy providing guidance regarding reporting and responding to attempts by industry personnel to harass, intimidate, or improperly influence Bureau personnel with respect to the performance of their official duties, including the issuance of INCs based on inspection activity. The Bureau will continue to consider enhancements to this policy and ways to strengthen oversight and enforcement of these rules.

V. Enforcement: Financial Penalties and Incentives for Safety Compliance

This section of the Report contains a number of specific recommendations concerning the regulatory and civil enforcement regime for safety compliance.

Recommendations and Implementation

1. Reevaluate the full range of enforcement actions, including INCs, civil penalties, and lease suspensions and cancellations to determine whether the enforcement actions deter violations. For example, BOEMRE should consider sanctions for repeat offenders, including those who repeatedly engage in violations that do not trigger civil penalties under the current standards.
2. Consider evaluating INCs to determine which, if any, may be appropriate for an automatic assessment of a fine and how much the fine should be. BOEMRE's evaluation could be informed by a review of the penalty structure of other regulatory agencies.
3. Review the civil penalty process to determine whether a civil penalty case can be completed effectively in less time than the current one-year time period allowed to assess a civil penalty.
4. Evaluate the rates and the structure of the civil penalty program and, if necessary, initiate the legislative or rulemaking process to ensure that penalties are appropriately tied to the severity of the violation.
5. Evaluate the use of facility shut-in authority to ensure its appropriate and effective utilization.
6. Develop a transparent process and public notification policy for workplace safety incidents, offshore oil spill incidents, corrective actions, and proceedings related to INCs.
7. Require on-site follow-up inspections, or other forms of evidence, to document that operators have made the required corrections to INCs.

8. Improve the INC documenting and tracking system so the status and resolution of INCs are fully documented, properly tracked and corrected.

9. Consider updating the INC form and other operational reporting documents to require operators to certify under penalty of perjury that all information submitted to the agency is accurate.

10. Consider reevaluating, and making appropriate recommendations regarding, financial guarantees required from operators in case of catastrophic spills, linking the required level of financial guarantee to risk, past safety performance, and potential natural resource and economic damages.

11. Consider developing a voluntary self-disclosure policy as an incentive for companies that notify BOEMRE of safety concerns.

12. Consider working with Congress to establish whistleblower protections specifically for individuals employed in private sector oil and gas companies who disclose safety and environmental violations.

13. Consider changing the approval process for returning a facility or component to operation by limiting who has approval authority; creating a system for tracking approvals and disapprovals; and ensuring that all staff who have approval authority have access to and properly use the tracking system.

Many of the above recommendations are relevant to, and will be incorporated into, the current review and evaluation of the Bureau's safety and enforcement program, which includes an analysis that will be provided to the Director by November 2010 and the reorganization effort, particularly with respect to the development and establishment of BSEE. As to those recommendations relating to the legal and regulatory aspects of the enforcement regime – such as civil penalties and sanctions, financial guarantees from operators, development of a self-reporting or disclosure policy for industry, and whistleblower protections – the Bureau will consult with the Solicitor's office and review similar regimes and measures used by relevant agencies to evaluate enhancements in these areas, and where necessary we will suggest legislation.

We fully agree with the Safety Oversight Board that the civil enforcement regime that applies to offshore energy development, particularly the civil penalties and sanctions that currently are available to deter and punish violations of safety and environmental standards and regulations, must be substantially strengthened. Director Bromwich has addressed this issue publicly on a number of occasions and is committed to substantially increasing the rigor and aggressiveness of BOEMRE's enforcement program and related sanctions.

VI. Environment: Environmental and Cultural Resources Protection

The recommendations in this section of the Report relate to the balance between the dual mandates under the Outer Continental Shelf Lands Act (OCSLA), which require the Bureau to manage development of OCS resources while ensuring that such development is conducted in a manner that is safe for human and animal life and the environment.

Recommendations and Implementation

1. In future institutional structures implemented through the ongoing BOEMRE reorganization, separate the management of environmental functions from those of leasing and development to ensure that environmental concerns are given appropriate weight and consideration.
2. Consider creating a review panel within BOEMRE to resolve conflicts that arise during environmental and socio-cultural reviews.
3. Explore and encourage other processes, policies and incentives that promote a culture of balanced stewardship and evaluate existing policies and practices that may impede the ability to achieve this balance.

These recommendations directly relate to one of the central rationales underlying the reorganization and the separation of functions into BOEM and BSEE. The Board's recommendations will be considered as the roles and relationships of BOEM and BSEE are defined and then implemented through the reorganization.

VII. Post-Accident Investigation

These recommendations relate to the current program for investigating of accidents and incidents occurring on offshore facilities within the Bureau's jurisdiction.

Recommendations and Implementation

1. Consider restructuring the accident investigation program to dedicate additional full-time staff with appropriate training in accident investigations. Establish a supervisory chain, with investigative expertise, that includes responsibility and accountability in BOEMRE headquarters for the overall management of the accident investigations program.
2. Require operators to provide detailed descriptions of certain types of accidents (*e.g.*, gas releases), to determine whether accident investigations or other corrective actions are necessary.
3. Develop and implement internal procedures to fully conduct and document accident investigations, including basic investigation and evidence gathering protocol.
4. To supplement existing ethics requirements and recusal policy, create an independence policy for all accident investigation personnel that includes certifications signed by investigation personnel, prior to commencing work on a particular investigation, affirming the absence of any conflicts of interest.
5. Explore the utility of an independent peer review process for panel investigations.
6. Establish a system to track investigation recommendations and verify that they have been considered and implemented, as appropriate, and documented accordingly.

We are currently reviewing the Bureau's accident and incident investigations program, and the Safety Oversight Board's observations and recommendations will be incorporated into this review. The review involves personnel from the IRU as well as members of the accident investigation staff. We expect this review will result in the issuance of policy guidance and procedural changes on a rolling basis as necessary as well as a comprehensive report to the Director regarding policy and program improvements by early 2011. As a first step in that direction, we note that the investigation of the September 1, 2010, fire on Mariner Energy's Vermilion platform is being led by a member of the IRU with more than a decade of federal investigative experience and other investigative team members with substantial subject-matter expertise.

VIII. Environmental Stewardship: Regulatory Framework, OSRP Review, OSRP Content

A. Environmental Stewardship: Regulatory Framework

The recommendations contained in this section of the Report relate to the regulatory tools available to the Bureau and the process for developing and reviewing new regulations.

Recommendations and Implementation

1. Develop a dynamic regulatory framework that promotes efficiency in the development and promulgation of regulations; provides for interim and continuing guidance to operators; provides clear guidance and ensures the appropriate use of notices to lessees (NTLs) and safety alerts; addresses gaps, inconsistencies, comprehensiveness and organization within BOEMRE regulations; and facilitates working with other agencies to reconcile related regulations.
2. Ensure that BOEMRE has sufficient staff with the expertise needed to review and vet standards developed by industry group subject matter experts to determine the extent to which those standards should be used in developing regulations.
3. Identify actionable items from the TA&R studies, track concurrence and implementation of those items, document rejected recommendations, and consider broader opportunities for the TA&R program.
4. Consulting with technical experts, conduct further analysis of the effects of water depth on equipment and operations, and determine the adequacy of current regulations.

These recommendations are relevant to defining through the reorganization certain aspects of the roles and relationships of the new organizations BOEM and BSEE. We agree that the process for identifying regulatory gaps and areas for enhancement or modernization must be made robust, and this is an area that will receive significant attention in designing the structures, roles, and lines of communication between BOEM and BSEE. To facilitate this part of the reorganization analysis and to begin addressing

improvements in the Bureau's regulatory process, we are performing an operations functions analysis to be completed by the end of December 2010.[2]

B. Environmental Stewardship: OSRP Review

The recommendations in this section of the Report relate to the review and verification of OSRPs submitted by industry.

Recommendations and Implementation

1. Draft a new Memorandum of Agreement with the USCG, EPA, and other interested agencies, requiring appropriate participation of all parties in the review of OSRPs, and any related drills or exercises.
2. Develop a review process for OSRPs that incorporates risk-based and other strategies to ensure that all critical information and spill scenarios are included in the OSRP by operators, and are comprehensively reviewed and verified by BOEMRE and/or other appropriate officials.
3. Determine and ensure technical expertise necessary for staff to conduct comprehensive reviews of OSRPs.
4. Ensure that inspectors verify the availability and presence of all equipment, including third-party equipment, listed in OSRPs prior to conducting inspections.

The Bureau is actively reviewing the availability and adequacy of well containment and spill response resources in light of the *Deepwater Horizon* incident. We have multiple efforts ongoing in this area, including the series of public forums being conducted by Director Bromwich, which are obtaining substantial information on spill response-related issues. Although the public forums are specifically tied to the existing deepwater drilling suspensions, in fact the information being collected is of much broader importance.

In addition to gathering information through the public forums, the Bureau has engaged the USCG regarding the evaluation of OSRPs submitted by energy companies. The Director also has directed the Bureau to perform a comprehensive review of strategies with respect to spill response and OSRPs to be completed by early 2011. While this review is being conducted, BOEMRE personnel are working to develop interim guidance to ensure that spill response plans and resources are sufficient in light of the revised worst case discharge calculations required under NTL 2010-06. The Safety Oversight Board's recommendations in this area are relevant to the review that the Director has ordered, as well as to the reorganization analysis.

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[2] The Report suggests that BOEMRE review the use of NTLs and safety alerts to ensure that they are used appropriately. First, we note that safety alerts are merely advisories to lessees and operators about incidents or areas of concern and do not impose any enforceable requirements on offshore operations. Second, we agree that the Bureau must ensure that NTLs are used appropriately, including by, for example, obtaining legal review of draft NTLs. For example, both NTL 2010-05 and NTL 2010-06, issued following the *Deepwater Horizon* incident, were reviewed by the Solicitor's office. We are confident, and believe strongly, that both NTL 2010-05 and NTL 2010-06 were appropriate uses of NTLs.

C. Environmental Stewardship: OSRP Content

This final section of the Report concerns policies and procedures relating to the submission of information by industry concerning well containment and spill response.

Recommendations and Implementation

1. Develop policies and procedures to require detailed descriptions of containment and control measures for the source of possible spills and determine where to incorporate these measures, either in the OSRP or elsewhere in the permitting process.
2. Review calculations for worst-case discharges, with input from United States Geological Survey, and make recommendations for changes to 30 CFR 254.47 as appropriate.
3. Conduct additional research on containment and control measures to determine appropriate requirements for oil discharge at the source.

As described in the previous section, the Bureau is actively reviewing the availability and adequacy of well containment and spill response resources in light of the *Deepwater Horizon* incident, including but not limited to the Director's eight public forums being conducted from early August through mid-September. The Director also has directed the Bureau to perform a comprehensive review of strategies with respect to spill response and OSRPs to be completed by early 2011. While this review is being conducted, BOEMRE are working to develop interim guidance to ensure that spill response plans and resources are sufficient in light of the revised worst case discharge calculations required under NTL 2010-06. The Safety Oversight Board's recommendations in this area are relevant to the review that the Director has ordered.

IX. Conclusion

The Report reflects a comprehensive and thorough effort to fulfill the Secretary's direction that the Board develop information and provide recommendations to strengthen the Department's management and regulation of offshore energy development. The Safety Oversight Board's recommendations are constructive and directly relevant to the broad-based reforms that the President and Secretary have ordered be implemented to improve the management and safety of offshore energy development on the OCS. We thank the Board for its valuable Report and recommendations.

The Report is only one among a large number of studies, reviews, and investigations being conducted by various entities of the former MMS. This obviously creates a risk that because the results of these reviews will continue to flow in over time, and they are based largely on the state of affairs within MMS as of April 20, 2010, the view of BOEMRE will continue to be frozen in the past and will not keep up with the reform efforts that are currently in full-swing. That is misguided and unfair. It is critically important that as these reform efforts continue, the Department and the outside

world acknowledge them and recognize the enormous transformation the agency is undergoing.

Drilling moratorium

MEMORANDUM

To: Director, MMS

From: Secretary

Re: Suspension of Outer Continental Shelf (OCS) Drilling of New Deepwater Wells

Date: May 28, 2010

The recent blow-out and oil spill in the Gulf of Mexico is new evidence of the serious risks associated with deepwater drilling, and presents new challenges for the Department to assure the American public that OCS deepwater drilling can be accomplished in a safe and environmentally sound manner.

Yesterday, I presented recommendations to the President based on a 30-day review of the BP Explosion and Oil Spill that began on April 20, 2010. Based on that review, the recommendations contained in the report to the President, and further evaluation of the issue, I find at this time and under current conditions that offshore drilling of new deepwater wells poses an unacceptable threat of serious and irreparable harm to wildlife and the marine, coastal, and human environment as that is specified in 30 C.F.R. 250.172(b). I also have determined that the installation of additional safety or environmental protection equipment is necessary to prevent injury or loss of life and damage to property and the environment. 30 C.F.R. 250.172(c).

Therefore, I am directing a six month suspension of all pending, current, or approved offshore drilling operations of new deepwater wells in the Gulf of Mexico and the Pacific regions. This suspension does not apply to drilling operations that are necessary to conduct emergency activities, such as the drilling operations related to the ongoing BP oil spill. For those operators who are currently drilling new deepwater wells, they shall halt drilling activity at the first safe and controlled stopping point and take all necessary steps to close the well. In addition, MMS shall not process any new applications for permits to drill consistent with this directive. All applicable regulations shall apply to the implementation of this directive.

Please ensure that appropriate Letters of Suspension and any other appropriate documentation, including any additional instructions and details regarding this directive, are sent to all affected lessees, owners, and operators immediately.

Bloomberg Businessweek Monday September 20, 2010

Available on the iPad

Obama's Drilling Ban No Longer Needed, Report Finds

August 26, 2010, 5:06 PM EDT

By Jim Efstathiou Jr. and Alison Fitzgerald

(Updates with comment from Reilly in fifth paragraph.)

Aug. 26 (Bloomberg) -- President Barack Obama's moratorium on deep-water drilling is no longer needed because new rules reduce the risk of an uncontrolled spill, according to a report for a panel investigating BP Plc's blowout.

Rules issued in June by the Interior Department "provide an adequate margin of safety to responsibly allow the resumption of deep-water drilling," according to the report today from the Bipartisan Policy Center, a Washington-based research group. The rules, if followed by BP, Apache Corp. and other drillers, and enforced by regulators, "will achieve a significant and beneficial reduction of risk."

The report was prepared for the presidential commission investigating the BP spill. Its leaders, former Environmental Protection Agency Administrator William Reilly and former Democratic Senator Bob Graham of Florida, have questioned the need for the moratorium, which is scheduled to expire Nov. 30.

"It confirms what we've been saying in Louisiana, that a six-month moratorium is arbitrary and capricious," Louisiana Lieutenant Governor Scott Angelle, a Democrat, said today in an interview. The rules "have created an environment where a bipartisan, independent group says we can get back to work. We need to start issuing permits."

The president's commission, charged with making policy recommendations to prevent future oil spills, didn't endorse the report's findings. The "analysis will help inform considerations as we continue our examinations of the Gulf spill," Reilly said in a statement.

Hearings to Mid-September

Interior Secretary Ken Salazar and Michael Bromwich, head of the Bureau of Ocean Energy Management, the Interior office that oversees offshore drilling, have said the ban in the Gulf of Mexico can be lifted early if the industry shows it has improved safety and developed means to contain another spill.

The moratorium is unlikely to end before a series of public hearings on the oil spill conclude in mid-September, Bromwich said today.

"I am in the process of conducting meetings across the country with technical experts to see how we can allow deep- water drilling to safely resume," Bromwich said in a statement. "Before that, however, we need to ensure that workplace and drilling safety, spill response and containment issues are appropriately addressed by industry."

The administration halted drilling in waters deeper than 500 feet after BP's Macondo well, about 40 miles (64 kilometers) off the Louisiana coast, blew out April 20. The explosion killed 11 workers and set off an uncontrolled oil spill that spewed 4.9 million gallons, the most in U.S. history.

Government, Industry 'Unprepared'

"The need to impose a moratorium in the first place demonstrates just how unprepared both government and industry were to deal with an accident of this magnitude," said Jason Grumet, president of the Bipartisan Policy Center. "The Interior Department has done a good job of quickly implementing a far more rigorous regime for deep-water drilling."

He said oil companies worked with the department to develop the standards.

Contributors to the report issued today also include Elgie Holstein, senior director for strategic planning at the New York-based Environmental Defense Fund, and Joe Perkins, former global management development director at Schlumberger Ltd., the world's largest oilfield-services contractor.

Government officials from Gulf Coast states say the drilling ban is damaging a region of the country already suffering because of the spill. The moratorium idled 33 rigs and may cost 23,247 jobs, by the administration's own estimate. Two Gulf rigs, owned by Houston-based Diamond Offshore Drilling Inc., have since left the Gulf to drill elsewhere.

Verification Required

Offshore drillers must now provide third-party verification that equipment such as blowout preventers, a device that failed at BP's well, is working. Operators must also estimate the amount of oil that could gush from an undersea well if systems designed to cap the flow fail in an emergency.

The regulations present "impediments to drilling now," regardless of when the moratorium ends, Jim Tisch, chief executive officer of Loews Corp., said in an interview yesterday at Bloomberg headquarters in New York. Loews owns 50 percent of Diamond Offshore, the largest U.S. deep-water oil driller.

It may take until mid-2011 before new permits are issued as companies work through the new regulations, according to Michael McKenna, president of MWR Strategies, an oil-industry consulting firm in Washington.

"All companies must be held to a consistent set of safety standards even if it delays or even discourages some rigs from drilling in the Gulf," Grumet said.

'More Questions'

Earlier this month, the commission asked Bromwich if the moratorium should be lifted for rigs that present lesser risks. His response fell short, Reilly said

yesterday during a commission hearing.

"What we heard was a recital of the number of the things, some very good things, that have happened since the Macondo blowout," Reilly said at a press conference. "But we have more questions."

--Editors: Larry Liebert, Steve Gelmann

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Estimating the Economic Effects of the Deepwater Drilling Moratorium on the Gulf Coast Economy

Inter-Agency Economic Report

September 16, 2010

Executive Summary

The BP Deepwater Horizon drilling rig, situated about 50 miles off the coast of southern Louisiana, exploded on April 20, 2010, resulting in 11 deaths, 17 injuries, and one of the worst environmental disasters in U.S. history. In response, the Secretary of the Interior exercised his authority to suspend certain deepwater drilling activities. Given uncertainty about the adequacy of existing safety regulations, the moratorium provided time to determine whether and how deepwater drilling could continue in a safe and environmentally-sound manner. The current moratorium is in effect until November 30, 2010. This report estimates the economic consequences of this moratorium in the five Gulf Coast states.

Evidence on employment, unemployment and unemployment insurance (UI) claims in the parishes most affected by the deepwater drilling moratorium indicates that there have not been large increases in unemployment or decreases in employment in these parishes. These data do not indicate that there has been no employment impact associated with the drilling moratorium, but they do suggest that any losses have not been large to date, since significant losses would have shown up in the employment, unemployment and UI claim activity data.

Based on conversations with a number of rig operators along with other publicly-available information, we estimate that during the six-month period of the moratorium average employment of rig workers in the Gulf of Mexico fell by about 2,000. Total spending by drilling operators is estimated to decline $1.8 billion over the six-month period. This direct reduction in spending by the rigs impacts employment in the industries that supply the Gulf drilling industry and then in all other industries affected by declines in consumer and business spending. To capture all of these related employment changes, we apply a multiplier to the direct reduction in spending in order to estimate the total decline in Gulf Coast employment as a result of the moratorium.

We estimate that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico.

For reasons described in the report, we expect this impact to be more heavily concentrated in smaller businesses than in the larger companies operating in the Gulf Coast. These estimates are lower than estimates from earlier studies. There are several reasons for the difference, but a primary reason is that many deepwater drilling operators and contractors have retained most of their employees. Earlier studies assumed that all employees would be let go.

The other primary economic consequence of the moratorium is delayed oil production. Consistent with other studies, we estimate that the moratorium will reduce Gulf of Mexico oil production by about 31,000 barrels per day in the fourth quarter of 2010 and by roughly 82,000 barrels per day in 2011. These are small reductions compared to world production, and are occurring at a time when both crude oil and product inventories and global spare oil production capacity are at high levels, hence they are not expected to have a discernable effect on the price of oil.

