September 15, 2010

Hand Delivered

The Honorable Lisa P. Jackson
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Ave, N.W.
Washington, D.C. 20460

Re: New Source Performance Standards and Greenhouse Gases

Dear Administrator Jackson:

We are a broad spectrum of business organizations, listed at the conclusion of this letter, who wish to respond to a letter you received recently from Sierra Club, Natural Resources Defense Council, and Environmental Defense Fund about regulation of greenhouse gas emissions under the Clean Air Act. Their August 20, 2010 letter demands that EPA promulgate New Source Performance Standards ("NSPS") for greenhouse gas emissions from power plants and other boilers and that EPA invoke Clean Air Act section 111(d) to require state plans to limit greenhouse gases emissions from existing sources, as well. We believe the August 20 demand letter misstates EPA's legal obligations and that promulgating NSPS and 111(d) regulations for greenhouse gases at this time would be unwise and, ultimately, counterproductive.

No court order requires EPA to promulgate NSPS for GHGs. One might infer incorrectly from the August 20 demand letter that EPA is obligated to promulgate NSPS for boilers limiting GHG emissions, because the U.S. Court of Appeals for the District of Columbia Circuit remanded the boiler NSPS to EPA in 2007, for further consideration in light of the Supreme Court's *Massachusetts v. EPA* decision. The remand order does not in any way require EPA to promulgate NSPS for GHG emissions from boilers, nor does it limit in any way EPA's discretion in deciding whether or not to promulgate such new NSPS limitations. In fact, the organizations that sent the August 20 demand letter moved the D.C. Circuit to "reverse and vacate EPA's determination that it does not presently have authority to regulate CO_2 emissions under Section 111 of the Clean Air Act," which the Court explicitly denied. EPA opposed that motion, stating that reversal and remand was "neither necessary nor appropriate."

EPA's opposition explained that the Supreme Court's *Massachusetts v. EPA* decision, while pertinent to the question of whether EPA should regulate GHG emissions through NSPS, did not address that question, noting further that to "date neither Massachusetts nor any other judicial decision has specifically addressed either the legal or policy aspects of the potential regulation of greenhouse gas emissions under section 111 of the Act…." That remains true today. Also, as the demand letter admits, the D.C. Circuit's remand did not set any deadline for EPA to reconsider setting NSPS for GHGs.

The Clean Air Act does not require EPA to promulgate NSPS emission limitations for GHGs. The August 20 demand letter claims that EPA must "comply with its legal obligation and promptly issue a standard under section 111 limiting greenhouse gas emissions from power plants." But EPA has no such legal obligation. Nothing in CAA section 111 requires that NSPS cover all pollutants emitted by a source, and EPA has never interpreted it that way. See, e.g., 74 Fed. Reg. 51,950, 51,957 (Oct. 8, 2009) ("The statutory scheme thus provides EPA with significant discretion to determine which pollutant(s) should be regulated under the NSPS."); *National Lime Ass'n v. EPA*, 627 F.2d 416, 426 (D.C. Cir. 1980) (observing that, while "lime plants were determined to be sources of nitrogen oxides, carbon monoxide and sulfur dioxide as well as particulates, standards of performance were proposed and ultimately promulgated only with respect to particulate matter."); 70 Fed. Reg. 9706, 9711 (Feb. 28, 2005) (declining to set limits for NO_x emitted by boilers smaller than 100 mmBTU/hr. heat input, based on current emission levels, available technologies, and costs).

The August 20 demand letter implies that your finding that emissions of GHGs from new light-duty motor vehicles may endanger health and welfare means that EPA is obligated to include emissions from GHGs in all NSPS. That is incorrect. In contrast to section 202(a)(1), which requires EPA to set standards for emissions of "any air pollutant" from new motor vehicles that, in the Administrator's judgment, cause or contribute to air pollution that "may reasonably be anticipated to endanger public health or welfare," section 111 contains no requirement that EPA include emission limitations in NSPS for all air pollutants that are emitted by a given source category, nor even all such pollutants that EPA determines may reasonably be anticipated to endanger public health or welfare. Compare CAA §§ 111(b)(1)(A), (f)(2)(B), (g)(2).

EPA should not be using the Clean Air Act in ways Congress never intended in order to require reductions in greenhouse gas emissions that Congress thus far has declined to impose. As you know, Congress has on numerous occasions failed to enact proposed legislation that would mandate significant reductions in GHG emissions. In the current Congress, it is clear that a majority of Senators are not willing to impose the huge economic burden on society that GHG legislation would produce, at a time when the country is still struggling to recover from the worst economic crisis since the Great Depression. It would be an inappropriate contradiction of that legislative intent for EPA now to impose GHG emission limitations on new and existing stationary sources through NSPS and section 111(d) requirements. (Even if EPA took only the first step dictated by the August 20 demand letter, EPA would be addressing, according to the letter, one-third of total U.S. greenhouse gas emissions, without congressional endorsement.)

Also, EPA and the Administration have in the past emphasized the importance of emission trading as a way to reduce the total cost of achieving a given level of GHG emission reductions. Without commenting on whether emission trading is in fact a desirable or necessary element of climate change legislation, we note that it would be inconsistent with EPA's prior pronouncements for EPA now to seek wholesale reductions in GHG emissions through a mechanism, NSPS, which addresses individual emission units at a facility and does not have any explicit provision authorizing emission trading.

NSPS and section 111(d) plans have major limitations as a way of reducing GHG emissions. Even if it were appropriate for EPA to embark on a program to impose substantial new limitations on GHG stationary source emissions where Congress has chosen not to, that does not mean that the existing CAA mechanisms are effective tools to achieve that goal. Because climate change mitigation is presumed to require reductions in GHG concentrations in the global atmosphere, there is no greater benefit to reducing GHG emissions from one source than from another, or even from domestic sources versus those in other countries. Virtually everyone agrees that stabilizing GHG concentrations in the global atmosphere would be an enormously costly proposition, and therefore it is particularly important that any GHG reductions be obtained in a cost-effective manner. NSPS, which by statute must be based on an evaluation of the best-performing emission control technology for a particular emission unit, do not incorporate any explicit consideration of whether the same or greater reduction in GHGs could be achieved at lower cost through other measures. Also, NSPS typically are expressed as uniform emission rates for every unit in a particular source category or subcategory, do not provide for consideration of site-specific factors or incorporate the flexibility necessary to minimize the cost of emission reductions on a global scale.

Moreover, since NSPS reflect the capabilities of technology at a given point in time, it may actually be counterproductive for EPA to establish NSPS now, at a time when technologies for reducing GHG emissions are just beginning to be developed. The August 20 demand letter claims that establishing NSPS emission limits for GHGs from boilers will "ease the burden on permitting authorities as they begin to establish BACT limits on greenhouse gases" in Prevention of Significant Deterioration permits. As you know, industry strongly objects to EPA's application of the PSD program to GHGs, which is currently subject to multiple petitions for review in the D.C. Circuit, and the court will be asked to stay those PSD rules pending a decision. Facilitating PSD permitting therefore is not, in our view, a valid justification for promulgating NSPS at this time. But even aside from that, given that we have just begun to consider ways to reduce GHG emissions, it is not necessarily true that setting new source standards at this time, which may then be relied upon in issuing PSD permits to a greater extent than site-specific considerations of opportunities to control GHGs at a particular source, would actually facilitate EPA's goal of producing GHG reductions through the PSD permit program. Moreover, since the August 20 demand letter asks that EPA agree to issue NSPS for utility boilers on the same schedule as the pending issuance of MACT standards for hazardous air pollutant emissions from such boilers (currently, proposal in March 2011 and promulgation in November 2011), there would be little opportunity for EPA to evaluate emerging technologies before promulgating the utility boiler NSPS.

The demand that EPA "commit to exercising its authority under section 111(d) in that same rulemaking proceeding" is even more problematic. If EPA were indeed to use its authority under section 111(d) to require states to submit plans to establish standards of performance for GHG emissions from existing utility boilers, and then from all types of boilers, and then from other types of sources subject NSPS, it would impose a huge administrative burden on states that already have told EPA they will be overwhelmed with PSD and Title V permitting obligations EPA is poised to impose for major sources of GHGs (much less responding to EPA's revision of most of the National Ambient Air Quality Standards and other initiatives).

Far from "leveling the playing field" and providing "a framework for integrated air quality planning and management that encourages prudent investments in strengthening our nation's clean energy economy," as the August 20 demand letter claims, embarking on a huge new, ad hoc program to control GHGs at existing sources would be a prescription for permitting deadlock, stifling innovation, burdening businesses with uncertainty, and discouraging investments in energy efficiency and clean energy. Section 111(d), which applies only to pollutants for which there is no National Ambient Air Quality Standard, has been a minor element of EPA's air pollution control program. But now it would become the primary means of regulating stationary source GHG emissions, with potentially different (and currently unpredictable) approaches being taken by all 50 states. Moreover, it would cement in place a best-technology approach to mitigating GHG emissions from stationary sources, rather than an approach of seeking the most cost-effective measures to achieve a desired reduction. The nation cannot afford such an approach, even if EPA and the states had the resources to implement it.

EPA should reject the demand to embark on a huge new regulatory program that is neither legally required nor capable of being implemented adequately. Both your agency and our industries face tremendous challenges in the next few years. EPA staff already are stretched thin dealing with a vast array of air pollution issues, including numerous other rulemakings that EPA acknowledges will impose tens of billions of annual costs, not to mention initiatives underway to address climate change. State and local regulators are facing unprecedented burdens to try to implement all these new requirements, as we know they have expressed to you. Unemployment remains near 10% and the economy is moving unsteadily towards recovery. Under these circumstances, EPA should not be embarking on a demanding new set of rulemakings, aiming to impose comprehensive, but as yet unpredictable, GHG emission limitations on a vast number of stationary sources, especially when it is under no legal obligation to do so and it would be acting to impose a regulatory program that Congress has declined to adopt.

The August 20 demand letter threatens that, if EPA does not agree, by September 15, 2010, "to include greenhouse gases in its upcoming NSPS and to coordinate these measures with the forthcoming MACT rulemaking for utility boilers," and also "commit to exercising its authority under section 111(d) in that same rulemaking proceeding," Sierra Club, NRDC, and Environmental Defense Fund will seek an order from the D.C. Circuit compelling EPA action on the 2007 remand order. The organizations listed below are intervenors in that D.C. Circuit case, and they intend to oppose any such motion, protecting EPA's right to address potential further regulation of GHG emissions on the schedule and in the manner that EPA, in light of all its other regulatory initiatives and resource demands and its legal and policy considerations, determines.

The business organizations listed below support environmental regulations that protect health and the environment without unnecessarily hobbling industry and the U.S. economy. We plan to seek a meeting with Assistant Administrator McCarthy to discuss further the concerns expressed in this letter. In the meantime, if you or your staff have any questions or wish to discuss the issues addressed in this letter further, please contact our counsel in this matter, Russell S. Frye, at 202-572-8267 or rfrye@fryelaw.com.

Sincerely,

American Chemistry Council
American Forest & Paper Association
American Iron and Steel Institute
Business Roundtable
Corn Refiners Association
Council of Industrial Boiler Owners
National Oilseed Processors Association
National Petrochemical and Refiners Association
Society of Chemical Manufacturers and Affiliates

cc: Asst. Admin. Gina A. McCarthy

ORAL ARGUMENT NOT YET SCHEDULED

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

COALITION FOR RESPONSIBLE REGULATION, INC., ET AL., Petitioners v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY Respondent.	No. 10-1092 (consolidated with Nos. 10-1094, 10-1134, 10-1143, 10-1144, 10-1152, 10-1156, 10-1158, 10-1159, 10-1160, 10-1161, 10-1162, 10-1163, 10-1164, 10-1166, 10-1172, and 10-1182)

INTERVENORS ALLIANCE OF AUTOMOBILE MANUFACTURERS' AND ASSOCIATION OF INTERNATIONAL AUTOMOBILE MANUFACTURERS' OPPOSITION TO MOTIONS FOR STAY

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The Alliance of Automobile Manufacturers and the Association of International Automobile Manufacturers (collectively, "Auto Intervenors") respectfully submit this opposition to the motions for stay of the final rule of the United States Environmental Protection Agency ("EPA"), "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule," 75 Fed. Reg. 25,324 (May 7, 2010) (the "Tailpipe Rule").

I.
INTRODUCTION

Beginning in January 2009, the Obama Administration worked closely with the State of California, environmental organizations, and the automobile industry to construct a framework for a coordinated "Joint National Program" that would address motor vehicle greenhouse gas ("GHG") emissions and fuel economy. This coordination was necessary because motor vehicle fuel economy and GHG emissions largely overlap, as there is an inverse mathematical relationship between emissions of the principal GHG (carbon dioxide, or CO2), measured in grams of CO2 emitted per mile, and fuel economy, measured in miles per gallon of gasoline consumed. The Joint National Program was created by the Tailpipe Rule and separate fuel economy regulations adopted by the National Highway Traffic Safety Administration ("NHTSA").

The Joint National Program allows manufacturers to comply with a harmonized national program rather than—as was the case before and could likely

be again if the Tailpipe Rule is stayed—a patchwork of federal standards and separate state standards that had been promulgated by California and adopted by 13 other states. In a system where the federal standards apply in one group of states and state standards apply in a second group of states, a manufacturer would have to sell one fleet of vehicles that achieves X miles per gallon to comply with the federal standards, and a separate fleet of vehicles that achieves Y miles per gallon to comply with the state standards. Doing so imposes significant compliance burdens and costs. The Joint National Program relieves manufacturers from such a patchwork, and allows them instead to meet a single set of standards nationwide.

Petitioners/movants are entities concerned about EPA regulations aimed at controlling stationary-source (*i.e.*, factory or utility) emissions of GHGs. They have attacked four separate EPA rules. Their complaint with the Tailpipe Rule has nothing to do with its regulatory substance as applied to mobile sources, but rather with its collateral consequences for regulation of stationary sources under separate rules.[1] Yet, two of the motions for stay—filed by the State of Texas and the Coalition for Responsible Regulation, *et al.* ("CRR")—seek to stay the Tailpipe Rule's effects not only as to these other stationary source rules but also as to

[1] Auto Intervenors have intervened only in the cases challenging the Tailpipe Rule.

mobile sources. Such an overbroad stay would, as explained below, avoid no harm to stationary-source emitters while causing substantial harm to automobile manufacturers, who, weeks away from the commencement of the first model year regulated by the Joint National Program (2012), would likely have to switch production and sales plans entirely to comply with a resultant patchwork of overlapping and contradictory state and national standards.

The third motion for stay, filed by the National Association of Manufacturers ("NAM") *et al.*, takes a narrower approach. NAM proposes that the Tailpipe Rule be *partially* stayed, that is, solely as to its effects on stationary sources, with the Rule left intact insofar as it regulates mobile sources. To the extent that such a partial stay is necessary and appropriate to redress the complained-of harm to the stationary-source emitters, it would do so without substantially harming automobile manufacturers, dealers, and auto-buying consumers.

Auto Intervenors defer to Respondent EPA's arguments why the movants have failed to meet the heavy burden of showing that they are entitled to a stay. If, however, this Court is inclined to grant any stay, Auto Intervenors submit that this Court should exercise its discretion and grant a stay that is no broader than the approach proposed by NAM *et al.*

II.
THE TAILPIPE RULE PROVIDES SIGNIFICANT BENEFITS TO THE AUTOMOBILE INDUSTRY

The Tailpipe Rule constitutes one half of the rulemaking adopted jointly by EPA and NHTSA to establish coordinated motor vehicle GHG emission standards and fuel economy standards for the 2012 through 2016 model years. *See* 75 Fed. Reg. 25,324 (May 7, 2010). These rules were the first of their kind, and resulted from an intensive cooperative effort between the Obama Administration, the State of California, environmental organizations, and the automobile industry.

Articulating the significant benefits provided by the Joint National Program to the auto industry, Carol M. Browner, Assistant to the President for Energy and Climate Change, proclaimed at its announcement that the Program "is not only good news for consumers who will save money at the pump, but this policy is also good news for the auto industry which will no longer be subject to a costly patchwork of differing rules and regulations."[2] The adoption of the Joint National Program meant that vehicle manufacturers would no longer be required to comply with a complex morass of multiple and inconsistent regulations governing motor

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[2] *See* Office of the Press Secretary, *President Obama Announces National Fuel Efficiency Policy* (available at http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/) (last accessed on October 27, 2010).

vehicle fuel economy and greenhouse gas emissions that had arisen at both the state and the federal level.

A. Before The Enactment Of The Joint National Program, Automobile Companies Were Facing Multiple And Inconsistent Fuel Economy And Carbon Dioxide Emission Regulations

Historically, the regulation of motor vehicle fuel economy has been the sole province of the federal government. Since 1978, Corporate Average Fuel Economy ("CAFE") standards have been established by NHTSA under the Energy Policy and Conservation Act of 1975, 49 U.S.C. §§ 32901, *et seq*. ("EPCA"). These fuel economy standards effectively regulate carbon dioxide emissions because "[f]uel consumption and CO2 emissions from a vehicle are two 'indissociable' parameters" such that "fuel economy is directly [inversely] related to emissions of greenhouse gases such as CO2." *See* Average Fuel Economy Standards For Light Trucks Model Years 2008-2011, 71 Fed. Reg. 17,566, 17,659 (Apr. 6, 2006). Given the direct inverse relationship, it is possible to translate a fuel-economy standard into a CO2 emissions standard, and vice versa, through fairly simple mathematical calculations.

The CAFE standards provide manufacturers with flexibility because they do not set fuel economy requirements that must be met by each individual vehicle, but rather are based on the average fuel economy of vehicles sold throughout the country by an individual manufacturer. 49 U.S.C. § 32902. Congress adopted this

nationwide fleet-average approach to "ensure wide consumer choice" by leaving "maximum flexibility to the manufacturer" to produce a "diverse product mix" while meeting the applicable nationwide CAFE standards. S. Rep. No. 94-179, at 6 (1975); *Center for Auto Safety v. NHTSA*, 793 F.2d 1322, 1338, 1339 (D.C. Cir. 1986). This flexibility is extremely important to manufacturers because the market demands of consumers in a particular state or geographic area can vary significantly across the county. The approach of nationwide fleet averaging enables manufacturers to sell different mixes of vehicles in various states or regions as long as the nationwide fleet complies with the applicable standards. *See, e.g.,* Declaration of Michael Love (National Manager of Regulatory Affairs for Toyota Motor Sales, U.S.A., Inc.) ¶ 15; Declaration of Sarah C. Hiple (Program Manager, Regulatory Compliance at Nissan North America, Inc.), ¶ 7.

Despite the federal government's long history of regulating of motor vehicle fuel economy (and resulting CO2 emissions) in this manner, the State of California decided that it wanted to do more to address global climate change, and in 2002 the California legislature enacted Assembly Bill 1493, *see* Cal. Health & Safety Code § 43018.5, directing the California Air Resources Board ("CARB") to adopt regulations aimed at reducing greenhouse gas emissions from new passenger cars and light trucks. Pursuant to this mandate, CARB promulgated regulations in 2004 requiring that each manufacturer's fleet of cars and light trucks sold in California

meet increasingly stringent GHG emission standards that phase in between the 2009 and 2016 model years, *see* Cal. Code Regs. tit. 13, § 1961.1. California subsequently sought a waiver of Clean Air Act preemption from EPA under 42 U.S.C. § 7543(b), as it (alone among the states) is entitled to do for vehicle emissions standards. California's standards for the 2012 through 2016 model years were significantly more stringent than the then-applicable CAFE standards, and effectively required manufacturers to produce a separate fleet of high fuel economy vehicles just for the California market. For instance, CARB expected that manufacturers would have to design vehicles that incorporated "technology packages" that would increase fuel economy and thereby reduce CO2 emissions. *See Staff Report: Initial Statement of Reasons* ("ISOR") at 59, 63-67 (available at http://www.arb.ca.gov/regact/grnhsgas/isor.pdf) (last accessed Oct. 27, 2010).

Thirteen other states and the District of Columbia subsequently adopted the California regulations under Section 177 of the Clean Air Act, 42 U.S.C. § 7507 (allowing other states to adopt California's vehicle tailpipe emissions regulations that receive a waiver from EPA), thus requiring the motor vehicle fleets sold in those jurisdictions—some with exceptionally small vehicle fleets—also to meet these new stringent California standards based on the vehicles sold in each state. Consequently, for the first time, manufacturers were faced with having to balance not only their national fleets of vehicles for CAFE compliance, but also 14 separate

state fleets—one each in California and the 13 Section 177 States—to comply with fuel economy and GHG regulations.

B. State GHG Emissions Regulations Would Impose Significant New Compliance Burdens On Automobile Companies

Having to comply simultaneously with these state and federal laws—what NHTSA has called a "patchwork of state and federal rules governing fuel economy and GHG emissions that were inadequate, uncertain, potentially conflicting, and in a constant state of flux"[3]—threatened to saddle manufacturers with tremendous costs and compliance burdens. In addition to imposing much more stringent standards and a compliance framework that is entirely different from federal regulations, implementing the California GHG Regulations would deprive manufacturers of the flexibility of nationwide fleet-averaging provided under the CAFE program. Balancing the smaller and more homogeneous fleets found in each of California and the Section 177 states is inherently more difficult and costly than it is to balance a fleet across the entire nation. *See* Declaration of R. Thomas Brunner (Manager of Vehicle Compliance and Analysis at Mercedes-Benz, USA, LLC) (filed separately under seal), ¶ 9; Hiple Decl., ¶ 8. Moreover, because the

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[3] *See* Letter from O. Kevin Vincent to Office of Senator Diane Feinstein (Feb. 19, 2010) (available at http://media.washingtonpost.com/wp-srv/special/climate-change/documents/post-carbon/NelsonLetter022510.pdf) (last accessed Oct. 27, 2010).

California GHG Regulations would have been applied on a state-by-state basis based on the mix of vehicles sold in each state, their effective stringency would vary widely between different states, depending on customer preferences and the resultant compliant product mix necessarily sold in each of these states. Love Decl., ¶ 7. Manufacturers were therefore faced with the possibility of having to develop different product and technology plans for each state, thus severely complicating vehicle distribution throughout the country. *Id.*

Adjusting to an entirely new regulatory regime requires extensive lead time, and manufacturer product and distribution plans are therefore set many years in advance of a particular model year. Love Decl., ¶ 9; Declaration of Reginald R. Modlin (Director of Regulatory Affairs at Chrysler Group, LLC), ¶ 6. Indeed, the need for this lead time is recognized in both EPCA and the Clean Air Act. Under EPCA, CAFE standards must be established at least 18 months before the beginning of the applicable model year, and Section 177 of the Clean Air Act requires that state emission standards be adopted at least two years before the start of the applicable model year. Because the fuel economy of (and the resulting GHG emissions from) a motor vehicle goes to the very heart of its design and manufacture, the industry has long sought a uniform, nationwide approach to regulating these matters that provides the regulatory certainty needed for advance product planning.

The automobile industry therefore challenged the California GHG Regulations on federal preemption grounds. *See Green Mountain Chrysler Plymouth Dodge v. Crombie*, 508 F.Supp.2d 295, 342 n.49 (D. Vt. 2007), *Central Valley Chrysler-Jeep, Inc. v. Goldstene*, 529 F. Supp. 2d 1151, 1158 (E.D. Cal. 2008). The industry also opposed California's request to EPA for a waiver of Clean Air Act preemption. As of 2009, the outcome of these challenges was still undecided, and there was consequently uncertainty concerning whether the industry would have to comply with the California GHG Regulations. District court decisions rejecting the industry's preemption challenges were on appeal, and EPA was reconsidering its earlier decision denying California's waiver request. *See* California State Motor Vehicle Pollution Control Standard, 74 Fed. Reg. 7,040 (Feb. 12, 2009).

C. The Joint National Program Resolved These Conflicts And Provided The Industry With A Single Set Of Fuel Economy And Greenhouse Gas Emission Standards Set At The Federal Level

The Joint National Program resolved this regulatory uncertainty and provided the automobile industry with a uniform, nationwide approach to regulating fuel economy and GHG emissions. The development of this Program was announced at a White House Rose Garden ceremony on May 19, 2009, and the various stakeholders signed "Commitment Letters" outlining its broad contours. Under this Program, EPA and NHTSA adopted coordinated regulations

establishing motor vehicle fuel economy and GHG emissions standards, and, starting with the 2012 model year, California and the Section 177 States modified their regulations to provide that compliance with the federal standards is deemed to satisfy compliance with the state standards. For its part, the automobile industry agreed to dismiss pending challenges to state GHG regulatory programs.

Contrary to the movants' argument, EPA's Tailpipe Rule and NHTSA's CAFE standards are not "redundant." CRR Br. 46. For the Court's purposes, the key difference is that California's regulations defer to compliance with the federal GHG program adopted by EPA, but they do not defer to compliance with the federal CAFE program (see Section III.B, *infra*). So a stay of the federal GHG regulations raises the prospect of renewed enforcement of state-by-state GHG standards, even if the CAFE program remains in place. *See also* Respondent's Br. 13 (Respondent's description of differences between EPA's GHG program and NHTSA's CAFE program).

III.
THE BALANCING OF THE EQUITIES WEIGHS HEAVILY AGAINST STAYING THE IMPLEMENTATION OF THE TAILPIPE RULE

A. If A Stay Is Warranted, It Should Be Narrowly Tailored To Redress The Complained-Of Harm Without Unnecessarily Causing Substantial Harm To Other Parties

This Court considers four factors when determining whether to grant a stay pending review: "(1) the likelihood that the moving party will prevail on the

merits; (2) the prospect of irreparable injury to the moving party if relief is withheld; (3) the possibility of substantial harm to other parties if relief is granted; and (4) the public interest." D.C. Cir. R. 18(a)(1); *accord* D.C. Cir. Handbook of Practice & Internal Procedures 33 (2010) (citing *Wash. Metro. Area Transit Comm'n v. Holiday Tours, Inc.*, 559 F.2d 841 (D.C. Cir. 1977); *Va. Petroleum Jobbers Ass'n v. Fed. Power Comm'n*, 259 F.2d 921 (D.C. Cir. 1958)). Thus, before granting a stay, this Court "must balance the competing claims of injury and must consider the effect on each party of the granting or withholding of the requested relief." *Winter v. Natural Resources Defense Council, Inc.*, 129 S.Ct. 365, 376 (2008) (internal quotation marks omitted).

A stay, like other types of injunctions, "must be narrowly tailored to remedy the specific harm shown." *State of Nebraska Dep't of Health & Human Servs. v. Dep't of Health & Human Servs*., 435 F.3d 326, 330 (D.C. Cir. 2006) (internal quotation marks omitted); *accord Nat'l Treasury Employees Union v. Yeutter*, 918 F.2d 968, 977 (D.C. Cir. 1990). Consistent with these principles, this Court has granted partial stays pending appeal. *See, e.g.*, *Consumer Fed. of Am. v. U.S. Dep't of Health & Human Servs.*, 83 F.3d 1497, 1500 (D.C. Cir. 1996); *Common Cause v. Nuclear Regulatory Comm'n*, 674 F.2d 921, 925-26 (D.C. Cir. 1982); *W. Union Telephone Co. v. F.C.C.*, 665 F.2d 1112, 1116-17 (D.C. Cir. 1981).

Respondent has offered a number of arguments as to why a stay should be denied, including arguments with respect to Movants' likelihood of success on the merits and with respect to the possibility of irreparable harm if a stay were to be denied. Auto Intervenors will not recapitulate those arguments here. If, however, this Court is inclined to grant a stay, the stay should, as explained below, be narrowly tailored solely to stationary-source effects of the Tailpipe Rule. Such a narrowly tailored stay will redress the harm about which petitioners complain, while avoiding the substantial harm that may be caused if the Tailpipe Rule were stayed as to mobile sources.

Specifically, a broader stay could disable the Joint National Program that was adopted so that automobile manufacturers could comply with a single set of coordinated national standards. As declarants from six automobile manufacturers have stated in the declarations attached hereto or filed separately under seal, if the Tailpipe Rule were to be stayed and if manufacturers were consequently required to comply with the California GHG Regulations in addition to the federal CAFE program, they would be facing significant additional compliance burdens and costs. With the first regulated model year (2012) mere weeks away[4] and with manufacturers having made extensive compliance plans focused on the Joint

[4] A model year can begin as early as January 2 of the previous calendar year.

National Program's standards, substantial harm would be caused to manufacturers and consumers were an overbroad stay granted and manufacturers suddenly forced to comply with both state and national standards.