Estimating the Economic Effects of the Deepwater Drilling Moratorium on the Gulf Coast Economy

1. Introduction

The BP Deepwater Horizon drilling rig, situated about 50 miles off the coast of southern Louisiana, exploded on April 20, 2010, resulting in 11 deaths, 17 injuries, and one of the worst environmental disaster in U.S. history. This disaster happened after the oil and gas industry had repeatedly assured the American public that such a disaster was not possible.

In response, the Administration acted to ensure that safety regulations were in place to minimize the likelihood of future similar events. On May 28, 2010, the Secretary of the Interior directed the Minerals Management Service, now the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) to exercise its authority to suspend certain deepwater drilling activities. This decision was challenged in court and was preliminarily enjoined. The Secretary immediately complied with the court's preliminary injunction. To address the continuing risk posed by certain drilling operations, the Secretary examined the options available for managing the Outer Continental Shelf ("OCS") in a safe and environmentally sound manner and ultimately issued a new suspension decision on July 12, 2010. The current moratorium is in effect until November 30, 2010.

The suspension was imposed at a time when there was little understanding of the cause of the BP Deepwater Horizon explosion. It has provided time to ensure that the appropriate workplace and drilling safety measures are in place, and to develop strategies for the containment of wild wells in deepwater. The long-term safety of the drilling industry in the Gulf is important to its economic viability as well as to the Gulf Coast environment. (Throughout this report, "Gulf Coast" refers to the five Gulf Coast states of Texas, Louisiana, Mississippi, Alabama, and Florida.)

During the crisis, the Administration has closely monitored the deepwater drilling industry and the Gulf of Mexico's coastal community and has been able to update and refine its estimates of the economic impacts of a temporary deepwater drilling moratorium. For this report, we talked with several of the deepwater rig operators and contractors who operate in the Gulf of Mexico to ascertain how their firms have responded to the moratorium. At this time, employment effects from the moratorium appear to be limited. Almost all of the deepwater rigs in the Gulf of Mexico at the time of the first moratorium remain in the Gulf of Mexico; drilling contractors have decided, to date, to retain most of their crews; rig operators have implemented only minimal layoffs; and well servicing firms have largely retained their employees, though some have been deployed to work in regions outside of the Gulf of Mexico. Aggregate employment data do not show a meaningful adverse effect in the five Louisiana parishes that support most deepwater drilling activities. The total number of workers employed in Terrebonne, Lafourche, Lafayette, Iberia, and St. Mary parishes was higher in July, two months into the moratorium, than in April. Also, these five parishes' share of Louisiana unemployment insurance claims has declined from April through August.

Using information from our conversations with deepwater rig operators and contractors, coupled with information from a variety of other sources, this report provides updated estimates of the potential economic effects of the moratorium on employment. We estimate that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico.

This study, like previous studies, assumes that normal drilling operations would have been in place in the absence of the moratorium. In reality, the safety concerns generated by the BP Deepwater Horizon oil spill would have almost surely resulted in some short-term drilling slowdown due to safety concerns and the development of new regulations. This suggests that our estimates likely overstate the true job reductions due to the moratorium itself.

For reasons described below, we expect employment effects to fall more heavily on smaller businesses than on the larger companies operating in the Gulf Coast. We have heard repeatedly about the problems facing small businesses in the Gulf Coast that depend on the drilling industry for their survival, and this finding reinforces those concerns.

The reduced employment estimates here are lower than those of earlier studies. There are many reasons for this difference, which we detail in section 6, but one of the primary reasons is that contrary to the worst-case assumptions in prior studies, many deepwater drilling operators and contractors have kept most of their employees on payroll. Earlier studies assumed that these employees would have been let go. One of those earlier studies was a preliminary analysis by the Department of the Interior that estimated that 23,000 jobs in the Gulf Coast region could be lost temporarily as a result of the moratorium.

In addition to the job reductions due to reduced spending during the moratorium, the other primary economic consequence of the moratorium is a reduction in oil exploration and production over the period of the moratorium. Consistent with other studies, we estimate that the moratorium would reduce Gulf of Mexico oil production by about 31,000 barrels per day in the fourth quarter of 2010 and by roughly 82,000 barrels per day in 2011. However, none of this production is permanently lost as a result of the moratorium; instead the production is simply delayed as these resources will be available for production following the resumption of deepwater drilling in the Gulf of Mexico. Given that these are small reductions compared to world production, and are occurring at a time when both crude oil and product inventories and global spare oil production capacity are at high levels, they are not expected to have a discernable effect on the price of oil.

The structure of this report is as follows. Section 2 describes the history of the moratorium. Section 3 lays out evidence that the impact of the moratorium on employment has been less than anticipated by initial studies. Section 4 follows with a description of the deepwater drilling industry and estimates of how much the deepwater drilling industry has reduced its employment. Section 5 describes our estimate of reduced spending during the length of the moratorium. Section 6 delves into the issue of how to appropriately translate this direct reduction in spending into changes to the broader economy using multiplier analysis. Another economic cost is the

delay in oil production as a result of the moratorium, and those results are discussed in section 7. Section 8 concludes.

2. Description and History of the Moratorium

On May 28, 2010, the Secretary of the Interior directed the Minerals Management Service, now BOEM, to exercise its authority under the Outer Continental Shelf Lands Act (OCSLA) and its implementing regulations to suspend certain deepwater drilling activities.[1] Accordingly, BOEM issued a Notice to Lessees and Operators ("NTL") suspending most new drilling operations in the Gulf of Mexico and the Pacific region for operations in water depths greater than 500 feet for a period of six months.

The NTL did not apply to drilling and extraction activity in water depths less than 500 feet or to producing wells in deeper water.[2] According to the Louisiana Mid-Continent Oil and Gas Association, the moratorium does not affect the 591 producing deepwater wells or the over 4,500 shallow water wells in the Gulf of Mexico.[3] The Department of the Interior estimates that there are a total of 80,000 offshore oil and gas production, construction, and drilling workers in the Gulf of Mexico. As described below, fewer than 10,000 of these workers were employed on rigs affected by the moratorium.

On June 7, certain providers of support services to offshore oil and gas operations in the Gulf of Mexico filed a lawsuit in the Federal District Court for the Eastern District of Louisiana seeking to invalidate the May 28 suspension (the "*Hornbeck* litigation"). On June 22, the Court preliminarily enjoined enforcement of the suspension. The Department of the Interior appealed the Court's decision and requested that the U.S. Court of Appeals for the Fifth Circuit stay the injunction pending appeal. On July 8, the Fifth Circuit denied the stay motion on the grounds that the Department had not shown irreparable harm because there was no indication that the drilling activities subject to the suspension were likely to resume, but made clear that the government could seek emergency relief if such activities did resume or were imminent.

On July 12, the Secretary of the Interior issued a decision memorandum imposing a second suspension of drilling operations in deep water. The July 12 suspension decision defined the drilling operations subject to the suspension based on the equipment configuration used in conducting the operation. Specifically, the July 12 suspension applies, with certain exceptions,

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[1] OCSLA authorizes the promulgation of regulations for the "suspension or temporary prohibition of any operation or activity, including production, pursuant to any lease or permit . . . if there is a threat of serious, irreparable, or immediate harm or damage to life (including fish and other aquatic life), to property, . . . or to the marine, coastal, or human environment . . . ." 43 U.S.C. § 1334(a)(1). Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) regulations provide that the agency may order suspensions of operations when activities "pose a threat of serious, irreparable, or immediate harm or damage" to human or animal life, property, any mineral deposit, or the marine, coastal, or human environment as described in Section 1334(a)(1) above or "[w]hen necessary for the installation of safety or environmental protection equipment." 30 C.F.R. §§ 250.172(b)-(c).

[2] The specific NTL was No. 2010 N-04.

[3] "Impacts of President Obama's Order Halting Work on 33 Exploratory Wells in the Deepwater Gulf of Mexico," May 28, 2010.

to the drilling of wells using subsea blowout preventers (BOPs) or surface BOPs on a floating facility.

Similar to the May 28 suspension, the July 12 suspension does not apply to production activities; drilling operations that are necessary to conduct emergency activities, such as the drilling operations related to the BP Deepwater Horizon event; drilling operations necessary for completions or workovers (where surface BOP stacks are installed, they must be utilized during these operations); abandonment or intervention operations; or waterflood, gas injection, or disposal wells. BOEM ordered any current drilling operations covered by the suspension to proceed to the next safe opportunity to secure the well and take all necessary steps to cease operations and temporarily abandon or close the well. Thus drilling activity in deepwater did not immediately stop on May 28, given the excepted activities and the need to reach a safe opportunity in the drilling horizon before temporarily abandoning a given well.

As detailed in the Secretary's July 12 Decision Memorandum, there are three primary reasons for a temporary pause in certain deepwater drilling operations. First, the suspension allows time to review existing safety activities and to implement appropriate new workplace and drilling safety measures. Second, the suspension provides BOEM, industry, and other participants time to develop strategies for the containment of wild wells in deepwater. Third, given that all available spill response and containment resources were occupied with the BP Deepwater Horizon spill, the pause in drilling ensures that appropriate and sufficient response resources would be available in the event of another major oil spill.

The current suspension of new deepwater drilling activity is effective until November 30, 2010. However, the July 12 Decision Memorandum makes clear that the suspension could be lifted earlier than November 30 if "the safety, containment and response issues that have created the need for a suspension have been resolved, or if those three issues are addressed to a degree that can be determined upon further study to ensure an acceptable margin of safety." The Secretary of the Interior directed BOEM to continue collecting and analyzing information – including information obtained through public forums and outreach involving members of industry, academia, non-governmental organizations, elected officials, and the general public – regarding each of the three primary reasons underlying the temporary suspension of deepwater drilling. BOEM is required to report its findings and recommendations regarding whether modification to the scope or duration of the deepwater drilling moratorium would be appropriate by no later than October 31, 2010, and earlier than that if possible.

3. Employment in Louisiana Parishes that Support Deepwater Drilling

Observed changes in employment in those Gulf Coast areas that support deepwater drilling can provide an initial sense of the possible magnitude of the impact of the deepwater drilling moratorium. In contrast to early studies that made assumptions about the number of rig workers laid off and subsequent impacts on economic activity, in this study we have surveyed a number of rig operators about their personnel and rig decisions and reviewed the regularly collected data on unemployment insurance and employment activity by parish/county and by state. In this section we present these aggregate employment data. In the following two sections we discuss

the economics of offshore drilling and describe our estimates of the changes in employment and spending on the rigs following the moratorium.

We look at employment and unemployment data in the five contiguous Louisiana parishes widely believed to be heavily dependent on the deepwater drilling industry. If there are noticeable labor market effects from the drilling moratorium, these parishes should be among the areas most affected. As this section indicates, based on the most recently available data, these five parishes have yet to experience significant changes in their overall labor markets, and that conclusion holds when they are compared to the rest of Louisiana or to the entire country.

The labor market data available at the parish level include monthly estimates of employment and unemployment from the Department of Labor's Bureau of Labor Statistics as well as continuing and initial unemployment insurance (UI) claims provided by the state of Louisiana through the Department of Labor's Employment and Training Administration.[4] The five parishes that we focus on are:

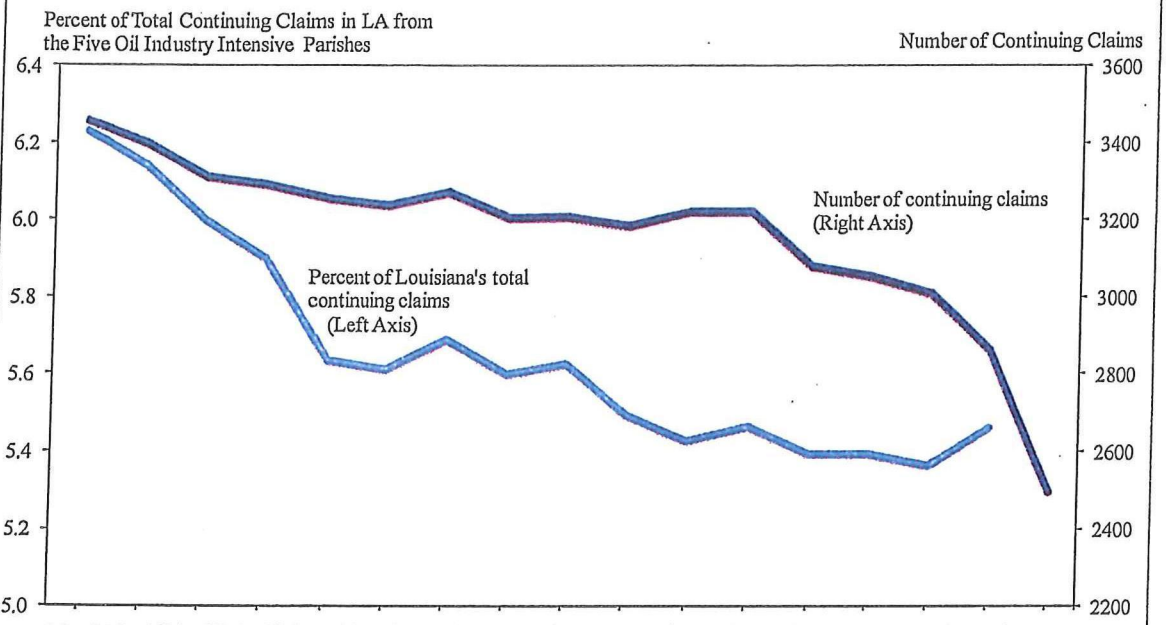
- Lafourche (home to Port Fourchon);
- Lafayette (home to about one-third of Louisiana's oil and gas drilling industry);
- St Mary's (home to Morgan City);
- Terrebonne (home to Houma); and
- Iberia (home to about 10 percent of Louisiana's oil and gas drilling industry).

Weekly UI data can illustrate whether a parish or region has experienced a recent increase in workers losing their jobs. Figure 1 shows the number of continuing UI claims in these five parishes and also their share of statewide continuing UI claims through August. Both measures have trended down during the summer, indicating that the number of continuing UI claims has fallen in these parishes, both in absolute terms and relative to the rest of Louisiana. Of course, the number of continuing claims does not measure the flow of workers into the UI program but only measures the number of eligible workers receiving their weekly benefit at a given point in time. Initial (new) UI claims provide a better measure of the number of workers entering unemployment. At the national level, let alone the parish level, the initial claims data exhibit great week-to-week volatility, which makes them difficult to interpret. Nonetheless, there appears to be little trend up or down in initial UI claims in these five parishes.

Further evidence on UI claims comes from data in three states—Louisiana, Mississippi, and Texas—that ask UI recipients whether their claims are related to the moratorium. The number of UI recipients who have responded positively to this question is but a sliver of the total claims activity in each state. Based on the responses through September 13, 2010, only 734 moratorium-related continuing claims have been filed to date in Louisiana, 22 in Mississippi, and 64 in Texas. In contrast to these 820 claims, total continuing claims in those three states currently number in excess of 300,000.

[4] Local area estimates of persons employed are published by the Bureau of Labor Statistics' Local Area Unemployment Statistics program and are available online at www.bls.gov/lau. Nonfarm payroll job estimates for states and metropolitan areas are published by the Bureau of Labor Statistics' Current Employment Statistics program and are available online at www.bls.gov/sae.

Figure 1
Continuing Unemployment Insurance Claims for Five Oil Industry Intensive Parishes in Louisiana: May 8-August 28, 2010



The five parishes in southern Louisiana with large oil drilling related industries are Terrebonne, Lafourche, Lafayette, Saint Mary's and Iberia.
Source: U.S. Department of Labor

Not all persons who lose their employment are eligible for UI. Self-employed persons, for example, are not eligible. Thus, self-employed persons who lost their job because of the moratorium are unlikely to be reflected in the UI data. The Administration proposed in its May legislative package to extend UI coverage to such workers who lose their jobs as a result of a Spill of National Significance.

At the same time as the moratorium has been in effect, there have also been significant resources devoted to oil spill containment and clean-up in Louisiana. Monthly employment data for these parishes can illustrate the net effect of all changes (including other economic factors not related to the oil spill). Employment levels and unemployment rates by parish are summarized in Figure 2 and Table 1. Figure 2 indicates that employment as of mid-summer was at about the same level as at the beginning of 2009. There is no evidence of declining employment after the moratorium was announced.

As Table 1 shows, employment in these five parishes actually increased from April to July by 0.7 percent, nearly identical to the rate of increase for the nation and the state of Louisiana. A similar story holds for the unemployment rate: The unemployment rate increased 0.9 percentage points in the oil industry-intensive parishes, compared to a 1.4 percentage point increase for the state as a whole, and a 0.2 percentage point increase across the United States.

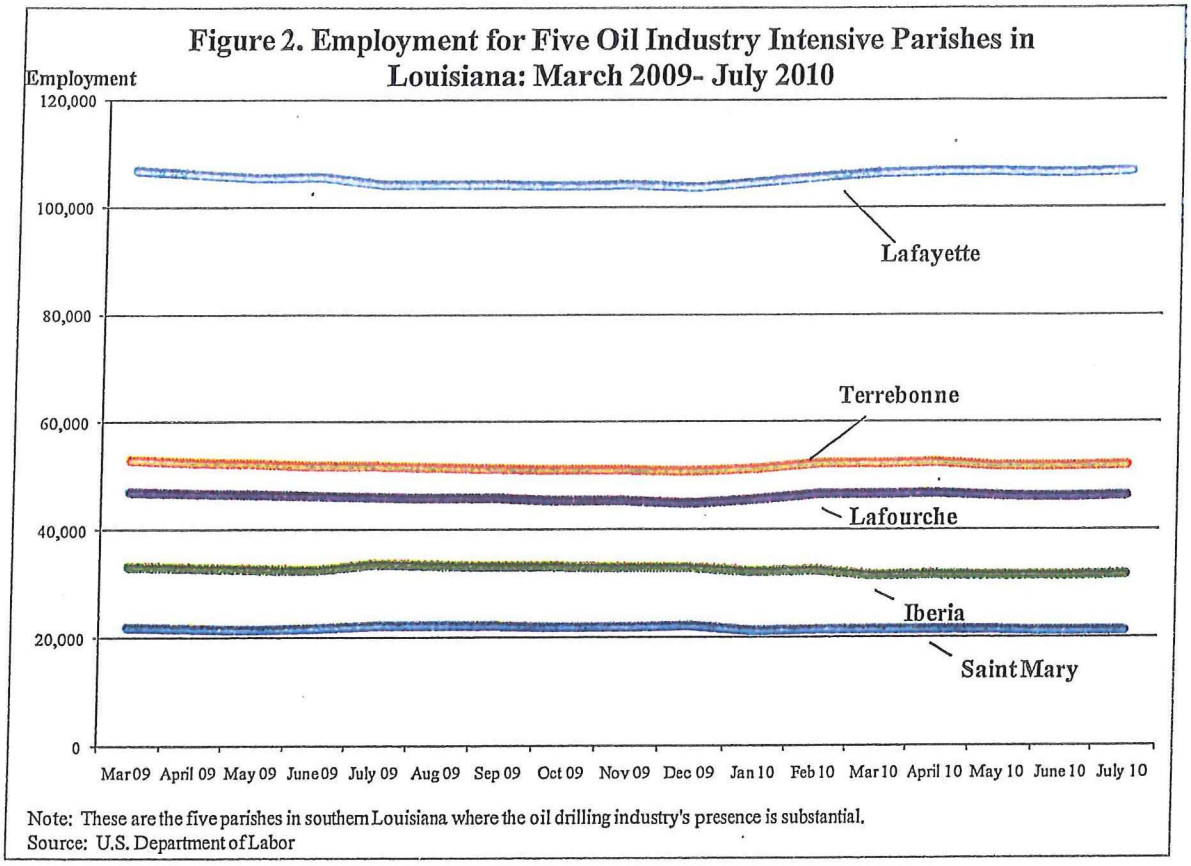


Table 1: Employment Changes from April 2010 to July 2010 for Five Oil Industry Intensive Parishes in Louisiana

(Not Seasonally Adjusted)

	------Employment Level (in thousands)------				--Unemployment Rate---		
	April	July	Change	%Change	April	July	Change
U.S. total	139,302	140,134	832	0.6%	9.5	9.7	0.2
Louisiana	1,958.6	1,971.9	13.3	0.7%	6.2	7.6	1.4
Total for 5 parishes	259.5	261.2	1.7	0.7%	5.2	6.1	0.9
Iberia	31.4	31.9	0.5	1.6%	6.8	7.7	0.9
Lafayette	107.2	108.1	0.9	0.8%	4.7	5.7	1.0
Lafourche	46.8	47	0.2	0.3%	4.4	5.0	0.6
Saint Mary	21.4	21.5	0.1	0.5%	8.0	9.3	1.3
Terrebonne	52.6	52.8	0.2	0.4%	4.8	5.3	0.5

Source: Author's calculations using data from the Bureau of Labor Statistics, Current Population Survey (U.S. total) and Local Area Unemployment Statistics program (statewide and parish).