B. Staying The Implementation Of The Tailpipe Rule Would Result In Significant Harm To The Automobile Industry.

Staying the implementation of the Tailpipe Rule would result in significant harm to the auto industry because, as NHTSA recently pointed out, without it, manufacturers face the significant risk that "California and the States that adopted the California standards could move forward to enforce standards that are inconsistent with the Federal standards, thus creating confusion, encouraging renewed litigation, and driving up the cost of compliance to automobile manufacturers and consumers alike." Letter from O. Kevin Vincent to Office of Senator Diane Feinstein (Feb. 19, 2010), *see* note 3, *supra*.

This outcome results from the manner in which California amended its regulations to allow for the national compliance option. When the Joint National Program was adopted, the California regulations were amended to provide that "[f]or the 2012 through 2016 model years, a manufacturer may elect to demonstrate compliance with [the California GHG Regulations] by demonstrating compliance with the National greenhouse gas program." Cal. Code Regs. tit. 13, § 1961.1(a)(1)(A)(ii). The term "National greenhouse gas program" is defined as "the national program that applies to new 2012 through 2016 model year passenger

cars, light-duty trucks, and medium-duty passenger vehicles as proposed by the U.S. Environmental Protection Agency at 74 Fed. Reg. 49454 (September 28, 2009) and adopted by EPA on April 1, 2010 …'" *Id.* § 1961.1(e). Thus, the literal language of the California regulations can be read as making the implementation of the Tailpipe Rule a necessary prerequisite for manufacturers to qualify for the national compliance option to satisfying the California regulations.

Losing the national compliance option would have significant negative consequences for the industry. The 2012 model year can begin as early as January 2, 2011, and manufacturer product and distribution plans for that model year are already set in stone. *See* Declaration of Robert Bienenfeld (Senior Manager of Environment and Energy Strategy at American Honda Motor Co., Inc.), ¶ 13; Love Decl., ¶ 19; Modlin Decl., ¶ 10; Declaration of Brian Rampp (Vice President - Delegate Corporate Strategy for Environment and Transportation at BMW of North America, LLC) (filed separately under seal), ¶ 11. Indeed, the 2013 model year is just over a year away, and given the industry's inherent need for lead time, manufacturers have already determined how many of each 2013 model vehicles they intend to produce and sell based on the requirements of the Joint National Program; planning for the 2014 model year is also well underway. Love Decl., ¶ 19; Rampp Decl., ¶ 7. Relying on the implementation of the Joint National Program, manufacturers have developed national distribution, marketing,

and sales plans. Love Decl., ¶ 19; Brunner Decl., ¶ 10; Bienenfeld Decl., ¶ 14. If the industry were to be deprived of the national compliance option accorded by the Tailpipe Rule, then manufacturers would stand to lose this investment because they would suddenly have to overhaul their product and distribution plans to comply with the GHG Regulations in California and the Section 177 States. Brunner Decl., ¶ 11.

Moreover, the standards that would be imposed in California and the Section 177 States are more stringent than the GHG emissions that would be allowable under the federal program. For example, the federal standard for the 2012 model year equate to a GHG emission rate of 295 grams per mile for the combined car and light truck fleet, and a fuel economy of 29.7 mpg. In contrast, the California program would require a GHG emission rate for the combined car and light truck fleet of 271 g/mi and an equivalent 32.4 mpg. *Compare* 75 Fed. Reg. at 25,330-331 *with* Comparison of Greenhouse Gas Reductions for the United States and Canada Under U.S. CAFE Standards and California Air Resources Board Greenhouse Gas Regulations at 8 (available at http://www.arb.ca.gov/cc/ccms/reports/pavleycafe_reportfeb25_08.pdf) (last accessed Oct. 27, 2010). Some manufacturers have determined that they would find it extremely difficult to meet the California standards with their planned fleets, and accordingly they might have to restrict sales of models with lower fuel

economy in California and the Section 177 States. *See, e.g.,* Love Decl., ¶ 20; Modlin Decl., ¶¶ 20-21.

Finally, because of structural differences between the California GHG Regulations and the federal CAFE program, having to comply with both would greatly increase manufacturers' compliance burdens. For instance, owing to recent changes in the CAFE program, the federal CAFE standards are based on a "footprint" approach. Under this approach, a fuel economy "target" is established for each model of vehicle based on the model's "footprint," which is calculated by multiplying the vehicle's track width (the distance between the centerline of the tires) and wheelbase (the distance between the centers of the axles). Pursuant to the formula, models with a smaller "footprint" will have a higher, more stringent, fuel economy target, and models with a larger "footprint" will have a lower target. The California regulations do not employ the footprint approach, but instead establish a single fuel economy standard that is applicable to each of the two classifications of vehicles and that each manufacturer must meet, no matter the footprint. Being forced to comply with both of these differing schemes would impose additional costs on manufacturers. *See* Brunner Decl., ¶ 7; Hiple Decl., ¶ 11. After developing plans to comply with the Tailpipe Rule for the upcoming model year based on the footprint approach, manufacturers would have to develop

a separate compliance plan for California using a completely different metric. *See* Brunner Decl., ¶ 7; Love Decl., ¶ 21.

Accordingly, movants' statement that "no one will be harmed by the stay," *see* CRR Br. 79, is simply and patently incorrect and betrays movants' ignorance of the Tailpipe Rule's importance to the automobile industry. Declarants from six manufacturers have attested to the fact that staying the implementation of the rule would result in tremendous hardship to their companies.

C. Denying The Stay Or Imposing A Partial Stay Avoids Harm To The Automobile Industry.

The above-described harms to the automobile industry from a stay of the Tailpipe Rule as to mobile sources can be avoided by denying the requested stay. If the Court were inclined to grant some form of relief, then the above-described harms could be avoided by imposing the more limited stay advocated by the NAM Movants. The purported harms that Texas and the CRR Movants (as well as the NAM Movants) have identified flow exclusively from the effect of the application of the challenged rules to *stationary sources*. *See* Texas Motion at 29-42; CRR Motion at 61-68. No party has identified any harm—let alone irreparable harm—attributable to the application of the Tailpipe Rule to *mobile sources*. As one Petitioner succinctly put it: "The problem occurs on the stationary source side …." Peabody Energy Co.'s Response In Support Of Motions For Stay at 5 (Sept. 30, 2010). Accordingly, any stay of the Tailpipe Rule should be limited to its effect on

stationary sources. *See, e.g.*, *State of Nebraska*, 435 F.3d at 330; *Nat'l Treasury Employees Union*, 918 F.2d at 977.

Indeed, the NAM Movants—which represent many of the stationary sources that would be regulated under regulations supposedly triggered by the Tailpipe Rule—have demonstrated that it is not necessary to stay implementation of the Tailpipe Rule with respect to mobile sources to prevent the alleged harms to stationary sources.[5] They request that "this Court issue a narrowly tailored partial stay to preserve the status quo and prevent these rules from taking effect on countless stationary sources that EPA has not assessed, while allowing EPA to proceed with its CAA efforts to control GHG emissions from cars and light duty trucks." NAM Br. 1-2. Unlike the other stay movants, the NAM Movants implicitly recognize that a full stay of the Tailpipe Rule would disrupt EPA's regulation of GHG emissions from mobile sources. The NAM Movants also recognize that their proposal would preserve the status quo of (i) the Joint National

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[5] The NAM Movants do not seek to stay EPA's Endangerment Finding because the relief they seek for stationary-source emitters can be granted while keeping that finding intact. The Endangerment Finding does not by itself impose any obligations on any party, but rather is a prerequisite to EPA's regulation of GHG emissions under the Clean Air Act. If this Court is inclined to stay the Endangerment Finding based on harms to stationary-source emitters, the Court should grant only a partial stay of that Finding insofar as it is applicable to direct regulations of stationary sources (along the lines of the partial stay suggested by the NAM Movants with respect to the Tailpipe Rule).

Program for mobile sources (which is already in place and around which the industry has made compliance and product plans years into the future) and (ii) no new regulation for stationary sources (which have not yet been subjected to new regulation triggered by the Tailpipe Rule). *See* NAM Br. 12 (partial stay would "enable EPA to realize its goals of imposing GHG emission limits on cars while preserving the status quo for stationary sources").

IV.
CONCLUSION

This Court should deny any stay of the Tailpipe Rule. Alternatively, if this Court is inclined to grant a stay of the Tailpipe Rule, it should limit that stay to the regulatory effects of the Tailpipe Rule on stationary sources.

Date: November 1, 2010

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that, on this 1st day of November, 2010, the foregoing Opposition to Motions to Stay was electronically filed with the United States Court of Appeals for the District of Columbia via the Court's Electronic Case Filing System.

Participants in the case who are registered CM/ECF users will be served by the appellate CM/ECF system. I also hereby certify that on November 1, 2010, I served one copy of the foregoing motion by First-Class Mail, postage prepaid, for delivery to the following non-CM/ECF participants:

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LIST OF RECENT AND PENDING EPA REGULATIONS
UNDER THE CLEAN AIR ACT

This chart lists Clean Air Act (CAA) rulemakings initiated or finalized by the Obama Administration, as well as pending rulemakings identified by the Environmental Protection Agency (EPA) as currently under development. The chart is based on EPA's rulemaking documents and seeks to list the rulemakings in order of compliance costs based on EPA's own estimates. For rulemakings for which EPA has not yet provided specific cost estimates or has concluded cost estimates were not required, the rulemakings are listed in chronological order of the regulatory action.

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
1	Reconsideration of the 2008 Ozone National Ambient Air Quality Standards (Proposed)	Final rule projected November 2010	$19-$90 billion per year in 2020 ($2006). (RIA page S1-4, S2-3 and EPA fact sheet).	Proposes to lower National Ambient Air Quality (NAAQS) standards for ground-level ozone (from 1997 level 0.08 ppm/2008 level of 0.075 ppm) to between 0.070 and 0.060ppm, and to set a separate secondary standard to protect vegetation and ecosystems. Also proposes to accelerate the schedule for states to designate areas that do not meet the new standards.	EPA projects 77% of counties that currently have ozone monitors would violate a 0.070 parts per million (ppm) standard in 2020, and 96% of those counties would violate a 0.060 ppm standard. Rule will require states with areas determined to be in non-attainment with the new standards to prepare state implementation plans to come into compliance through emissions control programs. The majority of emissions sources of man-made nitrogen oxides and volatile organic compounds emissions, which contribute to ground-level ozone formation, are mobile sources, industrial processes (which include consumer and commercial products), and the electric power industry. Other emissions sources

					include agricultural sources.
2	Light-duty vehicles greenhouse gas emissions Standards and Corporate Average Fuel Economy Standards (Final)	Final rule published May 7, 2010	EPA and DOT estimate compliance costs **between $51.5 billion and $51.8 billion** for all MY 2012-2016 vehicles over full lifetime of vehicles projected to be sold during model years 2012-2016 ($2007).	Sets greenhouse gas emissions (GHG) and fuel efficiency standards for new passenger cars and trucks for MY 2012-2016 vehicles. President Obama has directed agencies to develop more stringent standards for MY 2017-2025 vehicles.	Rule affects companies that manufacture or sell new light-duty passenger cars and trucks. Regulated categories and entities include: Motor vehicle manufacturers; and commercial importers of vehicles and vehicle components. EPA estimates average cost increases per vehicle to increase from $331 per car or truck in 2012 to $948 per vehicle in 2016.
3	National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial & Institutional Boilers and Process Heaters (Proposed)	Final rule projected December 2010	**$9.5 billion in capital expenditures; $3.2 billion in annual costs (reduced to $2.9 billion due to fuel savings).** (75 Fed. Reg. 32037, Regulatory Impact Analysis)	Proposes to set emissions standards for hazardous air pollutants (e.g., particulate matter, hydrogen chloride, mercury) for boilers and process heaters located at major sources. Standards for major sources will be based on the maximum achievable control technology (MACT).	Rule will affect owners and operators of industrial, commercial or institutional boilers and process heaters at a major source. Potentially regulated categories and entities include: Extractors of crude petroleum and natural gas; Manufacturers of lumber and wood products, chemicals, coal products, rubber and miscellaneous plastic products, motor vehicle parts and accessories; pulp and paper mills; petroleum refineries; steel works, blast furnaces; electric, gas, and sanitary services; health and

					educational services.
4	Primary National Ambient Air Quality Standards for Nitrogen Dioxide (Final)	Final rule published February 9, 2010	**$3.6 billion in 2020** ($2006). Because this analysis considers only counties that currently have NO2 monitors, EPA advises that the possibility exists that, as the new monitoring network is installed, there may be more potential nonattainment areas than analyzed in the RIA. (Final Regulatory Impact Analysis ES-1, ES-6)	Supplements national standards for nitrogen dioxide (NO2) by establishing a new short-term (1-hour) daily maximum standard of 100 parts per billion (ppb), and establishes new monitoring requirements.	Rule will require states with areas determined to be in non-attainment with the new standard to prepare state implementation plans to meet the new standards. States will need to identify and implement air pollution control measures to reduce ambient NO2 concentrations, most likely by requiring air pollution controls on sources that emit oxides of nitrogen. While NOx is emitted from a wide variety of source types, the top three categories of sources of NOx emissions are on-road mobile sources, electricity generating units, and non-road mobile sources (75 Fed. Reg. 34406).
5	National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers (Proposed)	Projected date for final rule publication December 2010	**Total capital costs of approximately $2.5 billion and $1 billion in total annualized costs** (75 Fed.	Proposes to set emission limits for coal-fired, biomass-fired and oil-fired types of boilers located at area sources in order to reduce emissions of a number of toxic air pollutants including mercury, metals, and organic air toxics. The	Rule will affect owners and operators of industrial, commercial and institutional boilers located at area sources. The "industrial" category includes boilers used in manufacturing, processing, mining, refining, and any other industry.

			Reg. 31914). EPA Fact Sheet	standards for area sources must be technology-based on either generally available control technology or maximum achievable control technology. Exempts natural gas-fired area source boilers.	The "commercial" category include boilers used in stores/malls, laundries, apartments, restaurants, and hotels/motels. The "institutional" category includes boilers used in medical centers (e.g. hospitals, clinics, nursing homes), educational and religious facilities (e.g. schools, universities, churches), and municipal buildings (e.g. courthouses, prisons).
6	Transport Rule (CAIR Replacement Rule); Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Proposed)	NPRM comment period closes October 2010	**$3.7 billion in 2012 and $2.8 billion in 2014** (preferred remedy option; $2006). (75 Fed. Reg. 45348, 45352). Costs for the agency's alternative proposed approach would be $4.2 billion in 2012 and $2.7 billion in 2014.	Proposes to limit interstate transport of emissions of nitrogen oxides and sulfur dioxide within 32 states in the eastern United States that affect the ability of downwind states comply with the 1997 and 2006 fine particulate matter NAAQS and 1997 ozone NAAQS. An initial phase of emissions reductions would be required by 2012. A second phase of reductions would be required by 2014. Sunsets CAIR; sets forth EPA's preferred replacement approach and seeks comment on two alternative approaches. Each approach would set a pollution limit (or budget) for each state and obtain reductions from power plants. EPA's preferred approach would allow	Rule will affect electric generating facilities (power sector), including utilities (electric, natural gas, other systems).

				intrastate trading and some interstate trading among power plants.	
7	Emissions Controls for new Marine Diesel engines at or Above 30 Liters per Cylinder (Final)	Final rule published June 2010	**$1.85 billion in 2020, increasing to $3.11 billion in 2030** (2006 $). (75 Fed. Reg. 22939, Program Costs Fact Sheet)	Places emissions standards on Category 3 engines in order to reduce their emissions of PM2.5, SOX, and NOX that contribute to nonattainment of the NAAQS for PM2.5 and ground-level ozone. Standards apply in two stages—near-term standards for newly built engines will apply beginning in 2011; long-term standards requiring an 80 percent reduction in NOX emissions will begin in 2016. Also finalizes change to diesel fuel program that will allow for production and sale of 1,000 ppm sulfur fuel for use in Category 3 marine Vessels; generally forbids the production and sale of other fuels above 1,000 ppm sulfur for use in most U.S. waters, unless alternative devices, procedures, or compliance methods are used to achieve equivalent emissions reductions. Makes technical amendments to motor vehicle and nonroad engine regulations in recently finalized rule for new nonroad spark-ignition engines.	Rule affects companies that manufacture, sell, or import into the United States new marine compression ignition engines with per cylinder displacement at or above 30 liters for use on vessels flagged or registered in the United States; companies and persons that make vessels that will be flagged or registered in the United States and that use such engines; and the owners or operators of such U.S. vessels; companies and persons that rebuild or maintain these engines; Category 3 marine vessels fuel makers, importers, distributors, sellers, dispensers. Manufacturers of new marine diesel engines and marine vessels. Engine repair and maintenance. Petroleum refineries, bulk stations and terminals, wholesalers. Coastal and Great Lakes Freight and Passenger Transportation.

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
8	Primary National Ambient Air Quality Standard for Sulfur Dioxide (Final)	Final rule published June 22, 2010	**$1.5 billion ($2006) in 2020** for full attainment. Because this analysis only considers counties that currently have an SO2 monitor, EPA advises that, as the new monitoring network is installed, there may be more potential nonattainment areas than have been analyzed in the RIA. (RIA ES-1 and 9: Regulatory Impact Analysis)	Lowers the primary National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO2) by setting new short term (one-hour) SO2 standard at 75 parts per billion (ppb), and revoking the prior 24-hour and annual SO2 health standards. Also establishes new monitoring requirements for SO2.	Rule will require states to prepare implementation plans addressing how they will meet the new standards through control programs directed to emission sources.
9	NESHAP MACT Reconsideration for Portland Cement (Final)	Final Rule published September 9, 2010	**EPA estimates $926 – $950 million annually** in 2013 (combined with rule below). (*See* 8/9/2010 press	Sets the limits on mercury air emissions from existing cement kilns, strengthens the limits for new kilns, and sets emission limits that will reduce acid gases. Also limits particle pollution from new and existing kilns, and sets new-kiln	Rule affects Portland cement manufacturing plants.

			release) (also citing another EPA analysis estimating lower costs of $350 million annually). EPA estimates that the average price for Portland cement could be 5.4% higher with the NESHAP and NSPS (see below), and that domestic production may fall by 11%, and operating profits may fall by $241 million (page 276).	limits for particle and smog-forming nitrogen oxides and sulfur dioxide.	
10	Review of New Source Performance Standards -- Portland Cement (Final)	Final rule released August 8, 2010	See cost estimate immediately above.	Sets New Source Performance Standards (NSPS) regulate criteria pollutants, such as particulate matter, sulfur dioxide, and nitrogen oxides from new stationary sources.	Rule affects Portland cement manufacturing plants.
11	Reciprocating Internal Combustion Engines: Final National Emissions Standards for Hazardous Air Pollutants - Spark Ignition Engines	Final rule published August 20, 2010	Total capital cost for existing stationary internal combustions engines	Sets national emission standards for hazardous air pollutants for existing stationary spark ignition reciprocating internal combustion engines that either are located at area sources of hazardous air	Rule affects industries using stationary internal combustion engines. Potentially regulated categories and entities include: Electric power generation, transmission, or distribution; Medical

	(Final)		estimated to be **$383 million,** with a total national annual cost of **$253 million** ($2009) in year 2013 (the first year this rule is implemented). (75 Fed. Reg. 51582: Regulatory Impact Analysis)	pollutant emissions or that have a site rating of less than or equal to 500 brake horsepower and are located at major sources of hazardous air pollutant emissions.	and surgical hospitals; Natural gas transmission; Crude petroleum and natural gas production; Natural gas liquids producers.
12	Mandatory Reporting of Greenhouse Gases (Final)	Final rule published October 30, 2009	National annualized cost for first year estimated to be **$132 million,** and total national annualized cost for subsequent years to be **$89 million** ($2006) (75 Fed. Reg. 56362)	Requires reporting of greenhouse gas emissions from all sectors of the economy. Sets data collection and reporting requirements. EPA estimates during the first year the rule will affect approximately 30,000 facilities that will need to determine whether they are subject to the rule, and that ultimately approximately 10,152 facilities will be required to report.	Rule applies to fossil fuel suppliers and industrial gas suppliers, direct greenhouse gas emitters and manufacturers of heavy-duty and offroad vehicles and engines. Potentially regulated categories and entities include: Facilities operating boilers, process heaters, incinerators, turbines, and internal combustion engines. Extractors of crude petroleum and natural gas. Pulp and paper mills. Manufacturers of lumber and wood products and chemical, rubber and miscellaneous plastic products, motor vehicle parts and accessories, adipic acid, anhydrous and aqueous ammonia, Portland Cement, ferroalloys, glass, chlorodifluoromethane, hydrogen, calcium oxide, calcium hydroxide,

					dolomitic hydrates, nitric acid, ethylene dichloride, acrylonitrile, ethylene oxide, methanol, ethylene, carbon black, silicon carbide abrasives, alkalies and chlorine, phosphoric acid, titanium dioxide, industrial gas, heavy-duty, non-road, aircraft, locomotive, and marine diesel engine, heavy-duty vehicle, small non-road, and marine spark-ignition engine, personal watercraft and motorcycle. Steel works, blast furnaces. Electroplating, plating, polishing, anodizing, and coloring. Electric, gas, sanitary, health and educational services. Fossil-fuel fired electric generating units. Primary Aluminum production facilities. Integrated iron and steel mills, steel companies, sinter plants, blast furnaces, basic oxygen process furnace shops. Lead smelting and refining facilities. Petroleum refineries. Pulp, paper and paperboard mills. Soda ash, natural, mining and/or beneficiation. Primary zinc refining facilities. Zinc dust reclaiming facilities. Solid waste landfills. Sewage treatment facilities. Beef cattle feedlots. Dairy cattle and milk production facilities. Hog and pig farms. Chicken egg production

					facilities. Turkey, Broilers and Other Meat type Chicken Production. Coal liquefaction at mine sites. Natural gas liquid extraction facilities.
13	Petroleum and Natural Gas Systems Greenhouse Gas Reporting Rule (Proposed)	Final rule projected October 2010	**$56-59 million in the first year and subsequent annualized costs of $21-25.3 million** ($2006). 75 Fed. Reg. 18628: Economic Impact Analysis)	Proposes to supplement mandatory greenhouse gas reporting rule by requiring reporting of greenhouse gas emissions from the petroleum and natural gas industry.	Rule will affect petroleum and natural gas systems. Potentially regulated categories and entities include: Pipeline transportation of natural gas; Natural gas distribution facilities; Extractors of crude petroleum and natural gas; Natural gas liquid extraction facilities.
14	National Emission Standards for Halogenated Solvent Cleaning – Remand	NPRM extension closed February 2009. No date for next step noted.	**Total capital costs between $15.65 - 49.89 million; total annual costs between $1.38 – 2.839 million** (73 Fed. Reg. 62402).	Proposes to sets emission limits for certain halogenated solvent cleaning machines sources.	Rule would affect industries using halogenated solvent cleaning primarily including: Manufacturing of primary metals, fabricated metals, machinery, computer and electronic products, electrical equipment, transportation equipment, and furniture.
15	National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries (Final)	Final rule published October 28, 2009	**Total capital investment cost estimated to be $16 million, and total annualized cost of controls estimated to be**	This action amends the national emission standards for petroleum refineries to add maximum achievable control technology standards for heat exchange systems.	Rule will affect petroleum refineries located at a major source that are subject to 40 CFR part 63,subpart CC, including those categorized as small businesses.

			$3 million, which includes $2.2 million credit for recovery of lost product and the annualized cost of capital. (Page 55680, Economic Impact Analysis)		
16	Standards of Performance for New Stationary Sources and Emissions Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators (Final)	Final rule published October 6, 2009	**Total costs would be $15.5 million in each of the first 3 years** for 57 existing HMIWI to comply with MACT compliance option. For alternative disposal option, total costs would be approximately $10.6 million per year. (74 Fed. Reg. 51397-8, Economic Impacts of Revised Standards)	Sets revised emission limits for hospital/medical/infectious waste incinerators (HMIWI).	Rule will affect those who operate HMIWI, including Federal, state, tribal, and private hospitals, health care facilities, research facilities, waste disposal companies and private universities. .

17	National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Paints and Allied Products Manufacturing (Final)	Final rule published December 3, 2009	Total capital costs for installing particulate control devices is **$8.1 million** and annual cost is estimated to be **$3.1 million** per year. (74 Fed. Reg. 63523, Economic Impact Analysis)	Sets emission standards for control of hazardous air pollutants (HAP) for the Paints and Allied Products Manufacturing area source category. EPA estimates 21% of facilities, or 460 area sources, will be required to install particulate control equipment. 110 facilities will be required to install lids or covers on their process, mixing, and storage vessels. The other affected facilities will incur costs only for submitting the notifications and for completing the annual compliance certification.	Rule applies to owners and operators of facilities performing paints and allied products manufacturing that is an area source of hazardous air pollutant (HAP) emissions and processes, uses, or generates materials containing the following HAP: benzene, methylene chloride, and compounds of cadmium, chromium, lead, and nickel. Examples of potentially regulated entities include area source facilities engaged in mixing pigments, solvents, and binders into paint and other coatings, such as stains, varnishes, lacquers, enamels, shellacs, and water repellant coatings for concrete and masonry, as well as area source facilities primarily engaged in manufacturing adhesives, glues, caulking compounds, printing inkjet inks and cartridges; indelible ink, India ink writing; ink, and stamp pad ink.
f	Standards of Performance for Coal Preparation and Processing Plants (Final)	Final rule published October 8, 2009	Total **$7.9 million in each of first 5 years of compliance**. Potential additional costs for new thermal	Sets revised new source performance standards for coal preparation and processing plants.	Categories and entities potentially regulated by the revised standards include: Mining of bituminous coal, lignite, anthracite. Fossil Fuel Electric Power Generation; Paper (except Newsprint) Mills; Manufacturing of petrochemicals

			dryers estimated to range from $133,000 to $1.54 million per year. (74 Fed. Reg. 51975: Economic Impact Analysis)		and cement. Iron and steel mills; Fossil fuel-fired electric utility steam generating units.
19	Greenhouse Gas Reporting Rule for Additional Sources of Fluorinated GHGs (Proposed)	Final rule projected October 2010	**$6.1 - $7.8 million in total annualized costs in the first year; $3.9 - $5.6 million in subsequent years** ($2006). (75 Fed. Reg. 18690, Economic Impact Analysis)	Proposes to supplement greenhouse gas mandatory reporting rule published in the Federal Register Oct. 30, 2009 by adding greenhouse gas reporting requirements for five source categories: 1) Electronics Manufacturing, 2) Fluorinated Gas Production, 3) Use of Electrical Transmission and Distribution Equipment, 4) Manufacture or Refurbishment of Electrical Equipment, and 5) Importers of Pre-charged Equipment and Closed-Cell Foams.	Rule will affect owners and operators of the referenced facilities. Regulated categories and entities include: Manufacturing of microcomputers, semiconductor devices, LCD unit screens, industrial gases, electrical equipment, air-conditioning equipment (except motor vehicle), polyurethane foam products; Power transmission and distribution switchgear and specialty transformers; Air-conditioning equipment (except room units) merchant wholesalers; Household appliance stores; and Circuit breakers merchant wholesalers.