These data do not indicate that there has been no employment impacts associated with the drilling moratorium, but they do suggest that any losses have not been large to date, since significant losses would have shown up in the employment, unemployment and UI claim activity data. The data also suggest that the net employment effect of the moratorium and spill response – from hiring coastline clean-up workers to deploying vessels of opportunity for skimming to supporting the well containment efforts at the MC252 site – does not appear to be large.

4. The Economics of Deepwater Drilling

This section lays out some of the basic parameters of the Gulf of Mexico deepwater drilling industry as it operated in April 2010, including estimates of the industry's employment and spending on personnel, supplies, and materials. In addition to tapping traditional sources of information about the industry, we spoke at length with a number of firms involved in drilling operations in the Gulf of Mexico to fill in gaps that traditional sources could not address. These firms included drilling contractor, operator and well service firms. Our conversations were conditioned on a promise of confidentiality to help ensure candid responses to our questions. As a result, to the extent we rely on information from these conversations, we use only summary-level information rather than firm-specific information, and we do not identify any of these firms by name. Because it was not practical to speak with every firm involved in drilling operations in the Gulf of Mexico, we arranged to speak with firms that could provide information about a large portion of the rigs and employees. Taken together, the firms we spoke with had direct knowledge of over 50 percent of the semisubmersibles and drillships and their associated workers in the Gulf of Mexico at the time the first moratorium began.

Although definitions vary, drilling is generally considered "deepwater" if it is in water depths of more than 500 or 1,000 feet. There are basically three kinds of deepwater drilling rigs: semi-submersible drilling rigs, drillships, and platform rigs.[5] To reduce confusion, in this report "rig" refers to any of these three types of vessels.

To obtain employment estimates of rig workers, several analysts have computed the average employment by type of vessel and the depth of water in which it is working. For instance, the number of rig workers can range from approximately 50 for platforms up to 300 for drill ships and semi-submersibles. For the set of deepwater rigs active in the Gulf of Mexico at the time the first moratorium was announced, the average number of rig workers employed on semi-submersibles and drill ships was about 260 per rig. Deepwater drilling employment before the BP Deepwater Horizon explosion is estimated to total about 9,700, an estimate very close to those used by earlier studies.

A complicating factor is the complex employment arrangements for these rig workers. Only a portion work directly for the drilling operators (for instance, only a few of the workers on the BP Deepwater Horizon rig were BP employees). Drilling operations also include rig workers

[5] The BP Deepwater Horizon, for example, was an ultra-deepwater semi-submersible drilling rig.

employed by the drilling contractor, the company that leases the drilling rig to the operator. There are also usually a number of well service rig workers who are hired on a contract basis by the operator to perform services like well logging, well testing, operations monitoring, and drilling fluid and cementing services. All of these workers work on the rig and are considered "rig workers" in this report.

Although most economic studies of the moratorium focus on employment, employment is only one component of rig spending. Another important aspect of deepwater drilling is the large amounts spent on leasing the vessels, supplies, services, and materials. These expenditures support a network of onshore businesses that serve the deepwater drilling economy.

The costs of leasing and operating a deepwater rig are estimated to average about $720,000 per day for semi-submersibles and drill ships. Adding in an estimate for platforms, spending for deepwater rigs operating in the Gulf of Mexico prior to the April 2010 explosion is estimated to have totaled about $800 million per month. Spending to operate these same rigs for six months would total close to $5 billion.

5. Changes in Rig Employment and Spending as a Result of the Moratorium

There are a number of factors that influence employment and spending by deepwater drilling rigs during the moratorium located in the Gulf of Mexico. These factors include the number of rigs still working, the number of rigs that have left the Gulf of Mexico, and the activity levels on the remaining rigs. Based on a variety of reports and industry contacts, the following facts describe the situation following the announcement of a temporary suspension of deepwater drilling:

- Even though many deepwater rigs have discontinued drilling operations, almost all of the deepwater rigs in the Gulf of Mexico at the time of the first moratorium remain in the Gulf of Mexico: As of September 10, 2010, 41 out of the 46 rigs in the Gulf as of April 20 have remained in the region.

- Even though many deepwater rigs that remain in the Gulf of Mexico are not currently working, drilling contractors have decided, to date, to retain most of their crews. Similarly, rig operators have implemented only minimal layoffs, and well servicing firms have largely retained their employees, though some have been deployed to work in regions outside the Gulf of Mexico. The primary reason for retaining these employees, based on our conversations with rig contractors and operators, is that it would be expensive to rehire or replace these highly skilled and specialized employees in the near future. Furthermore, many of the rig owners have found ways to avoid costly temporary layoffs by redeploying some of these workers temporarily into non-drilling activities such as equipment maintenance and upgrading.

- Industry participants acknowledged that their current business decisions pertaining to rig departures and worker layoffs could not be sustained during a longer moratorium, but for now they are taking a wait-and-see approach. As long as it appears that the moratorium

will end within the announced six-month period or sooner, it is unlikely that workers who have been retained through early September will be laid off in the next few months.

- Although rig worker employment has not fallen a great deal, a large number of rigs are no longer conducting operations. As a result, operator spending has declined. Since most operators maintain long-term deepwater rig leases, they must continue to pay their leasing commitments, but they have reduced their other spending by substantially lowering their other costs (such as for supplies, materials, and services) which are more discretionary.

When the first moratorium was announced, many commentators and local political leaders worried that the predicted that operators would move many, if not most, deepwater rigs out of the Gulf of Mexico and rig workers would quickly be laid off.[6] Three months into the moratorium, those predictions have not proven true.

Based on conversations with industry participants and publicly available information, we estimate that during the six-month period an average of about 2,000 rig workers will have been laid off or left the Gulf Coast, or about 20 percent of the 9,700 rig workers employed in the Gulf of Mexico in April 2010. To the extent that there are larger employment effects on the Gulf Coast economy from the moratorium, they will likely come from the reduction in operator spending, particularly the costs related to drilling supplies, services and materials. To estimate the magnitude of this potential reduction we assume:

- Spending per rig remains the same for any rigs that continue working.[7]

- The reduction in the number of working rigs from the Gulf of Mexico since April 2010 was a result of the moratorium and that all spending in the Gulf Coast associated with those rigs has ceased.

- For rigs that remain in the Gulf of Mexico, but are idle, half of average spending per rig goes into leasing the rig itself (which includes the payments to the drilling contractor workers who remain on the rig) and this spending is unaffected by the moratorium.[8] We assume a small share of the non-leasing costs continue to be paid, to cover basic supplies and equipment for the crew remaining on the rig. The remaining non-leasing costs, which typically go to support drilling operations, are set to zero.

Based on these assumptions, we estimate that over the six months of the deepwater moratorium, total operator spending will be reduced by about $1.95 billion. However, this estimate does not

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[6] One such article that highlighted large potential job losses to the state of Louisiana was "Obama's Drill Ban May Trigger Job Losses, Slow Gains (Update1)," June 4, *Businessweek*, http://www.businessweek.com/news/2010-06-04/obama-s-drill-ban-may-trigger-job-losses-slow-gains-update1-.html

[7] This assumption is based on conversations with rig operators and contractors.

[8] As a result of the moratorium, some of the leasing agreements may have been modified to lower the payments. However, as these reduced payments reflect changes in financial transfers between large companies, these reduced leasing payments are assumed to have no direct impact on employment in the Gulf Coast.

account for the fact that the reductions in operator spending are partially offset by wage replacement ($141 million) for some of the rig workers.[9] Although many well service rig workers will no longer be hired by the operators, conversations with several industry participants indicate that most well service rig workers remain employed and are still being paid. In addition, we anticipate the Rig Worker Assistance Fund established by BP will partially compensate well service rig workers and drilling contractor rig workers who are laid off.[10] In short, while the rig operators may be spending less money for drilling operations, not all of this reduced spending is lost to the economy or the workers. Greater details behind this calculation are provided in the Appendix.

Table 2 summarizes the basic features and changes in the deepwater drilling economy. The results in the final row present our estimate that direct spending on deepwater drilling will be reduced by $1.8 billion as a result of the moratorium.

Table 2. Summary of the Change in the Deepwater Drilling Economy During the Moratorium

	As of April 2010	During 6 Month Moratorium	Difference
Number of rig workers	9,660	7,700*	-1,960
Spending ($ billions)**			
Gross operator spending	4.82	2.87	-1.95
Wage replacement offset		0.14	0.14
Total change in costs			-1.81

* Estimated six-month average. ** Estimated six-month total.

6. Using the Appropriate Multiplier to Measure the Full Effect of Spending Reductions on Gulf Coast Employment

This section addresses how the estimated $1.8 billion reduction in direct spending during the six months of the moratorium affects employment in the Gulf Coast. A decline in spending by the drilling industry can affect many parts of the economy because many businesses in the Gulf Coast, and throughout the rest of the country, are directly or indirectly supported by the Gulf of Mexico offshore drilling industry. As an example, suppose that the demand for drill pipe falls as a result of the moratorium. That reduction in demand for drill pipe would then reduce the demand for services of supply vessels, which would in turn reduce the demand for diesel fuel

[9] Of this $141 million, we estimate that $40 million will come from the Rig Worker Assistance Fund. The remaining $101 million comes from the firms retaining workers.

[10] We assume workers who remain employed will receive six months of wages. Workers paid out of the Rig Worker Assistance Fund can receive a maximum of $30,000.

and dock workers. Additionally, if the pipe is trucked to Port Fourchon, then the demand for trucking services would also be affected. If this reduced demand results in fewer hours or lower employment, then this can reduce earnings among any of the workers who are involved, from the production of the pipe to its delivery at the final destination. These reduced earnings will then lower consumer spending, which yields another cascade of effects through the production and distribution chain for consumer goods. This one limited example demonstrates that many industries and parts of the country can be impacted by changes in the drilling industry.

We start with a multiplier that is based on empirical evidence of how changes in spending affect the entire economy.[11] There are two factors, however, that make the estimates from a standard full multiplier analysis too large when used to analyze the effects of the drilling moratorium.

The first factor is that the drilling moratorium is a temporary and not a permanent policy change. The results from a standard multiplier analysis assume that the change being analyzed is long lasting. An important reason why a temporary moratorium will have a smaller effect is that firms are likely to be reluctant to lay off workers when they know the suspension is temporary. For instance, as described in the previous section, nearly all of the rig operators and contractors we spoke with stated that they have retained most of their workforce during the moratorium. One might expect that supplier firms may engage in similar behavior. Large firms that have ample access to financial capital will be better able to pay their employees during the moratorium than more financially constrained firms. Large companies with multiple clients will also be more likely to switch workers into temporary work of another sort while waiting for drilling operations to start again. At the same time, small firms with less financial capital will likely experience relatively larger employment losses. This is consistent with anecdotal evidence from small businesses in the Gulf Coast region who have testified about the substantial impact of the moratorium on their business.

A second problem with standard multiplier analysis is that it assumes the policy change being analyzed is the only change occurring, with no other offsetting activities. In the case of the drilling moratorium, it was put in place at the same time that a substantial amount of money was being spent in the Gulf Coast on spill response and cleanup activities. Reduced spending from deepwater drilling may be offset by the increased spill response and cleanup spending. BP has publicly stated that it spent over $8 billion on spill response and cleanup during the first three months of the moratorium.[12] In contrast, we estimate that overall spending on deepwater drilling fell about $1.0 billion during the first three months of the moratorium. Although not all spill response and cleanup dollars may be spent in the Gulf Coast, the impact of the moratorium could have been at least partially offset by this surge in other spending. Additionally, some operators we spoke with suggested they have partially shifted some of their reduced deepwater spending to onshore drilling operations or forward-shifted maintenance and upgrade activities. This spending could also have a similar offsetting effect.

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[11] The multiplier we use is described in more detail in http://www.whitehouse.gov/administration/eop/cea/Estimate-of-Job-Creation/

[12] BP press release, September 3, 2010: http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7064849

In summary, we do not believe that the use of a full multiplier will result in a reasonable estimate of the Gulf Coast employment impact of reduced spending due to the drilling moratorium. Multipliers are designed to measure the impact of a permanent spending shock. In this case, the temporary nature of the moratorium, combined with the increased spending on other activities, means that using a full multiplier will result in an inaccurate and overly large estimate.

We do not know with precision exactly how much smaller the economic effect might be, relative to the standard multiplier. Because of this, we use a range of multipliers, producing a range of possible job impacts. Specifically, we assume that the appropriate multiplier with which to analyze the impact of the deepwater drilling moratorium will be between 40 and 60 percent of the effect estimated by a full multiplier.

For this analysis, we take the estimated reduction in spending from Table 2 ($1.8 billion) and divide by a multiplier that indicates how spending translates into jobs. We use an estimate of dollars per job of $92,136.[13] We adjust these results using the range of 40 to 60 percent. We estimate that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico.[14,15]

Our estimates, like those in earlier studies, assume that normal drilling operations would have taken place in the absence of the moratorium. The "counterfactual" – that is, the comparison against which these moratorium effects are generated – assumes no change in drilling operations from the prior period. In reality, the BP Deepwater Horizon oil spill generated widespread concern about the safety regulations in effect for deepwater drilling in the Gulf region. This concern is likely to have reduced short-term drilling activities even without a moratorium, as rig operators and contractors reviewed their safety procedures and as regulators examined the effectiveness of existing safety regulations and the feasibility of additional requirements.

If the true counterfactual is a world in which Gulf Coast drilling activity was substantially reduced for a period of months following the BP Deepwater Horizon oil spill, then our estimates (and those of all studies) overstate the impact of the moratorium. While the moratorium is likely to have reduced drilling more than might otherwise have occurred, it was not imposed arbitrarily but followed an event that greatly affected the Gulf Coast economy and environment and would have impacted Gulf Coast drilling in any case.

Comparison to other studies. A number of earlier studies have produced estimates of the impact of the deepwater drilling moratorium. Table 3 lists those studies most comparable to our analysis, that is, studies that focus primarily on the employment impacts associated with the decrease in offshore drilling activity as a result of the moratorium.

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[13] See Table 4 of "Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009."

[14] An alternative approach, used in many of the prior studies, would be to use regional input-output multipliers (RIMS II) produced by the Bureau of Economic Analysis. Using the RIMS II approach with multipliers for the Gulf Region and a similar set of assumptions as those used in the analysis presented in the main text, we get nearly identical results, estimating that there may be up to 8,000 to 11,000 fewer jobs.

[15] The estimated impacts are in job-years. In this analysis, like others that have been done for the Gulf Coast, we do not estimate when the impacts will occur.

The projected employment impacts vary greatly across the studies, with estimates from 10,000 to 46,000 jobs lost. These differences stem from differences in a number of assumptions. However, one of the primary reasons why our estimates differ from many of the estimates in Table 3 is that we have updated information not available to these earlier reports. More specifically, we have learned that many of the deepwater drilling rig workers have kept their jobs whereas almost all of the earlier studies assumed that virtually all of these rig workers would have been let go.

Table 3: Comparison of Selected Moratorium Employment Impact Estimates

	Total Jobs Potentially Impacted (in thousands)
Impacts Estimated for State of Louisiana only	
Louisiana State University (Dismukes)	-10 to -16
Louisiana State University (Richardson)	-17
Louisiana Department of Economic Development	-10 to -20
Impacts Estimated for Gulf Coast	
Minerals Management Service	-23
Louisiana State University (Dismukes)	-35
Louisiana Mid-Continent Oil and Gas Association	-30 to -46

Additionally, there are two other differences between this study and those conducted by others, and one of those differences would tend to inflate our employment impacts relative to other studies while the other would reduce our estimates. The aspect which would tend to inflate our estimates is the emphasis we place on the reduction in spending on drilling supplies and services on the offshore rigs, which is sizable. Most of the earlier studies looked only at employment loss and the resulting reduction in wage and salary income. We have estimates that suggest substantial declines in spending on a host of other rig-related activities. The aspect which lowers our estimates is that we adjust our multiplier for the fact that this is a temporary policy change and not a permanent change. Many other studies used full multipliers, which erroneously embed the assumption that these effects are permanent.

7. Estimated Production Impact of the Six-Month Moratorium

So far, we have focused on one of the primary effects of the moratorium, namely, reduced spending on drilling which can impact Gulf Coast employment. The other first order effect of the moratorium is on oil production. The suspension might be expected to delay future oil production in the Gulf of Mexico, by delaying both development and exploration activities. However, these delays are not expected to reduce long-term cumulative oil and gas production on the Gulf Coast, since by itself, the moratorium does not change the size of the estimated oil resource in the Gulf of Mexico.

While near-term Gulf of Mexico deepwater production is expected to be reduced relative to a "no moratorium" baseline projection, cumulative Gulf of Mexico deepwater production over an extended time period is not expected to fall, as increases above the baseline in future years are projected to offset near-term losses. Because production is delayed rather than permanently foregone, the value of near-term production losses is likely to significantly overstate impacts on the present value of cumulative future Gulf of Mexico deepwater production. In fact, depending on the discount rate applied and the patterns of oil prices and Gulf of Mexico oil production over time, the present value of cumulative Gulf of Mexico deepwater production could either increase or decrease relative to its baseline level.

Following the initial suspension of deepwater drilling activities, the Energy Information Administration (EIA) prepared an assessment of the impact of this moratorium on the 2010 and 2011 U.S. crude oil supply. Since the moratorium affected rigs that were involved in both exploration and development activities at various water depths and stages of completion, this estimate was based on a variety of assumptions related to success rate, production rates, and timing. Those assumptions are outlined in the Appendix.

Based on these assumptions, we estimate:

- The reductions in crude oil production resulting from the moratorium will increase from a monthly average of about 10,000 barrels per day (bbl/d) in September 2010 to nearly 100,000 bbl/d by December 2011, averaging about 31,000 bbl/d in the fourth quarter of 2010 and roughly 82,000 bbl/d in 2011.

- The total cumulative reductions in the output of crude oil from the deepwater Gulf of Mexico will be about 3.1 million barrels in 2010 and 30 million barrels in 2011. This represents about 0.2 percent and 1.5 percent of total U.S crude oil production in each of these years.

While published EIA estimates have focused on production impacts in 2010 and 2011 relative to a no-moratorium baseline, the analysis suggests that the production impact directly attributable to the six-month moratorium will peak in 2013 and then slowly decline. This time pattern reflects several competing factors. For example, there is a significant time lag between completing development wells and connecting some of them to the undersea pipeline network, which means that some wells impacted by the moratorium would not have entered production until late 2012 or 2013 under baseline conditions. On the other hand, the flow rate of each individual well typically declines significantly as production occurs, so that the amount of production expected from each moratorium-impacted well generally declines over time. Beyond 2013, the latter effect seems likely to dominate.

To put these production impact estimates into perspective, it is important to keep in mind that there are currently over 4,500 producing wells in the Gulf of Mexico. Although new deepwater wells are generally much more productive than the average of existing wells in the Gulf of Mexico, the moratorium is delaying a relatively small number of new wells. Finally, notwithstanding the impacts of the six-month drilling moratorium on Gulf of Mexico production, EIA continues to expect that total U.S. crude oil production will increase in both 2010 and 2011.

At least two other organizations have made estimates of the impact of the moratoria on deepwater production, resulting in estimates very similar to those made here. A Bureau of Ocean Energy Management, Regulation and Enforcement study (using different assumptions) predicts a cumulative loss of 30.5 million barrels of oil (83,600 bbl/d) in 2011. Wood Mackenzie estimates a 93,000 barrel of oil equivalent per day (boe/d) deferral as a direct effect of the six-month moratorium.

There is little evidence of any price impact due to the moratorium. During the week following the announcement of the moratorium in late May, both West Texas Intermediate (WTI) crude oil spot prices and NYMEX light sweet crude oil futures contract prices fell by about $2 per barrel. WTI crude oil spot prices during May 2010 averaged $73.74 per barrel, and averaged $75.34 per barrel in June, $76.32 per barrel in July, and $76.81 per barrel in August. Spot and futures market price movements following the announcement of the moratorium were primarily attributed to changing economic conditions and changes in expectations of world economic and oil demand growth. The moratorium has not been cited in market reports as a significant driver of oil prices.