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
20	Mandatory Reporting of Greenhouse Gases From Magnesium Production, Underground Coal Mines, Industrial Wastewater Treatment, and Industrial Waste Landfills (Proposed)	Final rule published July 12, 2010	**Total annualized costs of $7 million in the first year and $5.5 million in subsequent years** ($2006) (75 Fed. Reg. page 39753)	Proposes to supplement greenhouse gas mandatory reporting rule published in the Federal Register Oct. 30, 2009 by adding greenhouse gas reporting requirements for four source categories: magnesium production, underground coal mines, industrial wastewater treatment, and industrial waste landfills.	Rule will affect magnesium production, underground coal mines, industrial wastewater treatment, and industrial waste landfills. Potentially regulated entities include: Primary refiners of nonferrous metals by electrolytic methods; Secondary magnesium processing plants; Underground anthracite and bituminous coal mining operations; Solid waste landfills; Pulp, paper, newsprint and paperboard mills; Meat processing facilities; Frozen fruit, juice, and vegetable manufacturing facilities; Fruit and vegetable canning facilities; Sewage treatment facilities; Ethanol manufacturing facilities.
21	Review of New Sources and Modifications in Indian Country (a.k.a. NSR in Indian Country) (Proposed)	NPRM comment period closed November 20, 2006; final rule sent to OMB for review September 2010 and	**Total annualized costs of compliance estimated to be $6 million per year** (Economic Impact Analysis ES-1)	EPA is developing federal regulations to govern preconstruction permitting of minor stationary sources throughout Indian country and major stationary sources of air pollution in nonattainment areas in Indian country.	Potentially regulated categories and entities include: gasoline station storage tanks and refueling; lumber manufacturer support; coal mining; furniture manufacture; medical waste incinerator; repellent and fertilizer applications; natural gas plant; oil and gas production; copper mining and processing; stone

		projected to be published as soon as December 2010			quarrying and processing; sand and gravel production; power plant-coal-fired, biomass fueled, landfill gas fired; natural gas collection and pipeline; sawmill; window and door molding manufacturer; printing operations; surface coating operations; plants of asphalt hot mix, elemental phosphorus, sulfuric acid; cobalt and tungsten recycling; surface coating operations; concrete batching plant; grain elevator; crude oil storage and distribution; natural gas compressor station; automobile refinishing shop; dry cleaners.
22	National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category and Addition to Source Category List for Standards (Proposed)	Proposed rule published April 28, 2010; comment period extended	**Capital costs of of $5 million** for emission controls; **annualized cost of $2.3 million**. The capital costs for monitoring, reporting, and recordkeeping are estimated as **$1.0 to $1.3 million with a total annualized cost of $0.8 to $1.5 million per year,** depending	Proposes to add the gold mine ore processing and production area source category to the list of source categories subject to regulation under the hazardous air pollutant section of the Clean Air Act (CAA) due to their mercury emissions. EPA is also proposing national mercury emission standards for this category based on the emissions level of the best performing facilities which are well controlled for mercury.	Rule affects gold ore mining and potentially regulated entities include: establishments primarily engaged in developing the mine site, mining, and/or beneficiating (i.e., preparing) ores valued chiefly for their gold content; establishments primarily engaged in transformation of the gold into bullion or dore bar in combination with mining activities are included in this industry.

			on monitoring option that is chosen. (75 Fed. Reg. 22486, Estimates for Costs of the Proposed Rule)		
23	National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources (Final)	Final rule published October 29, 2009	**Total capital cost of $2.8 million; total annualized cost, including the annualized cost of capital equipment is estimated to be $3.2 million per year** (74 Fed. Reg. 56039).	Sets emission standards for the control of hazardous air pollutants for nine area source categories in the chemical manufacturing sector: Agricultural Chemicals and Pesticides Manufacturing, Cyclic Crude and Intermediate Production, Industrial Inorganic Chemical Manufacturing, Industrial Organic Chemical Manufacturing, Inorganic Pigments Manufacturing, Miscellaneous Organic Chemical Manufacturing, Plastic Materials and Resins Manufacturing, Pharmaceutical Production, and Synthetic Rubber Manufacturing.	The rule affects the chemical manufacturing industry. Potentially regulated categories and entities include: Chemical manufacturing area sources that use as feedstock, generate as byproduct, or produce as product, any of the HAP subject to this subpart except for: (1) Processes classified in NAICS Code 325222, 325314, or 325413; (2) processes subject to standards for other listed area source categories 2 in NAICS 325; (3) certain fabricating operations; (4) manufacture of photographic film, paper, and plate where material is coated or contains chemicals (but the manufacture of the photographic chemicals is regulated); and (5) manufacture of radioactive elements or isotopes, radium chloride, radium luminous compounds, strontium, and uranium.
24	Revisions to Motor Vehicle Fuel Economy Label (Proposed)	Proposed rule published September 23,	**$649,000—$2.8 million per year** (75 Fed. Reg.	Proposes to amend the way in which fuel economy estimates are calculated and/or displayed (but will	Rule will affect companies that manufacture or sell new light-duty vehicles, light-duty trucks, and

		2010; comment period closes November 2010	58084)	not impact the Corporate Average Fuel Economy requirements).	medium-duty passenger vehicles, as defined under EPA's CAA regulations, and passenger automobiles (passenger cars) and nonpassenger automobiles (light trucks) as defined under NHTSA's CAFE regulations.
25	National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Prepared Feeds Manufacturing (Final)	Final rule published January 5, 2010	Nationwide capital costs estimated to be around **$2.5 million.** Annual costs estimated to be just over **$3 million/year**. (75 Fed. Reg. 544, Economic Impact Analysis)	Sets emission standards for control of hazardous air pollutants (HAP) for the Prepared Feeds Manufacturing area source category.	Rule affects animal foods manufacturing and prepared animal feeds (except dog and cat).
26	Greenhouse Gas Reporting Rule re Corporate Parent and NAICS Code (Final)	Final rule published September 22, 2010	The total national cost is approximately **$944,000 in the first year and about $470,000 in subsequent years** ($2006) (page 57682)	Proposes to further revise greenhouse gas mandatory reporting rule published in the Federal Register Oct. 30, 2009 by requiring reporters to provide additional data on U.S. U.S. parent company, NAIC codes and an indication of whether reported emissions are from a co-generation unit.	Rule will affect facilities with direct greenhouse gas emissions over 25,000 metric tons of carbon dioxide equivalent (CO_2e), suppliers of petroleum, natural gas, and industrial gases as well as vehicle and engine manufacturers outside the light duty sector to report to EPA annually. Examples of regulated entities include: Facilities operating boilers, process heaters, incinerators, turbines, and internal

					combustion engines. Extractors of crude petroleum and natural gas. Pulp and paper mills. Manufacturers of lumber and wood products, chemicals, rubber and miscellaneous plastic products, motor vehicle parts and accessories, ammonia, Portland Cement, ferroalloys, coal products, glass, chlorodifluoromethane, hydrogen, nitric acid, ethylene dichloride, acrylonitrile, ethylene oxide, methanol, carbon black, calcium oxide, calcium hydroxide, dolomitic hydrates, phosphoric acid. Steel works, blast furnaces. Electroplating, plating, polishing, anodizing, and coloring. Electric, gas, sanitary, health and educational services. Fossil-fuel fired electric generating units. Primary Aluminum production facilities. Integrated iron and steel mills, steel companies, sinter plants, blast furnaces, basic oxygen process furnace shops. Lead smelting and refining facilities. Solid waste landfills. Sewage treatment facilities. Beef cattle feedlots. Dairy

					cattle and milk production facilities. Hog and pig farms. Chicken egg production facilities. Turkey Production. Natural gas distribution and extraction facilities. Industrial gas manufacturing facilities.
27	GHG Reporting Rule for Carbon Dioxide Injection and Geologic Sequestration (Proposed)	Final Rule projected October 2010	Annual costs of **$714,000** ($2008) on impacted CO2 injection facilities; **$344,000 for public sector burden**. However, "this may underestimate the total public sector burden." ($2008) (75 Fed. Reg. 18596, Economic Impact Analysis)	Proposes to supplement greenhouse gas mandatory reporting rule published in the Federal Register Oct. 30, 2009 by adding greenhouse gas reporting requirements for facilities that conduct geologic sequestration or that inject CO2 underground to report greenhouse data to EPA annually.	Rule will affect enhanced oil and gas recovery projects and carbon geological sequestration projects, including all (80) CO2 injection facilities.
28	Standards of Performance for Stationary Compression Ignition and Spark Ignition Internal Combustion Engines (Proposed)	Proposed rule published June 8, 2010; comment period extended September 8, 2010	Total national capital cost estimated to be **$236,000 in the year 2018**, with total annual cost of **$142,000 in the year 2018.**	Proposes revised standards of performance for new stationary compression ignition internal combustion engines under section 111(b) of the Clean Air Act. The proposed rule would implement more stringent standards for stationary compression ignition	Rule affects manufacturers that produce or any industry using a stationary internal combustion engine as defined in the proposed rule. Potentially regulated categories and entities include: Electric power generation, transmission, or distribution; Medical

			The year 2018 is the first year the emission standards would be fully implemented for stationary CI engines between 10 and 30 l/cyl. Total national capital cost for proposed rule in year 2030 is $235,000, with total national annual cost of $711,000 (75 Fed. Reg. 32620).	engines with displacement greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder.	and surgical hospitals; Manufacturing: motor and generator, pump and compressor, welding and soldering equipment.
29	National Emission Standards for Hazardous Air Pollutants for Area Sources: Chemical Preparations Industry (Final)	Final rule published December 30, 2009	Annual cost of monitoring is estimated to be **$6,800 per facility per year** after the first year. The additional cost of one-time activities during the first year of compliance is estimated to be approximately	Sets national emissions standards for control of hazardous air pollutants (HAP) from the chemical preparations area source category.	Rule affects chemical product and preparation manufacturing. The final rule is estimated to impact a total of 26 area source facilities with 40% qualifying as small businesses. Potentially regulated categories and entities include: Area source facilities that manufacture chemical preparations containing metal compounds of chromium, lead, manganese, or nickel, except for manufacturers of indelible ink, India ink, writing ink, and stamp pad ink. Chemical preparations include, but

			$2,400 per facility. (74 Fed. Reg. 69206, Economic Impact Analysis)		are not limited to, fluxes, water treatment chemicals, rust preventatives and plating chemicals, concrete additives, gelatin, and drilling fluids.

Rules for which EPA provided no specific compliance cost estimate in rulemaking documents – listed by date of most recent action

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
30	Predictive Emission Monitory System in Stationary Sources: Performance Specification 16 (Final)	Final rule published March 2009	No cost estimate provided.	Promulgates Performance Specification (PS) 16 for predictive emissions monitoring systems (PEMS), to predict nitrogen oxides emissions from small industrial, commercial, and institutional steam generating units. Performance Specification 16 provides testing requirements for assessing the acceptability of PEMS when they are initially installed.	Rule may affect the following potentially regulated categories and entities: Stationary Gas Turbines. Steam Generating Units. Portland Cement and Rubber Tire Manufacturing. Hazardous Waste Incinerators. Coating: Large Appliances, Metal Furniture, Graphic Arts, Magnetic Tape, Metal Coil Surface, Beverage Can Surface. Industrial Surface, Pressure Sensitive Tape and Label Surface, Boat and Ship Manufacturing and Repair Surface, Plastic Parts Surface, Plastic Parts for Business Machines. Fabric Printing, Coating, and Dyeing. Leather Finishing. Wood Building products and furniture. Coke Ovens.

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
31	NESHAP: Brick and Structural Clay Products and Clay Products (Proposed)	Pre-proposal initiated June 11, 2009	TBD	The rulemaking will establish emission limits for hazardous air pollutants (HF, HCl and metals) emitted from brick and clay ceramics kilns and glazing operations at clay ceramics production facilities.	The brick and structural clay products industry primarily includes facilities that manufacture brick, clay, pipe, roof tile, extruded floor and wall tile, and other extruded dimensional clay products from clay, shale, or a combination of the two. The clay ceramics manufacturing source category includes facilities that manufacture traditional ceramics, which include ceramic tile, dinnerware, sanitaryware, pottery, and porcelain.
32	Revisions to Test Method for Determining Stack Gas Velocity Taking Into Account Velocity Decay Near the Stack Walls (Proposed)	Proposed rule published August 25, 2009	EPA expects the proposed revised method will only be used by small entities if the use of the revised method results in overall cost savings due to the voluntary nature of the method (74 Fed. Reg. 42822).	Proposes revising the voluntary test method for determining stack gas velocity taking into account the velocity decay near the stack or duct walls.	Rule will affect Fossil fuel-fired electric utility steam generating units owned by industry, Federal, State/local and Tribal governments.
33	Action To Ensure Authority To Issue Permits Under the Prevention of Significant Deterioration Program to Sources of	Proposed rule published September 2, 2010	No cost estimate provided.	One of two separate rulemakings (see below for companion rulemaking) EPA is proposing to address permitting in states that do not have approved PSD programs	Potentially affected Entities include States, local permitting authorities, and tribal authorities. Any SIP-approved PSD air permitting regulation that is not

	Greenhouse Gas Emissions: Federal Implementation Plan (Proposed)	Projected final rule December 1, 2010		that apply to greenhouse gas emitting sources. In this rule, EPA is proposing a Federal implementation plan (FIP) to apply in any State that is unable to submit, by its deadline, a corrective State implementation plan (SIP) revision to ensure that the State has authority to issue permits under the Clean Air Act's New Source Review Prevention of Significant Deterioration (PSD) program for sources of greenhouse gases (GHGs).	structured such that it includes GHGs among pollutants subject to regulation under the Act will potentially be found substantially inadequate to meet CAA requirements, under CAA section 110(k)(5), and the State will potentially be affected by this rule. For example, if a State's PSD regulation identifies its regulated NSR pollutants by specifically listing each individual pollutant and the list omits GHGs, then the regulation is inadequate (page 53884).
34	Action To Ensure Authority To Issue Permits Under the Prevention of Significant Deterioration Program to Sources of Greenhouse Gas Emissions: Finding of Substantial Inadequacy and SIP Call (Proposed)	Proposed rule published September 2, 2010 Projected final rule December 1, 2010	No cost estimate provided.	One of two separate rulemakings (see above for companion rulemaking) EPA is proposing to address permitting in states that do not have approved Prevention of Significant Deterioration (PSD) programs that apply to greenhouse gas emitting sources. In this rule, EPA is proposing to find that 13 States with EPA-approved State implementation plan (SIP) New Source Review PSD programs are substantially inadequate to meet Clean Air Act requirements because they do not appear to apply PSD requirements to GHG-emitting sources. For each of these States, EPA proposes to require the State	Alaska; Arizona: Pinal County; Rest of State (Excludes Maricopa County, Pima County, and Indian Country); Arkansas; California: Sacramento Metropolitan AQMD, Connecticut; Florida; Idaho; Kansas; Kentucky: Jefferson County and Rest of State; Nebraska; Nevada: Clark County; Oregon; Texas; possibly other states.