Oil is a highly fungible commodity traded on a world market. The projected reduction relative to baseline in Gulf of Mexico deepwater production of 31,000 bbl/d in the 4th quarter of 2010 and an average 82,000 bbl/d in 2011 represent, respectively, 0.04 percent and 0.09 percent of a world demand for oil and other liquid fuels of roughly 87 million bbl/d. Beyond the small size of the reduction relative to the overall market, several factors suggest very limited prospects for a discernible impact on crude oil or product prices due to the six-month drilling moratorium. Notably, both crude oil and petroleum product stocks and global spare crude oil production capacity are currently at very high levels.

8. Conclusions

This report estimates that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico. This employment impact needs to be weighed against the longer term economic benefits from assessing the causes of the recent oil spill and designing and implementing adequate safety provisions, following the economic and environmental disaster that resulted from the explosion of the BP Deepwater Horizon rig in April 2010. The evidence suggests that job impacts among workers in larger companies, particularly the drilling rigs in the Gulf of Mexico, may be relatively limited because these companies have chosen to retain their skilled labor. Most of the potential employment impacts may be in businesses that provide supplies and support to the drilling industry in the Gulf Coast. The data suggest that the magnitude of the spill response and cleanup spending in the Gulf Coast is large enough so that some of these businesses may have been able to replace some of their lost earnings by serving other customers. Importantly, these estimates assume that normal drilling operations would have occurred in the absence of the moratorium; the true effects of the moratorium are likely to be somewhat smaller

given that some short-term drilling slowdown would have been likely following the BP Deepwater Horizon explosion and the increased safety concerns generated by this disaster.

While any job loss due to the moratorium, even temporary, is deeply regrettable, it is important to place these effects in the context of the economic, environmental and safety threat that the BP Deepwater Horizon explosion created. Given uncertainty about the adequacy of existing safety regulations, the moratorium was designed to provide greater certainty that deepwater drilling in the Gulf Coast is being conducted in a safe manner, with effective safeguards and responses in place should problems arise. These safeguards are highly important given the expectation that Gulf Coast oil and gas will continue to provide a significant share of domestic energy production.

APPENDIX

I. Appendix to Section 5: Changes in Rig Employment and Spending as a Result of the Moratorium

Table A1 summarizes the underlying estimates of changes in deepwater rig employment and spending used in this study. This Appendix section explains the components reported in that table.

The first part of the table, labeled "Rig Assumptions," lists the estimates used for the number of rigs, employment per rig, and average spending per rig. The information on the number of working rigs comes from Rig Data, a private company. We assume for the counterfactual scenario (what would have happened in the absence of a moratorium) that the number of working rigs would be the same as the number of working rigs as of April 2010, which was 46. For the actual scenario, we assume the same number of working and non-working rigs in August also applies for September, October, and November. The estimates of workers per rig and spending per rig prior to the moratorium come from the Department of the Interior, and these estimates closely align with those appearing in other studies and reported by industry participants. We further assume that the number of rig workers and daily spending on the rigs affected by the moratorium are higher than the pre-moratorium average for all rigs to allow for the possibility that drillships and semi-submersibles (which are larger and more expensive to operate) are more likely to be affected by the moratorium than platforms. As Table A1 indicates, we assume that an average rig affected by the moratorium employed 233 workers and generated total spending of $643,595 per day prior to the moratorium.

Based on this information, we next compute the six-month total amount of spending and number of rig workers under the counterfactual scenario in which there is no moratorium. These results are under the "No Moratorium (counterfactual)" heading of the table. In the absence of the six-month moratorium, we estimate operator spending on deepwater drilling would have been just under $5 billion during those months (about $800 million per month) and that there would have been about 9,700 rig workers employed on these rigs, which is how many were estimated to be employed in the month prior to the moratorium.

We next compute the average number of rigs that would not be working as a result of the moratorium relative to the counterfactual scenario. Over the six-month period, an average of 15 out of the 46 rigs continued to work during the moratorium and 31, on average, were idled. We also report that an average of four deepwater rigs exited the Gulf of Mexico over the six months of the moratorium (we assume any rigs that left did so as a result of the moratorium). These figures are under the heading, "With Moratorium."

Based on the number of rigs no longer working and those that left the Gulf of Mexico, we also compute the average number of lost rig worker jobs during the six-month moratorium. For this calculation we assume that 50 percent of the rig workers are drilling contractor employees and the other 50 percent are well service company employees (the number of operator employees per rig is typically very small).

- For rigs that remain working in the Gulf of Mexico, we assume no jobs are lost.
- Based on information gathered from industry participants, we assume that for non-working rigs that remain in the Gulf of Mexico, 15 percent of the drilling contractor employees are laid off and 20 percent of the well service employees are laid off or redeployed outside of the Gulf of Mexico region.
- Finally, for any rigs that have departed the Gulf of Mexico, we assume all rig worker jobs are lost. While we have learned that numerous rig workers are likely to keep their jobs by moving with a drilling rig that exits the Gulf of Mexico, we conservatively treat these as job losses because they represent job losses to the Gulf of Mexico region.

In total, we estimate an average of 1,962 rig workers will be laid off or leave the Gulf Coast during the six-month moratorium.

Using the average number of rigs no longer working, those that left the Gulf of Mexico, and our average job loss estimates, we next compute the amount of lost spending.

- We assume that no spending is lost for rigs that remain at work.
- Based on information gathered from industry participants, we assume that spending related to non-working rigs that remain in the Gulf of Mexico is reduced by 47.5 percent. To understand this number it is useful to know something about the cost structure of the rigs. Rig spending is typically divided between "day rates" (the daily charge to lease the drilling rig from the drilling contractor, which includes paying for a number of workers who oversee rig operations) and "spread costs" (the expenses necessary to supply the rig with the additional well service labor and supplies needed to conduct drilling operations). A rule-of-thumb in the industry is that day rates and spread costs each comprise about half of the operator's total expenses incurred in drilling operations. We assume that the day rates are unaffected on idled rigs and that all of the spending reductions during the moratorium come out of the spread costs. Because some workers remain on these rigs and some maintenance work is being done on them, we do not reduce the spread costs to zero, but reduce them by 95 percent. If day rates and spread costs each constitute half of the rig's normal operations spending, a 95 percent reduction in spread costs results in a 47.5 percent reduction in total rig spending on idle rigs.
- We further assume that spending for any rigs that have departed the Gulf of Mexico drops to zero. The latter assumption was made to reflect the idea that even though spending on these rigs continues, that spending has largely left the Gulf of Mexico region.

With these assumptions, we estimate the total gross spending reduction from the 6 month moratorium to be $1.95 billion.

As mentioned in the main body of the report, part of the gross spending reduction calculated above is offset due to the fact that some workers affected by the moratorium may still receive compensation. While the rig operators may no longer be paying these workers, their wages can come from alternative sources. First, we assume that all drilling rig workers who are laid off can receive compensation from the $100 million Rig Worker Assistance Fund, which is designed to cover 100 percent of their lost wages (up to $30,000) in the short run. Second, there are some rig

workers who are no longer hired by the drilling operators but continue to be paid by their employer. For these workers, we assume they will be paid wages averaging $80,000 annually (or $40,000 over six months). The section under the heading "Wage Replacement Offsets" provides more detail on these numbers. Our estimate of the total amount of deepwater drilling spending lost due to the moratorium, is about $1.81 billion, representing the difference between the gross spending reduction (about $1.95 billion) and the offsets (about $141 million) just described.

Table A1

Rig Assumptions	
Average number of working deepwater rigs prior to the moratorium	46
Average number of working deepwater rigs during the moratorium	15
Estimate of average number of rig workers per all deepwater rigs (pre-moratorium)	210
Estimate of average number of rig workers per all deepwater rigs affected by moratorium	233
Estimate of average daily spending per all deepwater rigs (pre-moratorium)	$572,480
Estimate of average daily spending per all deepwater rigs affected by moratorium	$643,595
No Moratorium (counterfactual)	
Total operator spending for deepwater rigs during 6 months in millions (counterfactual)	$4,819
Average number of deepwater rig workers during 6 months (counterfactual)	9,660
With Moratorium	
Average number of non-working deepwater rigs during 6 months (actual)	31
Average number deepwater rigs exited from GOM during 6 months (actual)	4
Average Number of Rig Worker Losses During 6 Months	1,962
Gross Spending Reduction From Moratorium During 6 Months (in millions)	$1,952
Wage Replacement Offsets (in millions)	
Drilling contractor rig workers laid off but compensated by BP fund	$27
Well service rig workers laid off due to rigs exiting GOM, but compensated by BP fund	$13
Well service rig workers still employed	$101
Total Spending Reduction Including Wage Replacement Offsets During 6 Months (in millions)	$1,811

II. Appendix to Section 7: Estimated Production Impact of the Six-Month Moratorium

The EIA impact analysis made the following assumptions in order to estimate the short-term production loss due to the moratorium:

- Thirty-four development wells would not get drilled during the six-month moratorium. This estimate reflects the number of rigs affected by the moratorium, the time period typically required to drill a well, and the split between exploration and development drilling.
- The 34 development wells were assumed to have been drilled at a rate of six per month for the first four months and then five per month for the last two months.
- Six wells would have begun producing by the end of November 2010. This estimate reflects the fact that the amount of time required to connect development wells to the undersea pipeline network varies, with a considerable lag before some wells are connected.
- The weighted average initial production rate from the wells not drilled would have been 5,300 bbl/d.
- Operators would be able to obtain the necessary equipment and permits to restart drilling operations immediately following the lifting of the moratoria.
- Following the lifting of the moratorium, Gulf of Mexico drilling activity would resume at the prevailing pace prior to its imposition. However, all future planned development wells would also be delayed by six months.
- No impact of new legislation, regulatory requirements or other permitting delays on future drilling in the Gulf of Mexico. Such changes could have a much larger long term impact than the moratorium, and could affect potentially drilling activity and production levels in all depths of water.
- No potential impact of the hurricane season or actions other than the moratorium in response to the BP Deepwater Horizon oil spill. It is likely that some Gulf of Mexico drilling activities could have been delayed by these factors.
- No impact of the movement of drilling rigs from the Gulf of Mexico. There were initial concerns that there could be an exodus of deepwater drilling rigs to other parts of the world and that operators would utilize force majeure provisions to cancel existing contracts. The EIA estimate assumed that current drilling activity would resume at the prevailing pace prior to the imposition of the moratorium after it is lifted.

Alaska

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Salazar: Arctic oil drilling must wait

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ANCHORAGE, Alaska, Sept. 4 (UPI) -- U.S. Interior Secretary Ken Salazar says exploratory drilling for oil and gas in offshore arctic waters must wait until more is known about potential pitfalls.

On a trip to Alaska's North Slope, Salazar said final reports on the causes of the Deepwater Horizon blowout and spill in the Gulf of Mexico must be completed before Shell Alaska would be allowed to start drilling in the Beaufort and Chukchi seas off Alaska's northern shores, the Los Angeles Times reported Saturday.

"If you look at the Chukchi, nothing, or very little, is known about the reservoir pressures that will be encountered," Salazar said at the end of his Alaska trip.

"We know that it would be very difficult to mount the kind of oil spill response that has been mounted in the Gulf of Mexico," he said.

"And so because those questions are very much part of what we have been dealing with, it also seemed necessary for us to say, until we have answers to some of those central questions, we're not going to allow the drilling of the exploration wells," Salazar concluded.

A recent survey found support for offshore drilling in the arctic slipping, down to 46 percent from a 2009 result of 58 percent who supported new offshore operations, the Times said.

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Bloomberg

Alaska Claims in Suit U.S. Government Improperly Banned Off-Coast Drilling

By Margaret Cronin Fisk - Sep 10, 2010

U.S. Interior Secretary Kenneth Salazar was sued by the state of Alaska over claims he improperly banned drilling off the state's coast after BP Plc's Gulf of Mexico oil spill.

The U.S. hasn't issued drilling permits in the Arctic since the sinking of the Deepwater Horizon rig in the Gulf in April and Salazar announced at a press conference this month that he wouldn't allow exploration plans to resume this year, according to the complaint filed yesterday by Alaska and its Republican governor, Sean Parnell.

The U.S. in May imposed a moratorium on deep-water drilling in the wake of the Gulf spill. Regulators including Salazar have improperly stopped drilling as well in the shallower waters off Alaska's coast without issuing a formal ban, the state said.

"Defendants have not issued a final, appealable decision on a moratorium for the Alaska region," the state said in the complaint filed in federal court in Anchorage. "Nor have defendants issued any findings, analysis, or explanation to support such a moratorium."

The lawsuit claims that Salazar and the Interior Department didn't consult the state or give it a chance to participate in the moratorium decision, as legally required. The state asked the fcourt to order the U.S. to end any moratorium on drilling in the Alaska region.

The state also sued the Interior Department, the Bureau of Ocean Energy Management, Regulation and Enforcement and its director, Michael Bromwich.

'No Moratorium'

"There is no moratorium in Alaska and therefore nothing to sue on," Kendra Barkoff, an Interior Department spokeswoman, said in an e-mail yesterday. "The moratorium is on deep-water drilling and there is no deep-water drilling in Alaska."

U.S. regulators are "taking a cautious approach to offshore oil and gas development," she said. "We need additional information about spill risks and spill response capabilities, which is why Secretary

Salazar has delayed Shell's request to drill in the Beaufort and Chukchi seas and canceled the remaining four lease sales in the Arctic."

The case is State of Alaska v. Salazar, 3:10-cv-00205, U.S. District Court, District of Alaska (Anchorage).

To contact the reporter on this story: Margaret Cronin Fisk in Southfield, Michigan, at mcfisk@bloomberg.net.

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National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

THE CHALLENGES OF OIL SPILL RESPONSE IN THE ARCTIC

--Draft--

Staff Working Paper No. 6[1]

This draft staff working paper describes some of the difficulties of spill response in the Arctic. In the staff's view, response challenges in the Arctic are important for the Commission to consider in its recommendations for the future of offshore drilling. This paper provides background information regarding the status of offshore drilling in Arctic waters, identifies problems with responding to oil spills in Arctic waters, and highlights areas for further Commission inquiry with respect to Arctic drilling. The last panel of the response hearing on September 27, 2010 will focus on Arctic issues. The panel will feature Pete Slaiby, Vice President of Shell Alaska; Captain John Caplis, Chief of the United States Coast Guard Office of Incident Management and Preparedness; Edward Itta, Mayor of the North Slope Borough; and Dennis Takahasi-Kelso, Executive Vice President of the Ocean Conservancy. This paper suggests questions that Commissioners may want to ask during the hearing.

I. Background

A. The Region at Issue

The two locations of offshore drilling in the Arctic, the Beaufort Sea and the Chukchi Sea, present different drilling conditions and response issues.

The Beaufort Sea drilling sites are situated on man-made gravel islands located two to fifteen miles offshore, in water depths up to approximately 100 feet.[2] They are often linked to onshore facilities and are close to land and shoreline resources. The majority of the construction

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[1] Staff Working Papers are written by the staff of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling for the use of members of the Commission. They are preliminary and do not necessarily reflect the views of the Commission or any of its members. In addition, they may be based in part on confidential interviews with government and non-government personnel.

This working paper does not address all issues related to Arctic drilling in which the Commission may be interested. For example, the paper does not address the evaluation of spill impacts, the potential non-oil spill impacts of oil and gas development in the Arctic, or the role of environmental regulatory review under the National Environmental Policy Act, the Marine Mammal Protection Act, and other federal laws (or their Alaska state counterparts).

[2] BP IN ALASKA, www.bp.com/assets/bp_internet/us/bp_us_english/STAGING/local_assets/downloads/a/A02_alaska_facts_figures.pdf (last visited Sept. 15, 2010); SHELL'S BEAUFORT SEA EXPLORATORY DRILLING PROGRAM: OIL SPILL PREVENTION AND RESPONSE, http://www-static.shell.com/static/usa/downloads/about_shell/strategy/major_projects/alaska/final_shell_ospr_booklet_10-1-07.pdf (last visited Sept. 18, 2010); Ian Urbina, *BP Is Pursuing Alaska Drilling Some Call Risky*, N.Y. TIMES (June 23, 2010).

of the offshore gravel islands, however, needs to be completed during the winter ice season when an ice road exists between the site and the mainland.[3]

The locations of drilling interest in the Chukchi Sea are much further offshore and, consequently, much less accessible. This area had until recently generated less interest from industry as a result of its lack of shoreline infrastructure and the consequent heightened cost of drilling.[4] The current applications from the Shell Oil Company and StatOil are for seismic exploration and exploratory drilling at least sixty miles off the coast that would take place during the open water season from July to October.[5]

These differences in environmental conditions and drilling proposals mean that spill response in the Beaufort Sea would potentially be more straightforward than spill response in the Chukchi. The Beaufort region has more developed and proximate infrastructure, so access to a spill area might be easier. However, the Beaufort drilling sites are closer to both the sensitive shoreline and the areas traversed by bowhead whales and whale hunters.

A spill or blowout in the Chukchi Sea area would be more difficult to access, let alone contain and clean up. Although Shell has pre-positioned assets dedicated to potential spill response in the Chukchi Sea,[6] bringing any assets, both the pre-staged equipment and any additional resources brought from elsewhere, to bear on a spill in the Arctic would be more difficult than in the Gulf of Mexico. And once the winter freeze occurs, any spill would be impossible to access for purposes of response. On the other hand, any spill in the Chukchi Sea would be far from coastal resources, and oil trapped beneath sea ice would be unlikely to spread into marine ecosystems until the ice began to melt.

The Arctic areas also stand in contrast with the Gulf of Mexico in terms of the issues posed by deepwater drilling. The Deepwater Horizon containment efforts were complicated immensely by the depth of the wellhead and the high well pressures encountered at the Macondo well. Wells in both the Chukchi and the Beaufort Seas would be in far shallower water, which could make it easier to contain a blowout or riser leak. Shell asserts that well pressures in the Chukchi and Beaufort Seas would be approximately one third to one half of the pressures faced by BP at the Macondo well.[7] Finally, although wells in the Chukchi would be similar to the

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[3] J.D. Hall, *Oooguruk Project Offshore Alaska*, OFFSHORE (Aug. 1, 2008), http://www.offshore-mag.com/index/article-display/337896/articles/offshore/volume-68/issue-8/arctic-frontiers/oooguruk-project-offshore-alaska.html.

[4] CHARLES THOMAS, WALTER NORTH, TOM DOUGHTY & DAVID HITE, ALASKA NORTH SLOPE OIL AND GAS: A PROMISING FUTURE OR AN AREA IN DECLINE?, DOE/NETL (Apr. 8, 2009), http://www.netl.doe.gov/technologies/oil-gas/publications/AEO/ANS_Potential.pdf [hereinafter THOMAS ET AL., ALASKA NORTH SLOPE OIL AND GAS].

[5] Online Public Notice, State of Alaska, North Slope Borough: Shell Offshore Inc. 2010 Chukchi Sea Exploration Plan (Nov. 25, 2009), http://notes4.state.ak.us/pn/pubnotic.nsf/PNByPublActive/863634D1F5F772408925767800061 5E2?OpenDocument (last visited Sept. 15, 2010).

[6] Peter K. Velez, Upstream Emergency Response Manager, Shell International Exploration and Production B.V., Presentation to Commission staff (Sept. 16, 2010).

[7] The Macondo wellhead lay below about 5,000 feet of water; the proposed exploratory wells in the Chukchi Sea would be at depth of about 150 feet. Shell believes, based on the testing it has already done, that the pressures in the Chukchi Sea would be two to three times less than they were in the Macondo well. Letter from Marvin E. Odum, President, Shell Oil Company to S. Elizabeth Birnbaum, Minerals Management Service (May 14, 2010), *available at* http://www.thearcticsounder.com/article/1020shell_letter_defends_arctic_program_in_light.

Macondo well in terms of distance from shore, the human uses of the shoreline of the Gulf Coast are much more expansive than the human uses of the North Slope Coast.[8]

The contrasts between these regions and between open water and ice conditions affect the nature of spill response and spill response planning. Many of the issues highlighted in this paper apply to both the Beaufort and the Chukchi Seas, but the different conditions should be kept in mind.