				(through a "SIP Call") to revise its SIP as necessary to correct such inadequacies. EPA proposes an expedited schedule for States to submit their corrective SIP revision, in light of the fact that as of January 2, 2011, certain GHG-emitting sources will become subject to the PSD requirements and may not be able to obtain a PSD permit in order to construct or modify. As for the rest of the States with approved SIP PSD programs, EPA solicits comment on whether their PSD programs do or do not apply to GHG-emitting sources. If, on the basis of information EPA receives, EPA concludes that the SIP for such a State does not apply the PSD program to GHG-emitting sources, then EPA will proceed to also issue a finding of substantial inadequacy and a SIP Call for that State.	
35	Emissions Factors Program Improvements	ANPRM published October 14, 2009	No cost estimate provided.	The purpose of this Advanced Notice of Proposed Rulemaking is to convey issues raised by stakeholders about EPA's emissions factors program, inform the public of our initial ideas on how to address these issues, and solicit comments on our current thinking to resolve these issues. EPA's goal is to	Rule may affect owners and operators of stationary sources who use emissions factors and, including those subject to source testing requirements under EPA air rules (*i.e.,* New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP), and

				develop a self-sustaining emissions factors program that produces high quality, timely emissions factors, better indicates the precision and accuracy of emissions factors, encourages the appropriate use of emissions factors, and ultimately improves emissions quantification. Although initially developed for emissions inventory purposes only, use of emissions factors has been expanded to a variety of air pollution control activities including permitting, enforcement, modeling, control strategy development, and risk analysis. This ANPRM discusses the appropriateness of using emissions factors for these activities.	Maximum Achievable Control Technology (MACT) standards) and other industry sectors.
36	NESHAP Residual Risk and Technology Review for Ferroalloys	Initiated December 2009; no timeline listed (No Pre-Proposal text currently available)	TBD	Under the "technology review" provision of CAA section 112, EPA must review maximum achievable control technology (MACT) standards and revise them "as necessary (taking into account developments in practices, processes and control technologies)" no less frequently than every 8 years. Under the "residual risk" provision of the CAA section 112, EPA must evaluate the	TBA

				MACT standards within 8 years after promulgation and promulgate standards if required to provide an ample margin of safety to protect public health or prevent an adverse environmental effect. EPA has combined the two review activities into the "risk and technology" (RTR) reviews for the Ferroalloys Production source category.	
37	Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act (a/k/a Endangerment Finding) (Final)	Final rule published December 15, 2009	No cost estimate provided for greenhouse gas regulations that will result from the findings. (74 Fed. Reg. 66515-66516, 66545).	EPA Administrator Jackson found that (1) the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) — in the atmosphere threaten the public health and welfare of current and future generations; and (2) finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare. This action was a prerequisite to finalizing the EPA's proposed greenhouse gas emission	EPA states this action does not itself impose any requirements on industry or other entities.

				standards for light-duty vehicles, which EPA proposed in a joint proposal including the Department of Transportation's proposed CAFE standards on September 15, 2009 (see above). This action is also a prerequisite to issuing other EPA greenhouse gas regulations for stationary sources.	
38	Requirements for Control Technology Determinations for Major Sources in Accordance With Clean Air Act Sections, Sections 112(g) and 112(j) (Proposed)	Proposed rule published March 30, 2010; comment period extended through the end of May 2010	EPA concludes the rule does not impose any new costs. (75 Fed. Reg. 15660).	Proposes amending the rule governing case-by-case emission limits for major sources of hazardous air pollutants under section 112(j) of the Clean Air Act. Specifically, EPA is proposing revisions to the section 112(j) rule to clarify and streamline the process for establishing case-by-case emission limits in the case of the complete vacatur of a section 112(d) rule applicable to a major source category initially listed pursuant to section 112(c)(1). In addition, EPA is also proposing revisions that would eliminate provisions of the section 112(j) rule that have become obsolete or are redundant.	Rule may affect the following regulated categories and entities: Facilities that polymerize vinyl chloride monomer to produce polyvinyl chloride and/or copolymer products. Manufacturing of ceramic wall and floor tile, vitreous plumbing fixtures (sanitaryware), lumber and wood products, rubber and miscellaneous plastic products, coal products, chemicals, motor vehicle parts and accessories. Pulp and paper mills. Petroleum refiners. Steel works, blast furnaces. Electroplating, plating, polishing, anodizing, and coloring. Electric, gas, sanitary, health and educational services. Sources in a source category "initially listed" and regulated under any other section 112(d) emission standard for hazardous air pollutants that is completely vacated by the Court of Appeals for the District of Columbia.

39	Prevention of Significant Deterioration (PSD): Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by the Federal PSD Permit Program (a.k.a. Johnson Memo Reconsideration) (Final)	Final Action on Reconsideration of Interpret-ation published April 2, 2010	N/A	EPA determination that it will continue to apply the Agency's determination, set forth in a December 18, 2008 Administrator memorandum, that Prevention of Significant Determination (PSD) permitting requirements would not apply to a newly regulated pollutant until a regulatory requirement to control emissions of that pollutant "takes effect."	Rule affects Stationary emissions sources, including PSD permitting requirements relating to greenhouse gas emissions.
40	Revisions to the General Conformity Regulations (Final)	Final rule published April 5, 2010	No cost estimate provided.	Revises regulations requiring that Federal actions conform to the appropriate State, tribal or Federal implementation plan for attaining clean air ("General Conformity"). Prevents air quality impacts of federal agency actions from causing or contributing to a violation of a NAAQS standard.	Rule affects Federal agencies and public and private entities that receive approvals or funding from Federal agencies such as airports and seaports.
41	Renewable Fuels Standard Program: Regulation of Fuels and Fuel Additives: Modifications to Renewable Fuel Standard Program; Final Rule; and Regulation of Fuels and Fuel Additives: Modifications to Renewable Fuel Standard Program	Final rules published May 10, 2010 and June 30, 2010	No cost estimate provided. EPA concludes the action will not have a significant impact on a substantial number of small entities.	Amends Renewable Fuel Standard program regulations published March 26, 2010 to make technical and other changes.	Rule affects those involved with the production, distribution and sale of transportation fuels. Examples of potentially regulated entities include: Petroleum refiners, importers. Ethyl alcohol manufacturers. Other basic organic chemical manufacturers. Chemical and allied products merchant wholesalers. Petroleum bulk stations and terminals. Petroleum and petroleum products merchant wholesalers.

	(Final)				Fuel dealers.
42	Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (Final)	Final rule published June 3, 2010	EPA concludes that the rule provides regulatory relief rather than regulatory requirements. (75 Fed. Reg. 31598: Regulatory Impact Analysis)	Sets thresholds pursuant to which EPA seeks to phase in regulation of GHG emissions from industrial and large stationary sources under: 1) the Prevention of Significant Deterioration (PSD) program which is a preconstruction review and permitting program that requires installation of "Best Available Control Technology" (BACT) pollution control equipment; and 2) the title V program, which is an operating permit program administered by state authorities. Absent the rule, EPA's view is that under the endangerment finding and subsequent light-duty vehicle rule, PSD permitting requirements would be triggered for almost 41,000 entities and title V permitting requirements for approximately 6 million entities. The rule also commits to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from PSD and title V permitting for GHG emissions until at least April 30, 2016.	Rule may affect the following potentially regulated entities and categories: Agriculture, fishing, and hunting. Mining Utilities (electric, natural gas, other systems). Manufacturing: food, beverages, tobacco, textiles, leather, wood product, paper, petroleum, coal, chemical, rubber product, chemical products, nonmetallic mineral products, primary and fabricated metal, machinery, computer and electronic products, electrical equipment, appliance, and components, transportation equipment, furniture and related products. Waste management and remediation. Hospitals/ nursing and residential care facilities. Personal and laundry services. Residential/private households. Non-Residential (Commercial).
43	Lead Emissions From Piston-Engine Aircraft Using Leaded Aviation	ANPRM closed on August 27,	TBD	ANPR and extension of comment period for EPA's announcement of a proposed rulemaking on lead	TBA

	Gasoline	2010; no timeline for proposal posted		emissions from piston engine powered aircraft using leaded aviation gasoline. Describes information available and information being collected that will be used by the Administrator to issue a subsequent proposal regarding whether, in the Administrator's judgment, aircraft lead emissions from aircraft using leaded aviation gasoline cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.	
44	Mercury Cell Chlor-Alkali NESHAP MACT	NPRM closed August 11, 2008; Supplemental NPRM sent to OMB July 2010 and projected to be published in October 2010	TBD for supplemental NPRM. (2008 NPRM did not provide estimates)	This action is a supplemental proposal for amendment of the national emission standards for hazardous air pollutants (NESHAP) for mercury emissions from mercury cell chlor-alkali plants that was promulgated in 2003. The 2003 NESHAP limited mercury air emissions from existing plants and prohibited the use of mercury in new plants.	TBA
45	Prevention of Significant Deterioration for PM2.5 - Increments, Significant Impact Levels and Significant Monitoring Concentrations	Final Rule projected October 2010	No cost estimate provided.	Proposes to facilitate implementation of PM2.5 Prevention of Significant Deterioration (PSD) program by establishing new increments, significant impact levels (SILs) and a significant monitoring	Rule will affect owners and operators of emissions sources in the following industry, Federal and state, local and tribal groups. Electric services. Petroleum refining. Industrial inorganic and organic

	a.k.a. PSD for PM2.5 - Increments, Significant Impact Levels and Significant Monitoring; Concentrations			concentration (SMC) for fine particulate matter (particles with an aerometric diameter less than or equal to a nominal 2.5 micrometers, "PM2.5").	chemicals. Natural gas liquids and transport. Pulp and paper mills. Automobile manufacturing. Pharmaceuticals. .
46	National Emission Standards for Hazardous Air Pollutant Emissions: Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks; Group I Polymers and Resins; Marine Tank Vessel Loading Operations; Pharmaceuticals Production; the Printing and Publishing Industry; and Steel Pickling--HCl Process Facilities and Hydrochloric Acid Regeneration Plants (subparts N, U, Y, KK, CCC, GGG)	NPRM projected November 2010	Cost Analysis dependent on industry (73 Fed. Reg. 60451-60455).	This action proposes 1) how EPA will address the residual risk and technology reviews conducted for 2 national emission standards for hazardous air pollutants (NESHAP), and 2) provides supplemental notice of proposed rulemaking for residual risk and technology reviews for 4 additional NESHAP previously proposed in October 2008. The 6 NESHAP include 16 source categories. This action proposes to modify the existing emissions standards for 8 source categories in 3 of the 6 NESHAP to address certain emission sources not currently regulated under these standards. It also proposes for all 6 NESHAP to address provisions related to emissions during periods of startup, shutdown, and malfunction. Finally, this action proposes changes to 2 of the 6 NESHAP to correct editorial errors,	Potentially regulated categories and industries included: Epichlorohydrin; Elastomers Production; Hypalon TM Production; chromium electroplating facilities, polymers and resins production facilities, and other various industries, such as the chemical industry, that load and unload liquid commodities in bulk onto and from marine vessels. Examples of potentially regulated categories and entities include: Nitrile Butadiene; Rubber Production; Polybutadiene Rubber Production; Styrene Butadiene; Rubber and Latex Production; Marine Vessel Loading; Mineral Wool Production; Pharmaceuticals Production; Printing and Publishing

				make clarifications, or address issues with implementation or determining compliance.	
47	Regulation to Prevent the Misfueling of Vehicles and Engines with Gasoline Containing Greater than Ten Volume Percent Ethanol and Modifications to the Reformulated and Conventional Gasoline Programs	NPRM projected November 2010	TBD	Proposes to control and regulate distribution of fuels and fuel additives that may pose harm to the environment or public health.	TBA
48	Control of Greenhouse Gas Emissions from Heavy-Duty Vehicles	ANPRM published; proposed rule projected October 2010	TBD	Proposes to sets national emission standards to control greenhouse gas emissions from heavy duty trucks and buses.	TBA
49	Review of New Source Performance Standards for Nitric Acid Plants - Subpart G	NPRM projected November 2010	TBD	The law mandates EPA review and if appropriate revise existing New Source Performance Standards (NSPS) at least every 8 years. This NSPS was initially promulgated in 1971. This NSPS was reviewed in 1979 and 1984. On January 2010, consent decree was entered into US District Court between EPA and several environmental groups. The decree requires proposed revisions to be made by November 2010 and final revisions to be made by November 2011.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
50	Review of the National Ambient Air Quality Standards for Carbon Monoxide	NPRM projected November 2010	TBD	The law mandates EPA review and, if appropriate, revise air quality criteria for primary (health-based) and secondary (welfare-based) national ambient air quality standards (NAAQS) every 5 years. The last CO NAAQS review occurred in 1994 with a decision by the Administrator not to revise the existing standards. The current review, which was initiated in September 2007, includes the preparation of an Integrated Science Assessment, Risk/Exposure Assessment, and a Policy Assessment Document by EPA, with opportunities for review by EPA's Clean Air Scientific Advisory Committee and the public. These documents inform the Administrator's decision as to whether to retain or revise the standards.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
51	Risk and Technology Review NESHAP for Shipbuilding and Ship Repair (Surface Coating) and Wood Furniture Manufacturing	NPRM projected November 2010	TBD	This action would conduct residual risk and technology reviews for two industrial source categories regulated by two National Emission Standards for Hazardous Air Pollutants (NESHAP): Shipbuilding and Ship Repair (Surface Coating), and Wood Furniture Manufacturing. The underlying national emission standards that are under review in this action limit and control hazardous air pollutants. Section 112(f)(2) of the Clean Air Act (CAA) directs EPA to assess the risk remaining (residual risk) after the application of the NESHAP and promulgate additional standards if warranted to provide an ample margin of safety to protect public health or prevent an adverse environmental effect. Also, section 112(d)(6) of the CAA requires EPA to review and revise the NESHAP as necessary at least every 8 years, taking into account developments in practices, processes, and control technologies. This action would conduct those reviews for the two source categories cited above.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
52	Revision to Definition of Volatile Organic Compounds - Exclusion of Methyl Iodide (a.k.a. Methyl Iodide Exemption from Definition of VOCs)	NPRM projected November 2010	TBD	EPA lists for regulation certain volatile organic compounds (VOCs) as precursors to ozone formation under section 302(s) of the Clean Air Act (CAA) and 40 CFR 51.100(s). While all VOCs have the ability to react in the atmosphere to form ozone, some VOCs react at such a slow rate their contribution to ground-level ozone is negligible. Through regulation, the Agency can exempt negligibly reactive compounds from the definition of VOCs. VOCs that are exempted from the CAA definition are no longer necessary to control in state implementation plans for attaining the national ambient air quality standard for ozone. This rule would address whether EPA should exempt methyl iodide based on its reactivity. This compound is used as a pesticide.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
53	Malfunction Amendments to Part 63 Standards	Pre-proposal; target date for NPRM December 2010	TBD	Proposes to amend regulations in the General Provisions of regulations promulgated under the Clean Air Act (subpart A of Part 63) that provide for or are related to an exemption from the requirement to comply with Clean Air Act section 112 emission standards during startup, shutdown, and malfunction (SSM) events.	General provisions not specific to any source category; apply when incorporated into source category-specific standards
54	Residual Risk and Technology Review: Primary Lead Smelting	Pre-proposal; NPRM expected February 2011	TBD	This action is the Risk and Technology Review (RTR) for Primary Lead Smelters. It will address both EPA's obligation under Clean Air Act (CAA) section 112(f)(2) and 112(d)(6) to conduct a residual risk review and to conduct a technology review. Under the "technology review" provision of CAA section 112, EPA is required to review maximum achievable control technology (MACT) standards and to revise them "as necessary (taking into account developments in practices, processes and control technologies)" no less frequently than every 8 years.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
55	Oil and Natural Gas Sector -- New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants, and Control Techniques Guidelines	Pre-proposal stage; NPRM projected February 2011	TBD	New Source Performance Standards (NSPS) regulate criteria pollutants from new stationary sources. Two NSPS (subparts KKK and LLL) for the oil and natural gas industry were promulgated in 1985. Section 111 of the Clean Air Act (CAA) requires that NSPS be reviewed every 8 years and revised as appropriate. This action will include the required reviews under sections 111 and 112. The development of control techniques guidelines (CTG) for criteria pollutants will also be done under this action. Because the existing regulations are narrow in scope, the reviews will include consideration of broadening the scope of operations and emission points covered by the NSPS, MACT, and the companion CTG.	TBA
56	National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-fired Electric Utility Steam Generating Units	Pre-proposal stage NPRM projected March 2011	TBD	Responds to 2008 vacatur of 2005 rule requiring mercury emissions reductions from Electric Utility Steam Generating Units by imposing new reduction scheme.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
57	Industrial-Commercial-Institutional Steam Generating Units (a.k.a. NSPS for Electric Utilities and ICI Boilers)	Pre-proposal stage NPRM projected March 2011	TBD	This action will amend the NOx, SO2, and PM standards in the utility NSPS and assure proper monitoring. Conforming amendments to the industrial boiler NSPS will also be proposed to assure consistent monitoring for the various boiler rules. In addition the action will make multiple corrections to the boiler NSPS. It will also respond to the Utility Air Regulatory Group's (UARG) request for reconsideration of the January 2009 final amendments to the boiler NSPS. Issues specific to UARG's request include: 1) appropriate monitoring provisions for owners/operators of affected facilities subject to an opacity standard, but exempt from the requirement to install a continuous opacity monitoring system, and 2) the relevance of an opacity standard for owners/operators of affected facilities using a continuous emissions monitoring system.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
58	Review of the National Ambient Air Quality Standards for Particulate Matter	NPRM projected March 2011	TBD	EPA is required to review and, if appropriate, revise the air quality criteria for the primary (health-based) and secondary (welfare-based) national ambient air quality standards (NAAQS) every 5 years. On October 17, 2006, EPA published a final rule to revise the primary and secondary NAAQS for particulate matter to provide increased protection of public health and welfare. EPA initiated the current review in 2007 with a workshop to discuss key policy-relevant issues around which EPA would structure the review. This review includes the preparation of an Integrated Science Assessment (ISA), Risk/Exposure Assessment (REA), and a Policy Assessment (PA) by EPA, with opportunities for review by EPA's Clean Air Scientific Advisory Committee and the public. These documents inform the Administrator's decision as to whether to retain or revise the standards. The ISA was completed	TBA