B. Industry Interest

Although interest in exploring Alaska's North Slope for oil began in the early 20th century, the region's remoteness and lack of land availability prevented serious private investment, leaving most exploration to the U.S. Navy. It was the discovery of the Prudhoe Bay and Kuparuk River fields from 1967-69 that spurred the industry to explore the Arctic region of Alaska.[9] In 1979, the government conducted a leasing sale that included state and federal waters of the Beaufort Sea, resulting in the first major venture into Arctic offshore exploration.[10]

Drilling in the Beaufort began in 1981, with a total of 20 wells drilled by 1989. Only a few of the wells were further developed, including those in the Northstar and Liberty fields. Most of the wells drilled in the Beaufort came up dry. Among the dry wells were those in the Mukluk field, which, at a cost of $120 million, are considered the most expensive dry wells ever drilled.[11] In the Chukchi, remoteness and harsh conditions continued to discourage industry activity. The first lease sale in the area was not held until 1988.

In the 1990s, industry's interest decreased in both the Chukchi and the Beaufort, in part because of the failure of Mukluk. But more recently, interest—in particular, by Shell—has begun to grow once again. Several factors have contributed to renewed oil industry interest in drilling in the Beaufort and Chukchi Seas. Improved technology has made remote locations more economically viable to explore. Additionally, the then-Minerals Management Service (MMS)[12] issued new information for the Burger field in the Chukchi Sea in advance of the lease sales held in 2008, which detailed significant untapped oil and gas resources and made the region much more attractive for exploration and investment.[13] The U.S. Geology Survey, also in 2008, released a reevaluation of Arctic potential resources, estimating that "90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids may remain to be found in the Arctic, of which approximately 84 percent is expected to occur in offshore areas."[14]

Shell estimates that there are 25 billion barrels of oil in the Alaskan Arctic, with the majority in the Chukchi Sea; the data from BOEMRE, which accounts only for oil that is economically recoverable with current technology, is 0.15 to 12 billion barrels of oil in the

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[8] Some of the shoreline and human use issues of Gulf of Mexico and the Chukchi and Beaufort Seas will be discussed in later Commission work on the potential impacts of a spill.

[9] THOMAS ET AL., ALASKA NORTH SLOPE OIL AND GAS, at 2-17 to 2-25.

[10] *Id.* at 2-26.

[11] *Id.* at 2-35.

[12] MMS is now the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE).

[13] THOMAS ET AL., ALASKA NORTH SLOPE OIL AND GAS at 2-79.

[14] Fact Sheet, U.S. Geological Survey, Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle (2008), *available at* http://pubs.usgs.gov/fs/2008/3049/.

Chukchi.[15] Shell acquired leases in the Beaufort during Lease Sale 195 in 2005 and in the Chukchi during Lease Sale 193 in 2008, and it has announced plans to drill in both regions. Shell's proposal for drilling exploratory wells in the Chukchi Sea envisions operations taking place from approximately July 15 to October 30. Drilling will occur from a floating drillship. If Shell begins production at some time in the future, production drilling will occur year-round, though access to the drilling operations by boat will be easier during open water season.

The shrinking Arctic ice cap is also a factor. A smaller ice cap creates longer open water seasons and increased open water areas, while diminishing risk of ice collisions.[16] The Arctic Ocean is subject to regular freezing and melting as the ice shelf that extends off the main Arctic ice cap expands in the winter and retreats in the warmer summer months. The ice seasons consist of: "open water" in the summer, "freeze up" as the ice forms through the fall, "over winter" as the solid floating ice attaches to the shelf, and "break up" as the ice melts and cracks into floes and other large pieces through the spring. As the temperatures in the Arctic increase, both the extent of ice cover overall and the length of time that ice blocks the sea decreases. Estimates vary as to how soon the Arctic Ocean will be ice-free in the summer months, but most projections place the event sometime between 2030 and 2100.[17]

C. Status of Exploration and Leasing

The Beaufort and Chukchi Seas sit in different positions with regard to where, how, and when exploration and drilling may occur. All drilling in the Arctic is on pause as of this writing. On September 3, 2010, during a trip to Alaska, Department of Interior Secretary Ken Salazar announced that the Department of the Interior will not decide whether to allow exploratory drilling for oil and gas in the Alaska Arctic outer continental shelf until the Department has completed a review of issues relating to offshore drilling activities.[18] On September 9, 2010, the state of Alaska sued the Department of the Interior in the United States District Court for the District of Alaska, contending that the announcement imposed an improper de facto moratorium and did not give the state a chance to comment or a final decision to appeal.[19] An Interior spokesperson indicated that the Department was "taking a cautious approach" and needed "additional information about spill risks and spill response capabilities."[20] The Department also

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[15] Shell Beaufort and Chukchi Sea, Program Update, Presentation to National Commission Staff, in Washington D.C. (Sept. 17, 2010); Questions and Answers: The Next Five-Year OCS Oil and Gas Leasing Program (2012-2017), http://www.doi.gov/whatwedo/energy/ocs/QA_2012-2-17.cfm.

[16] RONALD O'ROURKE, CONG. RESEARCH SERV., CHANGES IN THE ARCTIC: BACKGROUND AND ISSUES FOR CONGRESS 17 (Mar. 30, 2010).

[17] *See, e.g.*, Press Release, National Snow and Ice Data Center, Arctic Sea Ice Shatters All Previous Record Lows (Oct. 1, 2007), *available at* http://nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease.html (predicting 2030); Walter Meier, Julienne Stroeve, and Florence Fetterer, *Whither Arctic sea ice? A clear signal of decline regionally, seasonally and extending beyond the satellite record*, 46 ANNALS OF GLACIOLOGY 433 (2007): (predicting 2035-2106); Julienne Stroeve, Marika Holland, Walt Meier, Ted Scambos, and Mark Serreze, *Arctic Sea Ice Decline: Faster than Forecast*, 34 GEOPHYSICAL RESEARCH LETTERS 5 L09501 (2007) (predicting 2050-2100).

[18] Kim Murphy, *Salazar says Arctic Drilling Must Wait Until More is Known About Potential Pitfalls*, LOS ANGELES TIMES (Sept. 4, 2010), http://articles.latimes.com/2010/sep/04/news/la-artic-drilling-greenspace-sept4-m.

[19] Alaska v. Salazar, No. 3:10-cv-00205 (D. Alaska filed Sept. 9, 2010).

[20] Margaret Cronin Fisk, *Alaska Claims in Suit U.S. Government Improperly Banned Off-Coast Drilling*, BLOOMBERG (Sept. 10, 2010), http://www.bloomberg.com/news/2010-09-09/u-s-improperly-banned-drilling-off-alaska-coast-state-alleges-in-lawsuit.html.

contends that there is no moratorium in place for Alaska, but rather a period of additional review of proposed drilling plans.[21]

a. Beaufort Sea

Pioneer Natural Resources, Eni Petroleum, Shell, and BP all have interests in the Beaufort Sea. All offshore fields in the Beaufort Sea are either fully or partially based on artificial offshore islands.

Pioneer Natural Resources was the first independent company to control a producing field in the Beaufort Sea. It has been extracting oil in the Oooguruk offshore field since 2008 in partnership with Eni. The site is located on an artificial gravel island five miles offshore in four-and-a-half feet of water.[22] Italy's Eni has gradually relinquished some of its onshore leases and has instead focused on developing its near-shore Nikaitchuq field in the Beaufort Sea. Eni plans initially to produce oil through an onshore base and later to construct an offshore island and continue production from the water. The company has also teamed up with Shell to conduct seismic tests in the Harrison Bay area of the Beaufort.[23]

BP operates three offshore fields in the Beaufort Sea: Northstar, Endicott, and Liberty. All of them are constructed on man-made gravel islands in the Beaufort Sea waters. The first two fields are older operations, while Liberty was set to begin operating this summer. Liberty is of particular note because it is an ultra-extended reach well: although it will be drilled in fairly shallow water within three miles from shore on state submerged lands, the well will extend laterally for up to eight miles from the surface location of the drilling rig.[24] In light of the Gulf of Mexico oil spill, federal regulators have decided to review BP's plans before allowing BP final permission to drill at Liberty.[25]

MMS proposed additional lease sales in the Beaufort Sea in its 2010-2015 draft proposed five-year leasing program.[26] The National Oceanic and Atmospheric Administration (NOAA) commented on this plan, raising issues related to the impacts of off shore oil exploration and development on living marine resources and their habitats. It also conveyed its concern about the lack of oil spill response preparedness in the Arctic and encouraged leasing to be delayed pending additional research.[27] President Obama's March 31, 2010 announcement of a new outer-continental shelf policy cancelled planned some leases under the 2007-2012 leasing plan and delayed implementation of the proposed 2010-2015 plan to 2012-2017. The 2012-2017 plan is in its early stages of development, and will evaluate whether or not to lease areas in the

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[21] Dan Joling, *Alaska rips feds over suspension of Arctic drilling*, ANCHORAGE DAILY NEWS (Sept. 10, 2010).
[22] Hall, *Oooguruk Project Offshore Alaska.*
[23] Alan Bailey, *More leases Dropped*, 15 PETROLEUM NEWS (Aug. 15, 2010), http://www.petroleumnews.com/pntruncate/109175427.shtml.
[24] Letter from Sean Parnell, Governor of Alaska, to Michael Bromwich, Director, Bureau of Ocean Energy Management, Regulation, and Enforcement 5 (Aug. 25, 2010), *available at* http://gov.alaska.gov/parnell_media/documents/govltrtoBromwich.pdf.
[25] Jim Efstathiou Jr., *BP's Liberty Oil Well in Alaska to Face New Safety Rules*, BLOOMBERG, June 24, 2010, http://www.businessweek.com/news/2010-06-24/bp-s-liberty-oil-well-in-alaska-to-face-new-safety-rules.html.
[26] MMS, Draft Proposed Outer Continental Shelf (OCS) Oil and Gas Leasing Program 2010-2015 (January 2009) [hereinafter MMS 2009 Proposal] (on file with Commission).
[27] Letter from Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere, to S. Elizabeth Birnbaum, Director, Minerals Management Service 5-12 (Sept. 21, 2009) [hereinafter NOAA 2009 Comments] (detailing NOAA's comments on the U.S. Department of the Interior/Minerals Management Service Draft Proposed Outer Continental Shelf Oil and Gas Leasing program for 2010-2015) (on file with Commission).

Beaufort and the Chukchi Seas. Public meetings to determine the scope of the environmental impact statement and the areas to be considered in the five-year leasing program were scheduled for summer 2010, but were cancelled in light of the Deepwater Horizon spill.[28]

b. Chukchi Sea

The 2008 sale of Lease Area 193 in this region proved to be the most profitable in the history of Alaska offshore leasing. Companies bid a total of $2.6 billion for the available lease areas. Lease Sale 193 encompasses approximately 29.4 million acres of the Outer Continental Shelf in the Chukchi Sea. In 2008 seven companies bid for leases: ConocoPhillips, Shell Gulf of Mexico, StatoilHydro USA E&P, the Northern America Civil Recovery Arbitrage Corp, Repsol E&P USA, Eni Petroleum, and Iona Energy Company.[29]

Shell is the only company that has presented plans to drill in the Chukchi (after conducting seismic studies there in 2006 and 2007). It received preliminary permits to drill up to three wells during the summer of 2010. A coalition of Alaska Native and environmental groups challenged the adequacy of the environmental review of the lease sale, contending that the Final Environmental Impact Statement had not fully examined impacts on the environment and human communities. On July 21, 2010, the Federal District Court for the District of Alaska agreed, enjoined all activity under Lease Sale 193, and remanded to the BOEMRE to conduct a more thorough environmental impact analysis.[30] On August 2, 2010, the court amended its ruling and allowed non-drilling activities to continue, granting Shell and Statoil permission to conduct seismic tests in the Chukchi Sea during the remainder of the 2010 summer.[31]

Shell spent $2.1 billion for its 275 lease blocks in the Chukchi in 2008.[32] A leaseholder can have a tract for up to ten years but then must have a development plan in place or the Secretary of the Interior will cancel the non-producing lease.[33] Shell has used up three of those years on its Chukchi sites. Even if the exploratory drilling occurs in the Chukchi and is successful, Shell predicts that another ten to fifteen years would pass before production began.[34]

As with the Beaufort Sea, NOAA's comments on recent proposed lease sales in the Chukchi expressed the view that no leasing should occur in the Chukchi Sea without additional research on oil spill response.[35]

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[28] BOEMRE, Introduction—5-Year Program, http://www.boemre.gov/5-year/ (last visited Sept 17, 2010).
[29] Kristen Nelson, *Chukchi High Five*, 13 PETROLEUM NEWS (Feb. 10, 2008), http://www.petroleumnews.com/pntruncate/347813743.shtml.
[30] Native Village of Point Hope v. Salazar, 2010 WL 2943120 (D. Alaska July 21, 2010).
[31] Yereth Rosen, *Shell, Statoil get OK to do Chukchi Oil Surveys*, REUTERS (Aug. 6, 2010), http://uk.reuters.com/article/idUKN0620571620100806.
[32] Nelson, *Petroleum High Five.*
[33] 43 U.S.C. §§ 1334(c), 1337(b)(2).
[34] Shell Presentation to National Commission.
[35] NOAA 2009 Comments, at 5.

D. Overview of Applicable Regulatory Requirements Related to Spill Response[36]

a. BOEMRE and Alaska Regulations

BOEMRE and Alaska Department of Conservation regulations require an applicant for a permit to conduct offshore exploration or production to provide information regarding its response capabilities. BOEMRE requires an emergency response action plan, which identifies, among other things, a spill management team, a planned location for a spill-response operations center, and an identification of procedures to be followed in the event of a spill.[37] The plan must also include a worst-case discharge appendix.[38] In addition to information about the potential volume, trajectory, and impacted areas in a worst-case discharge spill, the appendix must include a discussion of the potential response to the worst-case discharge scenario in adverse weather conditions. This discussion requires a description of the response equipment; its type, location, and quantity; the amount of time to move the equipment to the spill; and capability, including effective daily recovery capacity. Adverse weather conditions are defined elsewhere in the regulations and "include, but are not limited to: Fog, inhospitable water and air temperatures, wind, sea ice, current, and sea states."[39]

Alaska regulators may additionally require an applicant for a permit for an exploration or production facility to "account for variations in seasonal conditions" and "provide response scenarios for a discharge of the applicable response planning standard volume under typical summer environmental conditions and typical winter environmental conditions."[40] Alaska regulations also specify how much response equipment, including boom, skimmers, and personnel, must be carried, while noting that these are minimum planning requirements, not what may be actually required to respond to a spill.

In the wake of the Deepwater Horizon disaster, Alaska is conducting an analysis of the state regulations regarding offshore drilling. Additionally, the Alaska Oil and Gas Conservation Commission[41] has put together a commission to review offshore drilling practices and ultra-extended reach wells.[42] The Commission put out a public notice on June 24, 2010, seeking public comment on the current requirements regarding well blowout prevention and well control and their possible expansion, including whether the Commission should require "operators

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[36] This section is a general introduction to spill planning in Alaska and is not meant as a comprehensive evaluation of planning requirements. Commission staff intends to provide further evaluation of spill planning requirements in general, and in the Arctic in specific, in a later working paper.

[37] 30 C.F.R. § 254.23.

[38] 33 C.F.R. § 254.21 (requiring an emergency response plan with appendices); 33 C.F.R. § 254.2 (setting out requirements for the worst-case discharge appendix).

[39] 30 C.F.R. § 254.6.

[40] ALASKA ADMIN. CODE tit. 18 § 75.425(e)(1)(I).

[41] The Alaska Oil and Gas Conservation Commission (AOGCC) was formerly a part of the Department of Natural Resources, but is now a quasi-judicial agency within the executive branch. *See* Letter from Parnell to Bromwich (urging BOEMRE to lift the moratorium on offshore drilling in Alaska waters).

[42] The review team is made up of the AOGCC's petroleum engineer commissioner, a petroleum engineer; the chairman of the AOGCC, a geologist; and a public appointee with oil and gas experience. That Commission will also hold hearings after this Commission releases its report. "At this hearing, public testimony will be received and the Commission will examine relevant issues in light of the findings and conclusions of the National Commission." *See* Order by Daniel T. Seamount, Jr., Chair, Alaska Oil and Gas Conservation Commission, Notice of Inquiry by the State of Alaska (June 24, 2010), *available at* http://doa.alaska.gov/ogc/hear/OTH-10-16.pdf (indicating that a public hearing on the review will be noticed thirty days after this Commission issues its report).

drilling offshore or ultra-extended reach wells to demonstrate the ready capability to drill a relief well if necessary."[43] The review is focused on source control and does not appear to be investigating spill response issues. The Division of Oil and Gas, within the Department of Natural Resources, is evaluating its own rules and requirements to determine whether the existing authorities regulating petroleum are sufficient. That study may be completed as early as this September.[44]

b. Shell's Chukchi Regional Exploration Discharge Prevention and Contingency Plan

A review of Shell's Chukchi Regional Exploration Oil Discharge Prevention and Contingency Plan ("Shell C-Plan") illustrates some of the current requirements and the level of detail provided to meet them. Shell is the only company to have made a proposal for drilling in the Chukchi, so there are unfortunately no competing plans with which to compare the response plans Shell proposes. This paper's brief discussion of Shell's proposal is not meant to be comprehensive.

Because Shell's proposal is for exploratory drilling, rather than production, it is subject to different requirements than those for producing wells.[45] BOEMRE regulations require an exploratory drilling operation to calculate a worse-case discharge scenario lasting thirty days, and to provide a response plan for that scenario.[46] The worst-case discharge is the daily volume possible from an uncontrolled blowout.[47] The state regulations require an exploration facility to plan for a release of 16,500 barrels, and an additional 5,500 barrels for each of twelve days past seventy-two hours in the case of a blowout.[48] Shell's final C-Plan includes response plans for a discharge of 5,500 barrels for thirty days, for a total release of 165,000 barrels.[49]

With regard to risks from loss of well control, Shell believes that "a prudent operator can conduct a Chukchi Sea drilling program using a single drillship," which would "relocate to a safe location to initiate a relief well" in the event of a blowout.[50] Shell estimates that it could drill a relief well in as few as sixteen days or as many as thirty-four days. Shell's preferred method for containing a blowout is the use of dynamic surface control measures.[51] The plan, which Shell indicates is accepted as best available technology, is to pump fluid down the well casing and circulate the fluid at a sufficient rate to create friction, which will match or exceed the reservoir pressure and stop the flow.[52] Shell states that it would likely not be able to use a well-capping technique because of the nature of the well. It notes that "[w]ell capping is not feasible for offshore wells from moored vessels with [the blowout preventer] sitting below the

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[43] *Id.*
[44] Tim Bradner, *Alaska's Oil Regulators Work to Ensure the Industry is Responsible*, ALASKA J. COMMERCE (July 16, 2010), http://www.alaskajournal.com/stories/071610/oil_ao.shtml.
[45] The Macondo well was similarly in the exploratory drilling phase.
[46] 30 C.F.R. § 254.26(d).
[47] 30 C.F.R. § 254.47(b).
[48] ALASKA ADMIN. CODE tit. 18 § 75.434.
[49] SHELL, CHUKCHI SEA REGIONAL EXPLORATION OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN (Mar. 2010), *available at* http://alaska.boemre.gov/fo/ODPCPs/Shell%20Chukchi%20C-Plan%20March%202010%20Final%2005-19-10.pdf [hereinafter SHELL C-PLAN].
[50] *Id.* at 1-23
[51] *Id.* at 4-3.
[52] *Id.*

mudline."[53] Because of this limitation, the C-Plan asserts that Shell would immediately mobilize to drill a relief well in the event of a blowout.

Additionally, Shell has proposed a containment system similar to that built to control the Macondo well. It plans to build a containment dome and containment recovery system that would be stored at a port in Alaska and could be deployed in the event of a subsea spill.[54]

The Shell C-Plan notes that, in addition to the Shell-operated response equipment and response teams, Alaska Clean Seas would be used as the primary contractor. Alaska Clean Seas is a non-profit oil spill response operator whose members are companies exploring or drilling on the North Slope or on the Outer Continental Shelf.[55] (A similar organization, the Marine Spill Response Corporation, exists for the Gulf of Mexico.) The Arctic Slope Regional Corporation also runs an additional oil spill response company. In the event of a blowout, Shell proposes to call on Wild Well Control, Inc., a well-control specialist.[56]

Shell notes that recovery of the spilled oil would be limited by the presence of ice, and the plan anticipates that during freeze-up conditions, some oil would become encapsulated by the ice. Shell states that it would monitor and track such oil, and that "response strategies and specific tactics will be modified to accommodate the challenges of working with a variety of potential ice conditions."[57] Within the context of each response strategy discussed in the plan, Shell acknowledges some of the limitations that the presence of ice creates. As discussed in greater depth below, it is likely that non-mechanical response strategies such as in situ burning would play a large role in any response.

MMS conditionally approved Shell's exploration plan (as distinguished from the C-plan) on December 7, 2009.[58] MMS found that Shell's plans for "responding to a blowout, loss or disablement to the drilling unit, or loss of or damage to support craft," complied with a regulation specific to Alaska offshore projects requiring emergency plans, and included, as required, accompanying procedures for critical operations and curtailment.[59] However, MMS required that Shell "provide documentation on the availability of suitable alternative drilling unit(s) that would be made available to Shell should it be necessary to drill a relief well."[60] Shell identified an additional drillship that could be mobilized to begin drilling a relief well, the Kulluk drilling unit, likely to be stored at Dutch Harbor in the Aleutian Islands in southwest Alaska.[61]

Shell's initial C-Plan was submitted in May 2009.[62] MMS gave its conditional approval on December 18, 2009.[63] Both MMS and Alaska regulators required Shell to submit additional

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[53] *Id.*
[54] Shell, Presentation to Commission staff, in Washington D.C. (Sept. 16, 2010).
[55] ALASKA CLEAN SEAS, www.alaskacleanseas.org.
[56] SHELL C-PLAN at 1-22.
[57] *Id.* at 1-26.
[58] Letter from Jeffrey Walker, Regional Supervisor, Field Operations, MMS, to Susan Childs, Shell Offshore Inc. (Dec. 7, 2009), *available at* http://alaska.boemre.gov/ref/ProjectHistory/2009_Chukchi_Shell/2009_1207.pdf [hereinafter EP Letter] (conditionally approving Shell's 2010 exploration drilling program and noting that response to the contingency plan would follow separately).
[59] 30 C.F.R. § 250.220.
[60] EP Letter at 3.
[61] Shell, Presentation to Commission Staff, in Washington D.C. (Sept. 16, 2010).
[62] SHELL, CHUKCHI SEA REGIONAL EXPLORATION OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN (May 2009), *available at* http://alaska.boemre.gov/ref/ProjectHistory/2009_Chukchi_Shell/2009_0623_Shell_cplan.pdf.
[63] Letter from Jeffrey Walker, Field Operations, MMS, to Susan Childs, Shell Offshore Inc. (Dec. 18, 2009), *available at* http://alaska.boemre.gov/ref/ProjectHistory/2009_Chukchi_Shell/2009_1218_childs.pdf (conditionally approving the Shell C-Plan).

information on several response issues, such as where response equipment would be pre-staged, the estimated mobilization times for spill response equipment, a copy of its contract with oil spill response operators for dispersant support, and the length of time it would take ACS to transport response support from Prudhoe Bay to the Chukchi sites.[64] MMS also required Shell to conduct contingency plan exercises, including a tabletop drill addressing the worst-case discharge scenario, and deployment exercises demonstrating the capacity to carry out the response activities described in the plan. Shell submitted a revised plan in March 2010.[65]

On April 6, 2010, MMS gave final unconditional approval of the Shell C-Plan, finding that the requested information had been provided. In a news interview after the Deepwater Horizon spill, BOEMRE spokesperson John Callahan said, "The Alaska Region [of BOEMRE] can confirm that it reviewed Shell's contingency plan and found it adequate for the time it was issued. However, in light of the BP oil spill in the Gulf and new requirements for the plans, we will be reviewing the adequacy of the current version of the project's spill plan."[66]

II. Challenges of Spill Response

The Arctic environment poses unique challenges for spill response. Some limitations of existing techniques are discussed below. To the extent the Shell C-Plan seeks to address these issues, Shell's proposed method of adapting to the limitations is described.

A. Adverse Weather

The presence or absence of ice is a large factor in the ability to respond to a spill, but it is not the only environmental factor affecting spill response. Temperature affects the consistency of oil and the speed at which it degrades. Winds and the resulting wave action are another factor. High energy from wind and waves can help oil to disperse naturally, but this energy also breaks up a thick slick into multiple thinner slicks, which are more difficult to address. Also, in broken ice, waves are less effective at naturally dispersing oil.[67]

Weather, including wind and wave activity, also affects responder access to an oiled area and whether recovery strategies such as boom and skimmers will work. Adverse weather conditions prevented responders from collecting oil from the wellhead, employing mechanical recovery methods, and conducting in situ burns at times during the Deepwater Horizon response. Seasonally short Arctic days and the prevalence of fog and storms also limit the amount of time when response is feasible. Sea state may be calmer in the Arctic than in the Gulf, as the sea ice has a muffling effect on waves. However, the water may grow turbulent over time as the summer ice melts and wave activity increases.[68]

The amount of time when responders are simply unable to work is known as the response gap, and it is based on, among other things, adverse weather conditions. A study of response

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[64] SHELL C-PLAN at 1-13.
[65] SHELL C-PLAN.
[66] Charles W. Schmidt, *Cold Hard Cache: The Arctic Drilling Controversy*, 118 ENVIRONMENTAL HEALTH PERSPECTIVES A394 (2010).
[67] MAR, INC. ET AL., EMPIRICAL WEATHERING PROPERTIES OF OIL IN ICE AND SNOW PROJECT NUMBER 1435-01-04-RP-34501 FINAL REPORT FOR U.S. DEPARTMENT OF THE INTERIOR MINERALS MANAGEMENT SERVICE ALASKA OUTER CONTINENTAL SHELF REGION (Oct. 2008), *available at* [hereinafter WEATHERING PROPERTIES].
[68] Luc Rainville and Rebecca A. Woodgate, *Observations of internal wave generation in the seasonally ice-free Arctic*, 36 GEOPHYSICAL RESEARCH LETTERS L23604 (Dec. 2, 2009).

capabilities in Prince William Sound attempted to quantify the response gap in that region.[69] Researchers identified when response efforts would not be possible based on their investigation of when environmental conditions would cause mechanical recovery systems to fail. For example, they concluded that response efforts would not be affected by wind speeds of less than twenty-one knots, would be impaired but possible in speeds between twenty-one and thirty knots, and would not be possible in winds of over thirty knots. They then used six years of hourly wind, sea state (a measure which includes wave height and wave period), temperature, and visibility data from two locations in Prince William Sound to evaluate the length of time that environmental conditions exceeded response operating limits.[70] They eliminated any days when the locations in the Sound were closed to tanker traffic. The study found that, considering all the environmental limitations together, response operating limits were exceeded, and response was not possible, 38% of the time. That figure rose to 65% of the time during the winter season.[71]

It does not appear that a similar comprehensive response gap analysis has been conducted for the Arctic.[72] However, the Shell C-Plan notes that temperature alone would be a significant limitation. All non-emergency work stops when temperatures reach below -45 degrees Fahrenheit. This limitation would prevent response 50% of the time in the month of January and 64% of the time in the month of March.[73]

B. Locating the Oil

One of the main challenges for oil spill responders in Arctic waters is the problem of locating oil. Oil spilled into broken ice will tend to move with the ice.[74] Oil is also more difficult to locate if it moves under ice floes or becomes encapsulated into surrounding ice. Visual observations are not an adequate means of detection, as the oil is generally hidden from view beneath the ice. In 2009, then-MMS published a report entitled "Arctic Oil Spill Response Research and Development Program: A Decade of Achievement."[75] This paper chronicles issues and advances in oil spill response in the icy Arctic environment. In the paper, MMS noted that the "ability to reliably detect and map oil trapped in, under, on, or among ice is critical to mounting [an] effective response in Arctic water."[76]

The existing method for locating oil in or under ice involves drilling holes in a grid through the ice to detect oil underneath. This method is expensive, dangerous, and not always possible based on ice conditions. MMS has conducted several research studies aimed at evaluating potential solutions to this problem. Ground penetrating radar (GPR) is the only technology viewed as having potential.[77] GPR units can be used by personnel walking on the ice

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[69] NUKA RESEARCH AND PLANNING GROUP, LLC, REPORT TO PRINCE WILLIAM SOUND REGIONAL CITIZENS' ADVISORY COUNCIL: RESPONSE GAP ESTIMATE FOR TWO OPERATING AREAS IN PRINCE WILLIAM SOUND, ALASKA (2007).

[70] *Id.* at 41.

[71] *Id.* at 52.

[72] *See, e.g., Response Gap*, OCEANS NORTH U.S., http://www.oceansnorth.org/response-gap (last visited Sept. 15, 2010) (noting the potential value of a response gap analysis).

[73] SHELL C-PLAN, at 3-20.

[74] WEATHERING PROPERTIES.

[75] U.S. DEPARTMENT OF THE INTERIOR MINERALS MANAGEMENT SERVICE, ARCTIC OIL SPILL RESPONSE RESEARCH AND DEVELOPMENT PROGRAM: A DECADE OF ACHIEVEMENT (2009), *available at* http://www.boemre.gov/tarprojectcategories/PDFs/MMSArcticResearch.pdf [hereinafter ACHIEVEMENT].

[76] *Id.* at 11.

[77] *Id.*

or can be mounted on helicopters flying over the ice at a very low altitude.[78] According to MMS's GPR laboratory and field-testing, the technology can detect oil slicks that are at least two centimeters (approximately one inch) thick in or under one to three feet of ice when used from a helicopter and up to seven feet of ice when a hand-held unit is used.

Though GPR represents an advance over the drilling method, many factors limit its usefulness. MMS's field test report acknowledges that "[d]etection of oil under ice through multi-year ice or rafted/ridged first-year ice might be difficult or impossible."[79] Other types of rough or pocketed ice will pose similar difficulties. Additionally, though oil slicks may tend to be thicker in the Arctic environment than in other places as a result of the cold temperatures, the oil is still likely to spread out, making the ability to detect only slicks that are more than two centimeters thick a serious limitation. Though researchers indicate that the technology has promise, the responder may still need to start out with a basic sense of where the oil is in order for GPR to be of use.

The Shell C-Plan acknowledges that tracking a spill through ice might be necessary. Shell indicates that it could track the oil with drift buoys, radar reflectors, flags, GPR, and laser fluorosensors.[80] In the section on planning for a release in winter pack ice, the Shell C-Plan states that "[p]romising results of tests with Ground Penetrating Radar and other remote-sensing systems could lead to the development and refinement of detection and tracking techniques for oil that is trapped deep within a thick ice layer." The C-Plan goes on to predict that such trapped oil could be dealt with through a "leave in place" strategy, discussed below.[81] It does not appear that MMS had any comment on this aspect of the plan when the agency approved the C-Plan.[82]

C. Mechanical Recovery Technology

In addition to acting as a barrier to detection, ice also poses a physical barrier to mechanical containment and response efforts. Boom and skimmers, which are often deployed in tandem as part of early response efforts, are not very effective in broken ice conditions.[83] For any mechanical recovery technology to work, it needs to "encounter" the oil, which means that the oil needs to be grouped together in a thick enough slick for the recovery system to separate the oil at the surface from the water.

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[78] DF DICKENS ASSOCIATES LTD., SINTEF, THE UNIVERSITY CENTRE AT SVALBARD, BOISE STATE UNIVERSITY, 2006 SVALBARD EXPERIMENTAL SPILL TO STUDY SPILL DETECTION AND OIL BEHAVIOR IN ICE: SUMMARY FIELD REPORT (Apr. 12, 2006), http://www.boemre.gov/tarprojects/569/SummaryFieldReport.pdf [hereinafter "SVALBARD 2006"].

[79] Svalbard 2006.

[80] SHELL C-PLAN, at 1-27.

[81] *Id.* at 3-27.

[82] *See* MINERALS MANAGEMENT SERVICE OFFICE OF PUBLIC AFFAIRS, QUESTIONS AND ANSWERS ON SHELL'S OCS CHUKCHI SEA EXPLORATION PLAN, *available at* http://www.boemre.gov/ooc/PDFs/CHUKCHI_SEA_QA1209.pdf (last visited Sept. 15, 2010); Press Release, Minerals Management Service, Salazar Conditionally Approves Shell's Exploration Plan for Certain Chukchi Sea Leases (Dec. 7, 2009), http://www.boemre.gov/ooc/press/2009/press1207.htm (last visited Sept. 15, 2010).

[83] Of course, boom and skimmer technology can be of only limited use in spills in non-Arctic waters as well. The oil recovery from boom-and-skimmer efforts as part of the Deepwater Horizon response only constituted 3% of the total amount of oil recovered. JANE LUBCHENCO ET AL., DEEPWATER HORIZON OIL BUDGET: WHAT HAPPENED TO THE OIL? (Aug. 4, 2010), http://www.deepwaterhorizonresponse.com/posted/2931/Oil_Budget_description_8_3_FINAL.844091.pdf.

Boom is difficult to deploy through broken ice. MMS notes that boom is "of little to no use in large moving ice floes or in ice concentrations greater than 30%."[84] Boom for use in the Arctic also must be made of a durable material that can withstand impacts from pieces of ice.

Skimmers can become clogged with ice and slush, and they need to be positioned between ice floes, which may not always be possible. Additionally, a skimming vessel will break up ice floes, moving the natural ice barrier and letting the oil spread out, thus making it harder to skim.[85] The oil that is skimmed will still likely contain pieces of ice. Although some advances in the material used to make skimmers, such as the development of grooved skimming drums, have improved skimmer efficiency in ice conditions, overall skimming potential is limited by the presence of ice.[86]

If the ice cover is too great, and mechanical recovery is not possible, it may be necessary to let the oil become incorporated into the ice and deal with it when the ice melts.[87] MMS notes: "For high ice concentrations of 8/10 or more, most of the spilled oil (especially from a subsea blowout) will become immobilized or encapsulated within the ice . . . . Oil encapsulated within the ice is isolated from any weathering processes (evaporation, dispersion, emulsification). The fresh condition of the oil when exposed (e.g. through ice management or natural melt processes) enhances the potential for in situ burning." This strategy effectively requires responders to leave oil in place but somehow track it, so that they can attempt to remove it once it is freed from the ice but before it re-enters the marine environment. This is sometimes referred to as "mining" of oil.[88] In the interim, the oil is unlikely to degrade, making it more susceptible to burning but less likely to be reduced in amount by natural processes.

This "leave-in-place" strategy does not appear to have been used during an actual spill, though it is the subject of research. The Shell C-Plan indicates that this strategy might be used for a spill in early winter. The plan predicts that "[t]ypically, within a day or two, new ice would completely surround the oil, encapsulating, immobilizing and preserving the condition of the oil. The ice-encapsulated oil can be marked and tracked for removal when the ice is safe to work on, or the oil could be tracked until spring. At that time the oil would become exposed at the surface through brine-channel migration or through surface melt down to the small entrapped oil droplets."[89]

The behavior of oil in ice is an important topic of research.[90] According to researchers, the accepted view is that oil becomes encapsulated as ice forms around it. As the ice begins to melt, the oil is transported through the ice to the surface of the ice through brine channels, which are paths through the ice where salt is very concentrated.[91] However, newer research calls this assumption about transportation up to the surface into question, and there remain unknowns about the role of brine channels as a pathway for marine exposure to oil. Questions remain about

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[84] ACHIEVEMENT at 15.

[85] Hans V. Jensen & Joseph V. Mullin, *MORICE—new technology for mechanical oil recovery in ice infested waters*, 47 MARINE POLLUTION BULLETIN 453 (2003).

[86] Victoria Broje and Arturo A. Keller, *Improved Mechanical Oil Spill Recovery Using an Optimized Geometry for the Skimmer Surface*, 40 ENVIRON. SCI. TECHNOL. 7914 (Oct. 26, 2006).

[87] ACHIEVEMENT at 15.

[88] SHELL C-PLAN, at 3-27

[89] *Id.* at 3-26.

[90] *See, e.g.*, WEATHERING PROPERTIES; PROGRESS REPORT, OIL IN ICE: TRANSPORT, FATE, AND POTENTIAL EXPOSURE (Progress Report for the Period Oct. 15, 2008 to Apr. 15, 2009), *available at* http://www.crrc.unh.edu/progress_reports/sintef/04_2009/index.htm.

[91] WEATHERING PROPERTIES.

whether oil may be pulled into the brine channels and, rather than moving to the surface of the ice, move down through the ice and into the water column.[92]

The Shell C-Plan comments on the difficulties of using mechanical response technologies in icy conditions. The plan notes that even low concentration of individual ice floes "can obstruct containment or deflection boom, prevent oil from accumulating in large pools, and block the flow of oil toward a recovery device."[93] Shell explains that, though it will modify mechanical response tactics to suit the Arctic environment, as ice concentrations increase, non-mechanical tools such as in situ burning and dispersants (both discussed below) will become more practical.[94]

D. In Situ Burning

In situ burning is another response technique that was used in the Deepwater Horizon response and would be used in any Arctic oil spill response. This strategy requires gathering the oil either with fireproof boom or between natural ice berms. It also requires that the oil not be overly weathered. Burning is an important strategy in the Arctic, where there is less risk of having a fire spread out of control. Additionally, there is potentially less concern about the negative air quality impacts of burning as there are lower concentrations of people and wildlife that could be affected. Moreover, oil mixed with some ice, snow, or slush can still burn.

Burning in the Arctic, however, is not without difficulty. In order to stage the fire-proof boom, vessels must be able to can access the area and boom must be pre-staged for quick deployment. Oil is more difficult to ignite at lower temperatures. Chemical "herders" may be required to gather and thicken the oil, but no commercially-produced herders are currently approved for use in Arctic waters.[95] Oil that enters the water column before hitting the surface, such as from a subsea pipe leak or blowout, will be more likely to become emulsified and spread out once it reaches the surface and will therefore be harder to burn. Because of the propensity of oil to spread, in situ burning is a technique that will work best with a rapid response.

As with all response techniques, the efficiency of in situ burning will vary widely. Efficiency rates of 90% were achieved in an experiment in Norway that simulated a tanker spill,[96] but a 1998 well blowout study estimated only 3.4-6.4% efficiency in fall freeze-up conditions on open water.[97]

The Shell C-Plan takes a positive view of in situ burning, asserting that "the consensus of research" is that it is an "effective technique with removal rates of 85 to 95 percent in most situations."[98] The C-Plan describes difficulties associated with ice, but also suggests that ice may assist burning by containing the oil, dampening wave action, and reducing the propensity of

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[92] Amy Merten, NOAA Office of Response and Restoration, Coastal Response Research Center, "NOAA's Increased Preparedness for Arctic Response," Presentation at the National Ice Center Symposium (June 11, 2009).
[93] SHELL C-PLAN, at 1-27.
[94] *Id.* at 1-27-1.28.
[95] WORLD WILDLIFE FUND, NOT SO FAST: SOME PROGRESS IN SPILL RESPONSE BUT US STILL ILL-PREPARED FOR ARCTIC OFFSHORE DEVELOPMENT (2009) (reviewing and critiquing MMS's "Decade of Achievement" report).
[96] Svalbard 2006.
[97] SL ROSS ENVIRONMENTAL RESEARCH, D.F. DICKINS AND ASSOCIATES, VAUDREY AND ASSOCIATES, EVALUATION OF CLEANUP CAPABILITIES FOR LARGE BLOWOUT SPILLS IN THE ALASKAN BEAUFORT SEA DURING PERIODS OF BROKEN ICE (June 1998), *available at* http://www.boemre.gov/tarprojects/297/297AA.pdf.
[98] SHELL C-PLAN, at 3-24, 3-32 to 3-33.

the oil to spread out in a thin layer.[99] Shell does not estimate the percentage of days that wind and wave conditions would likely prevent in situ burning.

E. Chemical Countermeasures

Dispersants were used extensively in the Deepwater Horizon response and are often a critical component of oil spill response. However, their potential Arctic use is limited by uncertainty over their effectiveness and toxicity in that environment.