				in December 2009, the final REAs for health risk assessment and visiblity assessment were finalized in June and July 2010, respectively. The first draft PA was reviewed by CASAC on April 8-9, 2010. The second draft Policy Assessment was reviewed by CASAC on July 26-27, 2010.	
59	Revision of New Source Performance Standards for New Residential Wood Heaters (a.k.a. NSPS Revisions for Residential Wood Heaters)	NPRM projected June 2011	TBD	Proposes revising the New Source Performance Standards (NSPS) for residential wood heaters under the Clean Air Act Section 111(b)(1)(B). This rule is expected to require manufacturers to redesign wood heaters to be cleaner and lower emitting. The revisions are also expected to retain the requirement for manufacturers to contract for testing of model lines by third-party independent laboratories, report the results to EPA, and label the models accordingly. This action does not apply to existing residential woodstoves, pellet stoves and other residential biomass heating units.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
60	Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur	NPRM projected July 2011	TBD	Under the Clean Air Act, EPA is required to review and, if appropriate, revise the air quality criteria for the primary (health-based) and secondary (welfare-based) national ambient air quality standards (NAAQS) every 5 years. On October 11, 1995, EPA published a final rule not to revise either the primary or secondary NAAQS for nitrogen dioxide (NO2). On May 22, 1996, EPA published a final decision that revisions of the primary and secondary NAAQS for sulfur dioxide (SO2) were not appropriate at that time, aside from several minor technical changes. On December 9, 2005, EPA's Office of Research and Development (ORD) initiated the current periodic review of NO2 air quality criteria with a call for information in the Federal Register (FR). On May 3, 2006, ORD initiated the current periodic review of SO2 air quality criteria with a call for information in the FR. This review includes the preparation of	TBA

				an Integrated Science Assessment, Risk/Exposure Assessment, and a Policy Assessment Document by EPA, with opportunities for review by EPA's Clean Air Scientific Advisory Committee and the public. These documents inform the Administrator's proposed decision as to whether to retain or revise the standards. This review will be limited to only the secondary standards; the primary standards for SO2 and NO2 are being reviewed separately.	
61	NESHAP Risk and Technology Review for Pulp and Paper Industry and Chemical Recovery Combustion Sources, and NSPS review for Kraft Pulp Mills	Pre-proposal; NPRM projected June 2011	TBD	The 2004 National Academy of Sciences' (NAS) report recommended that EPA begin conducting integrated assessments that consider multiple pollutants (criteria and hazardous air pollutants, and other chemicals that may be of concern) and multiple effects (health, ecosystem, visibility) to set standards and develop planning and control strategies. In response to this recommendation, EPA's Office of Air Quality Planning and Standards (OAQPS) intends to conduct an integrated review and assessment that addresses regulatory obligations under both the National Emission Standards for	TBA

				Hazardous Air Pollutants and the New Source Performance Standards programs (NSPS). Section 112(f)(2) of the Clean Air Act (CAA) directs EPA to conduct risk assessments on each source category subject to maximum achievable control technology (MACT) standards, and to determine if additional standards are needed to reduce residual risks, to be completed 8 years after promulgation. Section 112(d)(6) of the CAA requires EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, to be done at least every 8 years. The NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills (Subpart MM) was promulgated in 2001 and has not been reviewed. Similarly, the NESHAP for the Pulp and Paper Industry (Subpart S) was promulgated in 1998 and also has not been reviewed. Section 111(b)(1)(B) of the CAA mandates that EPA review and, if appropriate, revise existing New Source Performance Standards (NSPS) at	

				least every 8 years. The Kraft Pulp Mill NSPS was promulgated in 1978 and is in need of review. This NSPS component of this action will include reviewing existing emission limits for particulate matter, total reduced sulfur, and opacity and evaluating the appropriateness of developing emission limits for other pollutants such as sulfur oxides, nitrogen oxide, and carbon dioxide.	
62	NESHAP Subpart W: Standards for Radon Emissions From Operating Uranium Mill Tailings: Review (a.k.a. NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W))	Pre-proposal initiated June 13, 2008 Projected date to publish NPRM August 2011	TBD	NESHAP Subpart W protects human health and the environment by setting radon emission standards and work practices for operating uranium mill tailings impoundments. EPA is in the process of reviewing this standard. If necessary, we will revise the NESHAP requirements for radon emissions from operating uranium mill tailings.	TBA

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
63	Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Inclusion of Fugitive Emissions; Final Rule; Stay	Stay effective through October 2011	Administration concludes this action not a significant regulatory action under the terms of Executive Order 12866.	Provides for an 18 month stay of a 2008 final rule revising requirements of the major NSR programs regarding the treatment of fugitive emissions, which required these emissions to be included in determining whether a physical or operational change results in a major modification only for sources in industries that have been designated through rulemaking under section 302(j) of the CAA. The final rule amended all portions of the major NSR program regulations: permit requirements, the PSD program, and the emission offset interpretive ruling. EPA has stayed the rule pending a reconsideration proceeding.	Rule affects all industry groups. The majority of sources potentially affected are expected to be in the following industry groups: Electric Services; Petroleum Refining; Industrial Inorganic and Organic Chemicals; Natural Gas Liquids; Pulp and Paper Mills; Automobile Manufacturing; Pharmaceuticals; Mining; Agriculture, Fishing and Hunting
64	Residual Risk and Technology Review Amendments to the Secondary Aluminum Production NESHAP (a.k.a. NESHAP RTR for Secondary Aluminum Production (subpart RRR))	NPRM projected December 2011	TBD	A secondary aluminum production facility means any establishment using clean charge, aluminum scrap, or dross from aluminum production, as the raw material for processing. The existing 40 CFR Part 63, Subpart RRR National Emission Standards for Hazardous Air Pollutants (NESHAP) for Secondary Aluminum Production facilities was promulgated in 2000.	TBA

				This rule regulates Hazardous Air Pollutants (HAP) from facilities that are major sources of HAP that operate aluminum scrap shredders, thermal chip dryers, scrap dryers/delacquering kilns/decoating kilns, group 2 furnaces, sweat furnaces, dross only furnaces, rotary dross coolers, and secondary aluminum processing units (SAPUs). SAPUs include group 1 furnaces and in-line fluxers. Area sources of HAP are regulated only with respect to emissions of dioxins/furans (D/F) from thermal chip dryers, scrap dryers/delacquering kilns/decoating kilns, sweat furnaces, and SAPUs. Facilities subject to these rules were required to be in compliance by March 2003. Section 112(f)(2) of the Clean Air Act (CAA) directs EPA to conduct risk assessments on each source category subject to maximum achievable control technology (MACT) standards and determine if additional standards are needed to reduce residual risks. The section 112(f)(2) residual risk review	

				is to be done within 8 years after promulgation. Section 112(d)(6) of the CAA requires EPA to review and revise the MACT standards, as necessary, taking into account developments in practices, processes, and control technologies. The section 112(d)(6) technology review is to be done at least every 8 years. These risk and technology reviews for secondary aluminum production facilities will be conducted in this rulemaking, which will address possible residual risks, technology advancements, and technical deficiencies in the existing rule.	
65	Implementing periodic monitoring in federal and state operating permit programs (a.k.a. CAM - Compliance Assurance Monitoring Rule (Part 64))	Initiated August 2002 Proposed rule target date December 2011	TBD	Revises the existing Compliance Assurance Monitoring rule (40 CFR part 64) to be implemented through the operating permits rules (40 CFR Parts 70 and 71). The revised CAM rule would define when periodic monitoring must be created for sources to use in determining compliance status relative to applicable requirements (e.g., emissions limits).	TBA
66	National Emission Standards for Hazardous	NPRM comment period	TBA	In August 2002, the Agency received a petition to remove certain	TBA

	Air Pollutants for Stationary Combustion Turbines- Petition to Delist (a.k.a. CAM - Compliance Assurance Monitoring Rule (Part 64))	closed April 2004. (Stay effective August 2004) Final rule publication projected November 2012		types of stationary gas-fired combustion turbines from the list of hazardous air pollutant sources under Section 112(c) of the Clean Air Act. Rule proposes a partial granting of the petition by proposing to delist 4 subcategories of stationary gas-fired turbines in April 2004. Simultaneously, the Agency proposed a stay of the effectiveness of the combustion turbine maximum achievable control technology (MACT) for new sources in those subcategories of turbines, delaying the imposition of control requirements for the proposed delisted new turbines until a final action is taken regarding the delisting. The Agency is waiting until the completion of the final Integrated Risk Information System (IRIS) assessment for formaldehyde before taking final action on the petition. The final IRIS action on formaldehyde is expected to occur in Fall 2011.	

	Regulation	Status	EPA Cost Estimates	Description	Potentially Regulated Entities
67	Residual Risk and Technology Review Amendments to the Phosphoric Acid and Phosphate Fertilizer Production NESHAPs (a.k.a. NESHAP RTR for Phosphoric Acid and Phosphate Fertilizer)	Pre-proposal NPRM anticipated January 2013	TBD	Phosphate rock is the primary raw material for phosphoric acid, which in turn is the raw material for phosphate fertilizer. These 2 rules are grouped together because their production processes are usually located at the same facility. Part 63 NESHAPs for phosphoric acid and phosphate fertilizer (subparts AA and BB, respectively) were promulgated in June 1999. Facilities subject to these rules were required to be in compliance by June 2002. The Clean Air Act requires EPA to address the risk remaining to the public (ie. a 'risk review') within 8 years after promulgation of the MACT standards. EPA must also conduct a technology review of the source categories within 8 years to determine whether new technology exists to reduce emissions of hazardous air pollutants (HAP) below the levels established by the MACT standards. For purposes of expediency, these 2 reviews are combined together and called a risk and technology review. The amendments will address both risk reduction and technology advancement for the phosphoric	TBA

				acid and phosphate fertilizer source categories. There are no known small businesses in this source category.	
68	Review of the National Ambient Air Quality Standards for Ozone (a.k.a. Ozone NAAQS Review)	NPRM projected May 2013	TBD	EPA is required to review and, if appropriate, revise the air quality criteria for the primary (health-based) and secondary (welfare-based) national ambient air quality standards (NAAQS) every 5 years. On March 23, 2008, the EPA published a final rule to revise the primary and secondary NAAQS for ozone to provide increased protection of public health and welfare. EPA initiated the current review in October 2008 with a workshop to discuss key policy-relevant issues around which EPA would structure the review. This review includes the preparation of an Integrated Science Assessment, Risk/Exposure Assessment, and a Policy Assessment Document by EPA, with opportunities for review by EPA's Clean Air Scientific Advisory Committee and the public. These documents inform the Administrator's proposed decision	TBA

				as to whether to retain or revise the standards.	
69	Review of the National Ambient Air Quality Standards for Lead (a.k.a. Lead NAAQS Review)	Pre-proposal initiated June 2010 NPRM projected December 2013	TBD	EPA is required to review and if appropriate revise the air quality criteria for the primary (health-based) and secondary (welfare-based) national ambient air quality standards (NAAQS) every 5 years. On November 12, 2008, EPA published a final rule to revise the primary and secondary NAAQS for lead to provide increased protection for public health and welfare. The review began in May 2010 with a workshop to discuss key policy-relevant issues around which EPA would structure the review. This review includes the preparation of an Integrated Science Assessment, and, if warranted, a Risk/Exposure Assessment, and also a Policy Assessment Document by EPA, with opportunities for review by EPA's Clean Air Scientific Advisory Committee and the public. These documents inform the Administrator's proposed decision as to whether to retain or revise the standards.	TBA

ONE HUNDRED ELEVENTH CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON ENERGY AND COMMERCE

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October 14, 2010

The Honorable Lisa Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: Costs Estimates for Clean Air Act Regulations

Dear Administrator Jackson:

On September 28, 2010, the Congressional Budget Office (CBO) issued an economic outlook which projected that under current policies the U.S. unemployment rate will remain above 8 percent until 2012, and above 6 percent until 2014. The CBO also stated that, in addition to the millions of Americans officially unemployed, many others are underemployed or have left the labor force. Given these forecasts, we believe it critical that both the Administration and Congress scrutinize those governmental policies and actions that are negatively affecting economic growth and job creation.