Dispersant effectiveness depends on the properties of the oil, the amount of weathering that has taken place, and the energy available to mix the dispersants into the oil. Aerial spraying can occur even during broken ice or bad weather conditions, but mixing might be reduced. Application by boat can increase mixing as the vessel churns up the water, but requires a boat capable of traveling in the ice and appropriate weather. Once the oil is encapsulated into or emulsified with the water, dispersants are unlikely to be effective. A 2001 study commissioned by the Prince William Sound Regional Citizens' Advisory Council found that dispersants were less than 10% effective when applied to Alaska North Slope crude oil spilled on water at the temperature and salinity common in the estuaries and marine waters of Alaska.[100] The study found that temperature had a strong effect on the behavior of the oil, which in turn affected dispersant effectiveness. However, an MMS/ExxonMobil-sponsored project, based on testing at Ohmsett, the National Oil Spill Response Test Facility in New Jersey, concluded that dispersants could be effective in cold water.[101] This study estimated dispersant effectiveness at a range of 82% to 99%. More research is needed regarding dispersant effectiveness in situations involving ice cover, heavy wind conditions, and weathered oils.[102]

Concerns about dispersant toxicity in the Arctic are similar to concerns about dispersant toxicity generally. One Arctic-specific issue is the speed of biodegradation of dispersed oil. Dispersants break down oil into smaller droplets, which may then be more easily biodegraded by oil-consuming bacteria.[103] Oil-consuming bacteria are present in Arctic waters, but they may break down dispersed oil more slowly than in warmer waters.[104] As a result, dispersed oil may be present in the ecosystem for a longer period of time. Moreover, concerns about the long-term fate and effects of dispersed oil in the Arctic are potentially magnified because of the lack of baseline data about the environment.

The Alaska Regional Contingency plan sets out dispersant guidelines.[105] Within the Alaska plan, the North Slope subarea contingency plan sets out the decision-making process for the use of dispersants: "Any decision regarding the use of dispersants and/or *in situ* burning in

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[99] *Id.* at 3-25.

[100] ADAM MOLES, LARRY HOLLAND, AND JEFFREY SHORT, THE EFFECTIVENESS OF COREXIT 9527 AND 9500 IN DISPERSING FRESH, WEATHERED, AND EMULSION OF ALASKA NORTH SLOPE CRUDE OIL UNDER SUBARCTIC CONDITIONS (April 2001), *available at* http://www.pwsrcac.org/docs/d0001400.pdf.

[101] SL ROSS ENVIRONMENTAL RESEARCH, DISPERSANT EFFECTIVENESS TESTING IN COLD WATER (August 2002) *available at* http://www.boemre.gov/tarprojects/450/450mmsExCold.pdf.

[102] *See, e.g.*, PRINCE WILLIAM SOUND OIL SPILL RESPONSE INSTITUTE, ADVANCING OIL SPILL RESPONSE IN ICE-COVERED WATERS 4 (2003), *available at* http://www.pws-osri.org/publications/OilIce_final.pdf (identifying research needs to improve response abilities in icy environments)

[103] There is dispute within the scientific literature about whether dispersants promote biodegradation of oil. For more information, see the draft staff working paper on dispersants.

[104] *See* WORLD WILDLIFE FUND, OIL SPILL RESPONSE CHALLENGES IN ARCTIC WATERS 7 (2007).

[105] ALASKA REGIONAL RESPONSE TEAM, UNIFIED PLAN, ANNEX F: CHEMICAL COUNTERMEASURES F-11 (1999), *available at* http://www.akrrt.org/UnifiedPlan/F-Annex.pdf [hereinafter ANNEX F].

the North Slope Subarea will be made by the [federal and state on-scene coordinators] in consultation with the Alaska Regional Response Team" and should also involve the North Slope Borough.[106] The plan includes specific dispersant guidelines for Alaska.[107] The federal on-scene coordinator must "examine conventional response alternatives, such as containment and cleanup, for comparison to dispersant application" and may consider dispersant use only "when an effective conventional response is not feasible or not totally adequate in containing/controlling the spill."[108]

Shell's dispersant plan for Chukchi exploration is to store 25,000 gallons of Corexit 9500 in Anchorage and pre-stage another 1,300 gallons with Alaska Clean Seas on the North Slope.[109] The Shell C-Plan contends that "[d]ispersant use is a rational approach to mitigate environmental impacts from spills when sea states or other factors limit or negate conventional countermeasures."[110] The plan suggests that, because mechanical recovery and in situ burning opportunities might be limited, dispersants are a valuable option.[111] However, the plan also notes the potential limitations on dispersant effectiveness. It recognizes that because the properties of the oil in the reservoir are unknown, on-site testing would be a condition of dispersant use. The plan also notes that, to be effective, dispersants must be applied to fresh crude before it has an opportunity to emulsify or weather, and that dispersants are less effective on colder, more viscous oil. Finally, Shell states that it would try to avoid applying dispersant on or near sea birds or marine mammals.[112]

F. Bioremediation and Natural Processes

Oil will degrade in the water over time as it is consumed by bacteria. Bioremediation is "the act of adding materials to contaminated environments to cause an acceleration of the natural biodegradation processes."[113] The National Contingency Plan, which governs oil spill response, specifies that "bioremediation agents" are "microbiological cultures, enzyme additives, or nutrient additives that are deliberately introduced into an oil discharge and that will significantly increase the rate of biodegradation to mitigate the effects of the discharge."[114] Bioremediation may be a potential response strategy in the Arctic, where the temperature and weather conditions otherwise slow the natural biodegradation process.

Responders have used bioremediation techniques in the cleanup of a number of major oil spills.[115] For example, one day after the June 8, 1990 spill from the *Mega Borg* off the coast of Texas, the federal on-scene coordinator authorized the use of a bioremediation product on the open-sea oil slick.[116] It was unclear how effective the product was, and this response highlighted

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[106] ALASKA REGIONAL RESPONSE TEAM, UNIFIED PLAN, NORTH SLOPE SUBAREA CONTINGENCY PLAN, RESPONSE SECTION, A-22 (1999), *available at* http://www.akrrt.org/NSplan/nstoc.shtml.
[107] ANNEX F.
[108] *Id.* at F-2.
[109] SHELL C-PLAN, at 3-40.
[110] *Id.* at 3-37.
[111] *Id.* at 3-38.
[112] *Id.* at 3-42.
[113] Richard P.J. Swannell et al., *Field Evaluations of Marine Oil Spill Bioremediation*, 60 MICROBIOLOGICAL REV. 342, 342 (1996) (internal quotations omitted).
[114] 40 C.F.R. § 300.5.
[115] Swannel, at 351-52.
[116] *Id.* at 351.

the difficulties of open-sea application.[117] Responders applied bioremediation materials—including nutrients, fertilizer, and exogenous bacteria—to the shoreline after the *Amoco Cadiz* wrecked off the coast of France.[118] The approaching tourist season, however, prevented more extensive use in the area.[119]

The most prominent experimentation with onshore bioremediation occurred after the *Exxon Valdez* spill.[120] The level of endogenous oil-metabolizing bacteria had already increased on the Alaska shoreline. Responders decided to promote growth of these endogenous bacteria by adding nutrients and fertilizer to the shoreline of Prince William Sound, instead of seeding the shoreline with exogenous bacteria.[121] This technique was considered successful.[122] As with the *Amoco Cadiz* response, bioremediation in the *Exxon Valdez* response involved shoreline use, rather than use in open water.

There are concerns that low temperatures and the variable salinity in the Arctic will decrease the potential of bioremediation. Research done in Norway, however, suggests that microbial communities located in ice can begin to break down oil.[123] A patent issued in 2001 registers an improved method of administering bacteria to an open-water spill, and a pending patent application filed by a German group discloses a technique specifically aimed at bioremediating open water Arctic spills.[124]

The regulatory framework governing bioremediation processes is complicated. The NCP treats bioremediation products similarly to dispersants, with a product schedule and authorization requirements.[125] Twenty-four products are listed on the product schedule. The North Slope Subarea Area Contingency Plan also discusses bioremediation products, and contains a general protocol for testing products listed on the NCP schedule for use in Alaskan waters.[126] These products are not preapproved for any use. A later working paper on the status of oil spill research and development will provide a more detailed discussion of bioremediation and the applicable regulatory structure.

III. Geographic and Cultural Issues

A. Response Posture and Readiness

As noted above, the Beaufort and Chukchi Seas are different in terms of response needs. This section focuses mainly on response in the Chukchi, where the distance from shore and lack

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[117] *Id.*; *see also id.* at 358 ("[T]here is little convincing evidence to suggest that bioremediation is effective at sea. This is partly due to the logistical difficulties involved in conducting controlled open-sea trials. Further research is required to derive an effective bioremediation strategy at sea.") (internal citations omitted).

[118] *Id.*

[119] *Id.*

[120] *Id.* at 352.

[121] *See id.*; P.H. Pritchard et al., *Oil Spill Bioremediation: Experiences, Lessons and Results from the Exxon Valdez Oil Spill in Alaska*, 3 BIODEGRADATION 315 (1992).

[122] Pritchard at 315.

[123] SINTEF, Oil Biodegradation in Arctic Ice, http://www.sintef.no/Home/Materials-and-Chemistry/Marine-Environmental-Technology/Projects-and-News/Oil-biodegradation-in-Arctic-ice/. SINTEF is studying a number of techniques for combating oil spills in ice covered water. *See* SINTEF, JIP Oil in Ice, http://www.sintef.no/Projectweb/JIP-Oil-In-Ice/.

[124] U.S. Patent No. 6,267,888 (issued July 31, 2001); U.S. Patent Application Publication No. US2010/0051541 A1.

[125] 40 C.F.R. § 300 Subpart J.

[126] ANNEX F at F-85.

of infrastructure make access, let alone response, difficult. Some of these concerns do apply to the Beaufort as well.

Coast Guard officials have noted over the past few years that they are ill-prepared to respond to a major spill in the Arctic.[127] In addition to the response limitations detailed above, the Coast Guard lacks ice-class vehicles capable of responding to a spill under Arctic conditions. The Coast Guard has three polar icebreakers: the *Polar Star*, the *Polar Sea*, and the *Healy*. Both the *Polar Star* and the *Polar Sea* are currently non-operational, and both have exceeded their intended 30-year service lives.[128]

The *Polar Sea*, originally commissioned in 1978, was returned to service in 2006 following a rehabilitation project intended to extend the vessel's service life to 2014.[129] In June of this year the Coast Guard announced that the *Polar Sea* would cease operations until January 2011 due to "an unexpected engine casualty," the cause of which is still under investigation.[130] Another rehabilitation project, budgeted at $60 million and intended to extend the life of the *Polar Star* by seven to ten years, began in 2006.[131] It is expected to be completed in 2013. The most recent Coast Guard estimates suggest that the work required to further extend the lives of the *Polar Sea* and the *Polar Star* would cost about $400 million per vessel (in 2008 dollars), and the cost of replacement ships would be between $800-925 million.[132] The same report predicts that it would take eight to ten years to build the new ships.

The Coast Guard procured the third ship, the *Healy*, in the 1990s, and commissioned it in 2000. The *Healy* was supposed to complement the *Polar Sea* and the *Polar Star* with its greater research support capabilities. It has less icebreaking capability than the other ships.

The funding for operations and maintenance on all of these vessels has come through the National Science Foundation's budget since FY2006, because of the ships' increasing research functions.[133] Should a major drilling program begin offshore in the Chukchi Sea, additional operational polar icebreakers would be required to reach a rig or a spill in icy conditions. Decisions regarding whether to repair the current vessels or to acquire additional ice-class vessels are currently in the hands of Congress and subject to the budgeting process.

Distance is another major hurdle, even in open water and good weather conditions. Though the Coast Guard has a presence on the North Slope, the nearest Coast Guard operations base to the Chukchi region is on Kodiak Island, which is approximately 1,000 miles from the leasing sites. In Northern Alaska, the Coast Guard has only forward operating locations, not fully staffed and equipped bases. No infrastructure presently exists along the Chukchi. If drilling moves forward, some of this infrastructure would naturally be created by industry, but in a seasonal drilling environment it is unclear how much permanent development can be expected.

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[127] *See, e.g.*, Captain J.J. Fisher, "Policy & Cooperation in the Arctic," Presentation at Capitol Hill Ocean Week, (June 10, 2010), *available at* http://nmsfocean.org/CHOW-2010-agenda; "Oil Spill Response in the U.S. Arctic: A U.S. Coast Guard Perspective," Presentation at the Environmental Law Institute (Mar. 11, 2010), *available at* http://www.eli.org/program_areas/ocean_arctic_spill.cfm.

[128] RONALD O'ROURKE, CONGRESSIONAL RESEARCH SERVICE, COAST GUARD POLAR ICEBREAKER MODERNIZATION: BACKGROUND, ISSUES, AND OPTIONS FOR CONGRESS 1 (July 2, 2010).

[129] *Id.* at 3.

[130] *Id.* at 4.

[131] *Id.*

[132] *Id.* at 10-11.

[133] *Id.* at 7.

In the Beaufort Sea, response capability is increased by proximity to the city of Barrow and the shoreline. However, Barrow is still a small community of less than 5,000 people.[134] Wainwright, the second-largest town in the North Slope Borough and on the Chukchi Sea coast, had a population of about 550 at the time of the 2000 census.[135] A major spill would require bringing in responders, but it would be difficult for this region to support a large influx of response personnel. The nature of the sea also complicates the staging of operations. The sea is too shallow at Wainwright to support a full dock, and there is only a boat ramp from which to launch smaller vessels. The nearest dock capable of supporting large vessels is at Prudhoe Bay in the Beaufort Sea.

Shell's plan for exploratory drilling in the Chukchi involves a small flotilla of ships available to assist with response efforts. The Shell C-Plan asserts that an oil spill response vessel will be positioned so that it could arrive at a spill site within one hour.[136] It also anticipates that a larger transport vessel will be able to arrive within 24 hours and would be able to store 287,100 barrels of oil or oily water, which is the worst-case planning discharge amount. Additional personnel and resources, according to the plan, will be mobilized through the contractor Alaska Clean Seas, which has personnel stationed on the North Slope in Prudhoe Bay and along the Beaufort Sea. They have an advisor on Chukchi exploration issues but do not appear to have any response personnel stationed west of Barrow at present.[137] According to the C-Plan, equipment will be pre-staged at Wainwright, where there is a small airport and a boat ramp from which to deploy the equipment to the spill.

Environmental groups have criticized this plan, asserting that the estimated response times are unrealistic. Pew Environment's U.S. Arctic program is currently drafting a report on oil spill response in the Arctic, which will include a response scenario analysis for the Chukchi Sea. This report will be peer-reviewed and should be available by the end of October 2010.[138]

B. Subsistence Resource Use

Subsistence resource uses provide an important background to any discussion of offshore drilling in the Arctic. Inupiat Eskimos are the dominant population in Alaska's Arctic region and have practiced subsistence hunting and fishing for thousands of years. For most residents of the North Slope, a subsistence-based lifestyle is an economic necessity. The cost of living is high as a result of transportation costs for goods and services. While jobs are available in oil extraction facilities in the Prudhoe Bay area, the per-capita income does not correspond to the high cost of living.[139] The Inupiat are forced to supplement their diet through subsistence hunting and fishing since the harsh weather makes agriculture impossible.[140] Walruses, seals, and caribou make up

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[134] U.S. Census Bureau, Population for the 15 Largest County Equivalents and Incorporated Places in Alaska: 1990 and 2000, *available at* http://www.census.gov/census2000/pdf/ak_tab_6.PDF.

[135] U.S. Census Bureau, Fact Sheet, Wainwright city, Alaska, *available at* http://factfinder.census.gov/home/saff/main.html?_lang=en (search for Wainwright, AK).

[136] SHELL C-PLAN at 1-19, 1-25.

[137] *See* Alaska Clean Seas, Yearbook 30-41 (2009), *available at* http://www.alaskacleanseas.org/adobefiles/2010%20Yearbook_web.pdf (listing personnel and office locations)

[138] Email to National Commission Staff from Marilyn Heiman, U.S. Arctic Program, Pew Environment Group, received Sept. 15, 2010.

[139] COMMITTEE ON THE CUMULATIVE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES ON ALASKA'S NORTH SLOPE, NATIONAL RESEARCH COUNCIL, CUMULATIVE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES ON ALASKA'S NORTH SLOPE 20 (2003) [hereinafter CUMULATIVE ENVIRONMENTAL EFFECTS].

[140] *Id.* at 132.

part of the Inupiat diet, but the bowhead whale is of particular importance due to its size and food potential.

Bowhead whales can reach 60 feet in length and weigh more than 120,000 pounds. They migrate from Russian to Canadian waters and back through the Chukchi and Beaufort Seas. They are the most important subsistence animal for the coastal communities of northwest and northern Alaska.[141] Of the 74 percent of North Slope Borough households that responded to a 1998 survey, nearly 69 percent of Inupiat families reported that the bowhead whale makes up more than half of their subsistence food diet.[142]

Whale hunting, and the customs surrounding whale hunting, are also an important part of the cultural heritage of the Inupiat. A 1986 study estimated that 70 percent of the population of Wainwright, Alaska directly participates in preparing and preserving a whale that has been caught. No other communal activity involves as high a level of participation.[143]

Many coastal Inupiat are strongly opposed to offshore drilling, largely because it can interfere with the migratory patterns and well-being of the bowhead whale. Much of this opposition relates to concerns over seismic activities, which can drive the whales off their normal migratory path.[144] Oil spills present another hazard. In case of a spill, whales may pass through the oil, exposing their bodies to harmful hydrocarbons. No research has studied the toxic effects of inhaled or ingested oil on bowhead whales, but scientists believe the consequences would be similar to those for polar bears and seals, which are both seriously affected by oiling.[145] While no major oil spill has occurred in the Beaufort Sea, concerns about the potentially calamitous effects of a spill on the bowhead whale population are a major factor in any evaluation of offshore drilling.

IV. Areas for Commission Inquiry

The areas for Commission inquiry suggested by this draft are all topics that can and should be discussed by panelists at the hearing on September 27, 2010. Staff recommends that the Commission ask the panelists to address these issues.

Shell's exploratory drilling C-Plan is currently the only formal industry proposal for contingency planning and oil spill response in the Arctic. While Shell's plan acknowledges many of the challenges of spill response in the Arctic, questions remain as to whether its solutions to those challenges are realistic. For its final report, the Commission may want to consider the forthcoming analysis conducted by the Pew Environmental group in evaluating the Shell plan and the requirements for Arctic response plans generally.

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[141] ALASKA DEPARTMENT OF FISH & GAME, BOWHEAD WHALE (2008), http://www.adfg.state.ak.us/pubs/notebook/marine/bowhead.php.

[142] CUMULATIVE ENVIRONMENTAL EFFECTS at 135.

[143] *Id.*

[144] *See* NATIONAL MARINE FISHERIES SERVICE, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION, BIOLOGICAL OPINION 13 (2002) (noting that, with reference to the construction and operation of the Liberty Oil production island in the Beaufort Sea, that bowhead whales will defect from their normal migratory paths at distances of up to 35 miles from seismic operations). Changes in migratory patterns will have a significant effect on Inupiat hunting: hunters must follow the whales into riskier waters, making the hunting trip longer and more dangerous. Further, the hunters may not be able to transport the carcass to the shore before it begins deteriorating, thus jeopardizing the whale's food potential.

[145] CUMULATIVE ENVIRONMENTAL EFFECTS at 103.

The Commission may also want to consider the regulatory standards to which the C-Plan is keyed. The regulations set out requirements for spill response planning, such as the volume for the worst-case discharge scenario and the proximity to the well of spill response equipment. The Shell plan appears to go beyond these standards, but other drillers may not. Environmental groups have criticized the current response planning standards as inadequate because they allow an applicant to underestimate the risk of, and do not require sufficient response capacity in the event of, a worst-case discharge. Bills in both the House and Senate attempt to respond to these concerns by requiring response plans to include a more comprehensive risk analysis, greater detail about response capability, and specific information on measures to be used in case of a loss of well control.[146] The Commission, after further review of the regulations and an evaluation of the action Congress is considering, may wish to recommend amending the regulations.

The Commission may also want to consider the resources brought to bear to review contingency plans. The Shell C-plan process, where MMS did request further information in support of the plan, shows that at least some review of the plan took place. The Commission may wish to consider whether the new BOEMRE possesses the expertise, resources, and appropriate incentives to review spill response plans, and whether other agencies should play a role in such review. For example, EPA and NOAA may possess scientific expertise relevant to the evaluation of Arctic response plans, and the Coast Guard may possess relevant operational expertise. EPA and NOAA are currently involved in the environmental review process, but could play a larger role in the spill response planning process. Proposed Congressional actions would require the lead agency reviewing the response plan, such as BOEMRE, to obtain the written concurrence of other agencies that have a significant responsibility to remove, mitigate damage from, or prevent or reduce a substantial threat of the worst-case discharge of oil. The Commission may wish to consider this and other mechanisms to incorporate consultation with other agencies into spill response planning.

It is unclear the extent to which and the speed at which the Coast Guard, the oil spill response contractors, and industry could mobilize response equipment and personnel in the event of a spill in the Chukchi Sea. Because the Coast Guard has an admitted lack of response capacity in the Arctic, immediate responsibility would fall on industry and their oil spill response contactors. Shell, at least, accepts this responsibility. One of the questions for the Commission is whether increased Coast Guard capacity should be a prerequisite for offshore activity or whether the government is comfortable with accepting responsible parties (and private contractors) as primary spill responders—especially in light of widespread public concern about BP's role as the responsible party in the Deepwater Horizon response.

The Commission may also wish to consider encouraging research in two areas. First, further research is needed on the dynamics of the Arctic marine ecosystem and the ways in which marine mammals use sea and shoreline resources. Second, further information is required on the effectiveness of common response methods and whether they can be modified for the Arctic environment. The use of dispersants, bioremediation, and more advanced GPR technology should be investigated to improve response capacity. A response gap analysis, such as the analysis conducted in Prince William Sound, may be a useful tool to identify which response mechanisms should be prioritized.

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[146] *See* The Consolidated Land, Energy, and Aquatic Resources Act of 2009, H.R. 3534, 111th Cong. (2009); Outer Continental Shelf Reform Act of 2010, S. 3516, 111th Cong. (2010).

The United States Geological Service is presently evaluating the state of scientific knowledge about the Arctic and will identify specific areas for research. DOI directed this analysis on April 13, 2010 (a week before the Deepwater Horizon explosion).[147] Potential mechanisms for funding oil spill response research in general, and in the Arctic specifically, will be discussed in a later working paper.

Another question the Commission may consider is the role of the local Inupiat community in setting up response infrastructure and assisting with response efforts. The Prince William Sound Regional Citizens' Advisory Council, established after *Exxon Valdez*, has been suggested as a model for incorporating local communities into spill planning and spill response. The Commission may wish to recommend that a similar council be created in the North Slope communities and be funded by industry engaging in offshore activities.

[147] Press release, Department of Interior, Secretary Salazar Unveils Arctic Studies Initiative that will Inform Oil and Gas decisions for Beaufort and Chukchi Seas (April 13, 2010).

Prince William Sound Regional Citizens' Advisory Council
Citizens promoting environmentally safe operation of the Alyeska terminal and associated tankers.

The Observer, July, 2009

Begich endorses citizen oversight for Alaska's Arctic regions

Alaska Senator Mark Begich has called for the creation of an Arctic Regional Citizens' Advisory Council to ensure local voices will be heard on oil industry development in Alaska's northernmost areas.

The new council would represent communities and organizations with interests in the Beaufort and Chukchi seas, North Slope and Northwest Arctic boroughs. Citizens from St Lawrence Island, the Alaska Eskimo Whaling Commission, the Alaska Beluga Whale Committee, the Alaska Eskimo Walrus Commission, the Alaska Nanuq Commission, the Ice Seal Commission, environmental, recreation and tourism organizations, and local villages would have a voice to ensure safe resource development.

Begich's draft legislation states that the Arctic council will be modeled after the citizens' councils for Prince William Sound and Cook Inlet. According to the legislation, the existing councils have "proven effective at increasing trust and communication between citizens, the oil industry, and government." The Arctic council would be funded by the oil industry.

In an editorial on June 27, the Anchorage Daily News voiced support for Begich's plan.

"His idea is modeled on the successful citizens' advisory council set up in the early 1990s for Prince William Sound after the Exxon Valdez oil spill. That council is a well-funded watchdog, keeping an eye on the oil pipeline and tanker operations to help avoid a repeat disaster," the paper said.

Begich has tried to ease industry concerns about the Arctic council, "This is not a roadblock to development," he said in a June speech in Annapolis, Md. In fact, Begich said, the advisory council "should be a proactive way to ensure that development occurs in a responsible manner."

But Dave Harbour, former member of the Regulatory Commission of Alaska and previous chairman of the Anchorage Chamber of Commerce disagreed in a guest editorial in the June 29 Anchorage Daily News.

Harbour is concerned that a council would "worsen the existing regulatory structure and increase costs to consumers and taxpayers," and that multiple review processes would "add further complexity through endless legal action."

Steve Lewis, Prince William Sound's council president, argued just the opposite in his own guest editorial submitted to the paper.

"The reality is that a citizens' council would be a boon rather than a burden to everyone concerned with Arctic oil development," Lewis wrote.

Communication between the industry, state agencies and the council can

"take place within the existing regulatory structure, without the creation of another layer of bureaucracy," Lewis said, "A careful reading of the Oil Pollution Act and the legislation proposed by Senator Begich will show that a citizens' council, contrary to the fears expressed by some, will be a benefit to all concerned rather than a burden to be borne by one group."

"We agree with Sen. Begich that the citizens' council concept has proved itself in Cook Inlet and Prince William Sound, and we hope citizens of the state's far north will soon have the same outlet for their voices on oil-development issues," Lewis said. "If asked, we'll be happy to provide information and expertise to help the new council get on its feet," Lewis added on July 8.

The proposal for the new council is one of five proposals that Begich hopes will be a part of a new national strategy to contend with the changing climate. President Obama recently called for a task force to develop a new national oceans policy.

Besides the Arctic council, Begich would like to see the U.S. ratify several international arctic treaties, create a new Arctic ambassador, increase funding for science programs to better understand the Arctic environment, and invest in infrastructure enhancements such as ice breakers and submarines.

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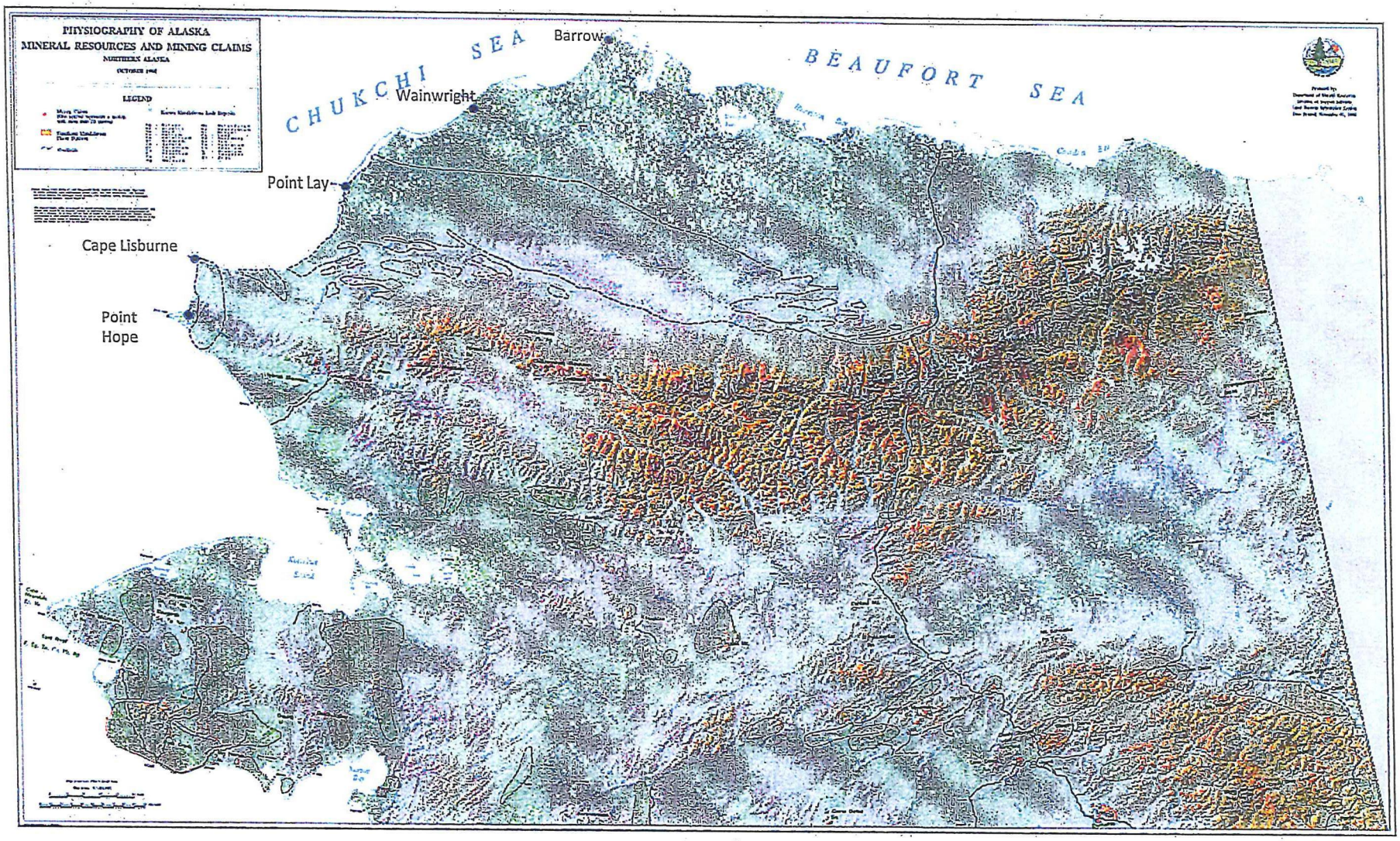
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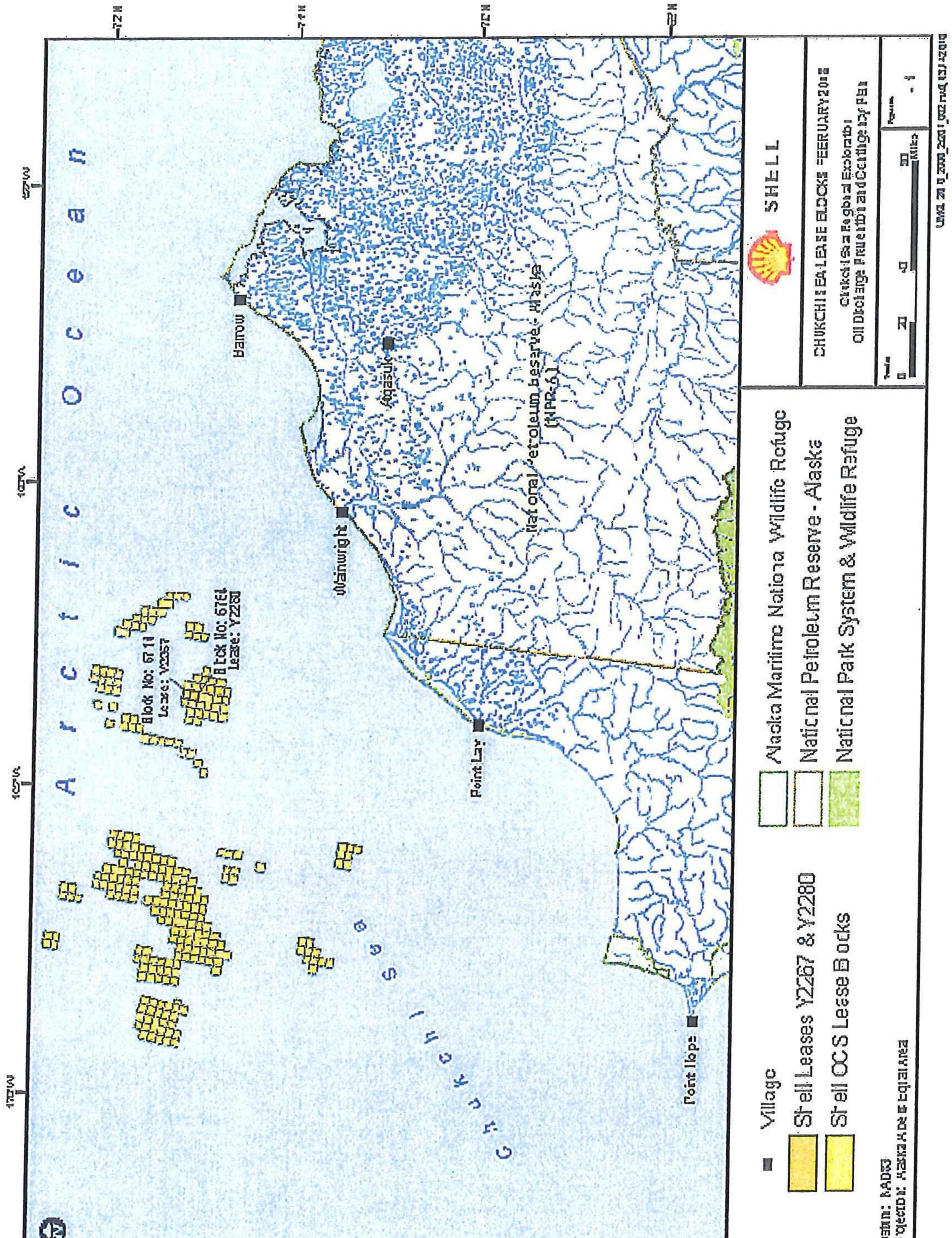

Source: Shell Chuchki C-Plan, March 2010
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PETE SLAIBY

Vice President for Exploration and Production, Shell Alaska

Day 1, Panel 5: Response in the Arctic

Anticipated Focus:

Pete Slaiby will explain Shell's proposed exploratory drilling plan in the Chukchi Sea. He will discuss Shell's oil spill contingency plan and explain the various measures Shell intends to put in place to prevent a spill and respond in the event a spill occurs. Slaiby will also speak to Shell's investment in the Chukchi Sea and the time constraints the company faces while waiting for a determination on whether drilling in the Arctic can go forward.

Biography:

Pete Slaiby started his career with Shell in New Orleans in 1980, working in the Gulf of Mexico as a petrophysical field engineer. He later moved into a surveillance engineering role in the Gulf of Mexico. Slaiby completed his assignment in New Orleans, working in the Western Gulf and later on frontier development concepts in the Florida Gulf. In 1984, Slaiby moved to the Shell Oil Company subsidiary Pecten International in Houston. He held international assignments in various development and production operational roles that took him to Syria as the project engineer for the Thayyem Development. Slaiby traveled to Brazil as the project engineer for the Merluza Field topside work and completed the assignment as engineering and operations manager for Pecten Brazil.

In 1995, Slaiby moved to Douala Cameroon as technical manager for both the Pecten-operated Mokoko Abana concession as well as numerous partner-operated ventures in Cameroon. In 1999, he was assigned the role of asset manager for part of the Shell Expro Southern North Sea gas business in Lowestoft, Suffolk (UK). In 2004, Slaiby assumed responsibility for one of Shell's oldest business relationships as Brunei Asset Manager. In these roles he managed the life-cycle of the hydrocarbon production businesses, and most importantly, ensured the facilities met the highest health, safety and environmental standards.

In May 2008, Slaiby was named General Manager of Shell's Alaska business. In July 2009, Slaiby was promoted to Vice President of Shell Alaska Exploration and Appraisal. In this role, he manages Shell's exploration and production activities in Alaska, including Shell's continued efforts to develop relationships with a wide variety of stakeholders. Slaiby holds a B.E. in mechanical engineering from Vanderbilt University.

CAPTAIN JOHN CAPLIS

Chief, Office of Incident Management and Preparedness, United States Coast Guard

Day 1, Panel 5: Response in the Arctic

Anticipated Focus:

Captain John Caplis will discuss the Coast Guard's readiness to respond to a major spill occurring in Arctic waters. He will talk about the Coast Guard's polar icebreaker fleet and the challenges it faces. Caplis will discuss how long it would take the Coast Guard to deploy responders in the event of a spill, and will indicate what resources the Coast Guard might need to improve the speed and effectiveness of a response.

Biography:

In his current role, Captain John Caplis serves as the program manager for all-hazards preparedness and environmental response policy for the Coast Guard. He also serves as vice chair for the National Response Team, chairman of the Interagency Coordinating Committee on Oil Pollution Research, and executive steering committee member for the International Oil Spill Conference.

Most recently, Caplis served as the Deputy Commander for Coast Guard Sector Los Angeles – Long Beach. He oversaw all Coast Guard operations across 320 miles of Southern California coastline, including the protection of the nationally vital economic gateway of the ports of Los Angeles-Long Beach. Caplis also carried out the duties of the Alternate Captain of the Port, Federal Maritime Security Coordinator, Federal On-Scene-Coordinator and Officer in Charge, Marine Inspections. Caplis' past Coast Guard assignments include time afloat at sea, operational field tours in five major U.S. seaports, and two prior staff tours at Coast Guard Headquarters (CGHQ). He has broad operational field experience in oil spill and hazardous materials response, salvage operations, waterways management and environmental protection, search and rescue, vessel inspections, law enforcement, counter-narcotics, intelligence analysis and homeland security.

Caplis received his commission and a Bachelor of Science in Marine Science from the Coast Guard Academy. He also holds a Master of Public Administration in Environmental Management and Public Policy from George Mason University. Caplis' personal awards include three Meritorious Service Medals, three Coast Guard Commendation Medals, two Coast Guard Achievement Medals, and the Department of Transportation 9-11 medal.

EDWARD ITTA

Mayor, North Slope Borough, Alaska

Day 1, Panel 5: Response in the Arctic

Anticipated Focus:

Mayor Edward Itta will discuss his and his constituents' concerns about offshore drilling in the Chukchi Sea. In particular, he will discuss the concern he has expressed in public meetings that companies are not prepared to respond to a major spill, and that drilling is moving "too much, too soon, too fast." Itta will describe his community's reliance on the subsistence use of the area's natural resources, particularly whaling. He will also explain the importance of both scientific information and traditional environmental knowledge in contributing to an understanding of the Arctic ecosystem.

Biography:

Mayor Edward Itta is an Inupiat whaler and hunter. He is committed to protecting the Inupiat subsistence heritage and ensuring the long-term social and economic viability of all the communities of Alaska's North Slope. Itta was elected Mayor of the North Slope Borough in 2005 and re-elected in 2008.

He is a member of the federal Outer Continental Shelf Policy Committee, a member of the Barrow Whaling Captains Association, and a past commissioner of the Alaska Eskimo Whaling Commission. Itta also served as president of the North Slope Borough School Board and was vice-chairman of the federal subsistence advisory council for northern Alaska.

DR. DENNIS TAKAHASHI-KELSO

Executive Vice President, Ocean Conservancy

Day 1, Panel 5: Response in the Arctic

Anticipated Focus:

Dr. Dennis Takahashi-Kelso will discuss the risks of drilling and the challenges posed by spill response in the Arctic. Kelso will compare, in terms of response and impacts, the *Exxon Valdez* oil spill, the Deepwater Horizon spill, and a potential spill in the Arctic. Evaluating the state of science with respect to the Arctic, he will discuss the baseline data underlying scientists' understanding of the Arctic ecosystem and identify what remains unknown. Finally, based on his experiences during the *Exxon Valdez* oil spill, he will speak to ways to involve local communities in spill planning and response.

Biography:

Dr. Dennis Takahashi-Kelso leads the science and policy direction for Ocean Conservancy. Kelso's distinguished career has covered every aspect of ocean conservation, including public service in natural resources conservation, university teaching, research on fisheries, environmental policy and environmental grant-making. Most recently he served as the program officer for marine fisheries conservation at The David and Lucile Packard Foundation Executive. In that role, his responsibilities included strategy development and grant-making for fisheries conservation policy reforms and market interventions to encourage sustainable fishing and aquaculture. Prior to that, Kelso was a member of the faculty of Environmental Studies at the University of California, Santa Cruz, where his research examined changes in Pacific Coast fisheries, particularly as a result of the shift toward production of farm-raised rather than wild-caught salmon.

Before coming to California to pursue his doctorate at the University of California, Berkeley, Kelso had an extensive and industrious career in conservation in the state of Alaska, serving as Alaska Commissioner of Environmental Conservation, a member of Alaska Governor Steve Cowper's cabinet, Deputy Commissioner of Fish and Game, and director of the Alaska Division of Subsistence Hunting and Fishing. When the tanker *Exxon Valdez* went aground in 1989, spilling nearly 11 million gallons of crude oil into Prince William Sound, Kelso directed the state's oversight of the cleanup and enforcement of environmental laws. He also served as chair of the Alaska Emergency Response Commission and a member of the Alaska Coastal Policy Council, the Alaska Land Use Council, and the Alaska Water Resources Board. In addition to his doctorate from the University of California, Berkeley, Kelso also holds a law degree from Harvard University.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Briefing Book

Continued in Part 2