In this regard, we write regarding the cumulative impacts of new regulations being proposed by the Environmental Protection Agency (EPA) under the Clean Air Act (CAA). We are concerned about the highly accelerated pace at which EPA is issuing complex and expensive regulatory proposals under the CAA; the ability of businesses to read, understand, and comment on the thousands of pages of proposed new rules before they are finalized by EPA; and the ability of the persons or entities regulated by the new rules to implement them at the rate at which they are being promulgated. We are also concerned about the billions of dollars in new costs, as well as the workability of a number of the proposed new rules. Finally, we are concerned the Administration is moving forward without fully considering the economic and job impacts of the new regulations. Just as appropriate implementation of the Clean Air Act is essential for protecting the public health, appropriate consideration of the economic and employment impacts of regulations under the Act is essential for protecting the nation's economic health.

To assist Congress and the public in understanding the extent of EPA's current rulemaking activity under the CAA, we have attached a chart which identifies approximately 40 proposed or final CAA regulations, including greenhouse gas regulations, revised air quality standards, and other regulatory proposals under the CAA, as well as many regulations in the pre-proposal stages. The chart includes EPA's own compliance cost estimates to the extent they are available. At least eight of the proposed or final rules included have compliance costs estimated by EPA to exceed $1 billion each. It appears that collectively the Administration's new or proposed CAA regulations could impose billions of dollars of additional new costs annually on U.S. businesses as the new rules are implemented by your agency.

To assist us in assessing the cumulative economic and job impacts of the recent and pending CAA regulations, we ask that you provide responses to the following questions:

1. Are the EPA compliance cost estimates included in the attached chart accurate? If not, for each estimate EPA believes is not accurate, please provide EPA's projected compliance cost.

2. Are there additional pending CAA regulations that are not included in the attached chart that EPA estimates will impose annual compliance costs of $100 million or more? If yes, please identify and provide the Federal Register docket number for each such regulation if available.

3. Are there any additional CAA regulations that are not included in the attached chart that EPA is currently considering initiating? If yes, please identify each of those potential CAA rulemakings, and indicate whether the rulemaking could impose new compliance costs, and whether the costs could be more than $100 million annually.

Please provide the written responses and documents requested by no later than two weeks from the date of this letter. Should you have any questions, please contact the Minority Committee staff at (202) 225-3641.

Sincerely,

Joe Barton
Ranking Member

Michael C. Burgess
Ranking Member
Subcommittee on Oversight and Investigations

Enclosure

cc: The Honorable Henry A. Waxman, Chairman

The Honorable Bart Stupak, Chairman
Subcommittee on Oversight and Investigations

Administrator Lisa P. Jackson
National Press Club
March 08, 2010

As prepared for delivery.

I truly am grateful for the opportunity to speak about how the good people at the Environmental Protection Agency have been making history.

We've restored the rightful place of science as the first factor in all of our decisions; developed and implemented rules that will protect children, keep people healthy and save lives; and taken long-overdue action on climate change, including a revolutionary clean cars program built on the historic finding that greenhouse gas pollution endangers public health and welfare.

On that last point, the overwhelming scientific evidence was recently met with arguments that Washington DC experienced an unprecedented blizzard and record snowfalls this winter – as if an unexpected change in our climate somehow disproves climate change.

Today I want to talk about a misconception that threatens to do more harm to our progress as a nation than the carping over climate science. And that's the misconception that we must make a choice between cleaning up our environment and growing our economy.

I've worked in environmental protection for 20 years. I've seen meaningful environmental efforts met time and again with predictions of lost jobs and lost revenue. Lobbyists and business journals have done such a good job of engraining it into our way of thinking that many of us believe, sadly, that we must choose between our environment and our economy. The people in my line of work haven't done the best job of communicating our side in this debate. We've lost the messaging war and have work

to do to present the alternative. It helps that history and the facts bear us out. I'm here to show you today that the choice between the environment and the economy is indeed a false choice.

Well-conceived, effectively implemented environmental protection is good for economic growth. Let me repeat that: environmental protection is good for economic growth. Don't get me wrong – environmental regulations are not free. But the money that's spent is an investment in our country – and one that pays for itself.

First, environmental protection makes us healthier. It eliminates contributors to costly and often deadly diseases like asthma, cancer and heart disease.

My youngest son is one of 23 million Americans with asthma. I know the financial and emotional burdens of hospital visits and doctors appointments.

When the air is dirty, or the water is contaminated, and people are getting sick, those kinds of health costs are multiplied by millions of families. And they're a burden to small businesses trying to provide health care to their workers.

Good environmental protection is critical to our health, and because of that it's critical to our economy.

Second, environmental protection makes our communities more prosperous and our workforce more productive.

Those of you with kids in college will understand the words of man who said to me, "Businesses come to communities like parents come to colleges. They look at the environment to make sure it's healthy…They look at the people to make sure they're getting what they need to thrive… They want to know that this place means a better future…And they don't put their money down if they don't like what they see."

This is something we see all the time in our ongoing work on environmental justice. The idea that environmental degradation is an obstacle to economic prosperity is a pillar of the environmental justice movement. And in the places where new jobs are needed the most, environmental degradation is an entry barrier for new investments and businesses.

It's what we see in inner cities where air pollution makes kids miss school and workers stay home.

It's what we see on tribal lands where open landfills are rampant and drinking water is polluted. Earlier this year I met a tribal leader who told me that his community was facing 50 percent unemployment.

It's what we see in Greenville, Mississippi, which is having trouble attracting jobs because their water – even though it meets federal safety standards – runs brown.

Poison in the ground means poison in the economy. A weak environment means a weak consumer base. And unhealthy air means an unhealthy atmosphere for investments. But a clean, green healthy community is a better place to buy a home and raise a family, it's more competitive in the race to attract new businesses, and it has the foundations it needs for prosperity.

These are two reasons why our environment is essential to our economy. But what I want to focus on today is the vital role environmentalism plays for a critical driver of our economic success: our capacity for innovation and invention.

Just yesterday Thomas Friedman wrote that "America still has the best innovation culture in the world." …He immediately followed that by saying, "But we need better policies to nurture it."

That is what smart environmental protection does. It creates a need – in other words, a market for clean technology – and then drives innovation and invention – in other words, new products for that market.

This is our convenient truth: smart environmental protection creates jobs.

Now that may be a difficult idea for some folks to handle. Before I go any further, let me lay out some common ground.

Everyone wants a clean environment. 10 out of 10 Republicans want clean air to breathe. 10 out of 10 Democrats think safe water is important. Ask all 20 and they'd actually agree.

As a Boston Globe editorial put it last week, even "anti-government" protestors know it's "no fun having a tea party with contaminated water."

I receive as many letters from red states as I do from blue states – from New Bedford, Massachusetts to Tar Creek, Oklahoma.

Last year, an amendment for EPA to relocate residents away from lead pollution in Treece, Kansas was sponsored by Republican Senators Brownback, Roberts and even my good friend Senator James Inhofe.

Senator Roberts called it "one of the rare instances of true bipartisan support."

Often times the same offices that are blasting out press releases on the overreach of faceless EPA bureaucrats are also asking those same bureaucrats for help. That's a textbook example of irony and it's all too evident in today's politics. When it comes to people's health, everyone wants strong environmental protection.

Everyone also wants a strong economy. We all want robust job growth. No one favors higher costs for starting businesses or manufacturing products.

I have two teenage sons – which means I buy a lot of stuff. I am an active American consumer and the last thing I want to see are higher prices for food or utility bills or shoes or clothes.

So – we all want a clean environment. And we all want a strong economy.

What you may not realize is that we all have seen proof that we can have both.

In the last 30 years, emissions of six dangerous air pollutants that cause smog, acid rain, lead poisoning and more decreased 54 percent. At the same time, gross domestic product grew by 126 percent.

That means we made huge reductions in air pollution at the same time that more cars went on the road, more power plants went on line and more buildings went up.

The question is: How does that happen? The answer is: innovation.

Innovation is the “sweet spot” where our economic and environmental interests meet. It’s where business leaders and conservationists can come together to hash out solutions – solutions that have filled American history with environmental achievements and helped us lead the global economy.

America is home to a world-leading environmental technology industry. By conservative estimates, in 2007 environmental firms and small businesses in the US generated $282 billion in revenues and $40 billion in exports, and supported 1.6 million American jobs. And that number doesn’t include all the engineers and professional services firms that support those businesses.

Take for example New Jersey's Engelhard Corporation, which led the commercial production of the catalytic converter. If you drove here today, your car had a catalytic converter in it to burn unleaded gasoline. Today these things are standard. 30 years ago – when EPA used the Clean Air Act to phase in unleaded gas and catalytic converters – they were extremely controversial.

Many major automakers opposed them. The Chamber of Commerce claimed, and I quote, "entire industries might collapse."

Using the Clean Air Act in this way was said to be a poison pill for our economy – something that sounds all too familiar around Washington today.

Yet, the auto industry survived. Dangerous lead pollution in our air is 92 percent lower than it was in 1980. By 1985 the reductions of lead in our environment had estimated health benefits of $17 billion per year. The initial cost of the rule was paid back 10 to 13 times. And in 2006, the Engelhard Corporation was bought for $5 billion.

That's just one good example of how it works. A new environmental rule led to new innovations, which led to new jobs.

Those of you too young to remember the switch to catalytic converters may remember the phase out of ozone-depleting CFCs. CFCs were the chemicals in aerosol cans and other products that led to a growing hole in the ozone layer.

I remember a lot of people wondering if they were going to have to give up their hairspray or their deodorant – and not being too happy about it. And they weren't the only ones.

The chemical industry predicted severe economic disruption. Refrigeration companies forecasted shutdowns of supermarket coolers and chiller machines used to cool office buildings, hotels and hospitals.

Companies that used CFCs in manufacturing believed the transition would be next to impossible.

The doom-and-destruction never came to pass. Refrigerators and air conditioners stayed on.

When innovators took up the manufacturing challenge, they found alternatives that worked better than CFCs. Some developed new technology that cut costs while actually improving productivity and quality.

And by making their products better and cleaner, the American refrigeration industry actually gained access to markets overseas – giving them new economic opportunities.

These examples speak to a long history of innovation, new jobs and better health through environmental protection.

Yet, many still claim that regulation is too costly, and believe that scaling back is the best thing for growth.

We've also already seen that in action. The theory that less regulation ought to be good for the economy was put to the test in the last administration.

In that time, there was no apparent benefit for businesses or consumers. Prices on most products went up and costs of fuel increased astronomically. Any savings that may have been expected for businesses certainly didn't translate into higher wages for American workers.

In fact, the health impacts for million of Americans suffering from asthma, cancer and heart disease – coupled with the steady rise in health insurance costs – created yet another level of expense for families and businesses.

Today we are slowly but surely pulling up and out of the economic downturn. But many of our communities don't have what they need to rebuild.

It's no accident that so much of the Recovery Act is environmentally focused and no wonder that so much of it is based on clean energy innovation – the solar, wind and smart grid investments that have been made in the last year.

But clean energy and community cleanup jobs in the Recovery Act are just the beginning.

The question we face now is, what can we at EPA do to protect our environment, strengthen our communities and foster prosperity? One of the clear answers is abandoning the old disputes and working in partnership on new innovations.

Partnerships like the clean cars program – which took shape when President Obama brought together automakers, autoworkers, governors from across the country, and environmental advocates to craft an historic agreement.

Cleaner car standards will mean 950 million tons of carbon pollution cut from our skies; $3000 in savings for drivers of clean cars, and $2.3 billion that can stay at home in our economy rather than buying oil from overseas.

It will also mean new innovation.

American scientists can step up to produce new composite materials that make cars lighter, safer and more fuel efficient.

Our inventors and entrepreneurs can take the lead in advanced battery technology for plug-in hybrids and electric cars.

And manufacturers across the country can produce these new components – which they can then sell to automakers in the US and around the globe.

New environmental protections. New innovations. New jobs.

This is the direction we are moving in 2010 as well.

EPA has already proposed new smog reductions and finalized the first new NO2 standard in 35 years. We're developing air pollution standards that we know will foster new innovation – and we're working in partnership with utility companies to figure out how we get there.

We're boosting the production and use of advanced biofuels to double our use of renewables and break our dependence on foreign oil. That will benefit rural communities, spark new demand, and – with clarity on where the regulations stand – promote investments in research to expand the effectiveness and uses of renewable biofuels.

And of course, we will continue to face down our climate crisis and move into the clean energy future.

As you might expect, we're running into the same old tired arguments.

Once again industry and lobbyists are trying to convince us that changes will be absolutely impossible. Once again alarmists are claiming this will be the death knell of our economy. Once again they are telling us we have to choose: Economy? Or environment?

Most drastically, we are seeing efforts to further delay EPA action to reduce greenhouse gases.

This is happening despite the overwhelming science on the dangers of climate change…despite the Supreme Court's 2007 decision that EPA must use the Clean Air Act to reduce the proven threat of greenhouse gases…and despite the fact that leaving this problem for our children to solve is an act of breathtaking negligence.

Supposedly these efforts have been put forward to protect jobs. In reality, they will have serious negative economic effects.

The clean cars program could be put on indefinite hold, leaving American automakers once again facing a patchwork of state standards. Without a clear picture of greenhouse gas regulations, there will be little incentive to invest in clean energy jobs. America will fall further behind our international competitors in the race for clean energy innovation.

Finally, the economic costs of unchecked climate change will be orders of magnitude higher for the next generation than it would be for us to take action today.

I can't in good conscience support any measure that passes that burden on to my two sons, and to their children. I find it hard to believe that any parent could say to their child, "We're going to wait to act."

This debate also has us arguing over something the American people and many American businesses have already decided on.

Recent years have seen a growing grassroots environmentalism that is directly tied to our economy. Informed consumers are demanding more of their products. Business leaders are recognizing cost-savings potential of energy efficiency and sustainability – and they are putting serious money behind innovation.

This is a grassroots environmental movement that votes with its dollars.

7 in 10 consumers say they will choose brands that are doing good things for people and the planet.

74 percent believe that our companies should do more to protect our planet. And more than half of Americans will look for environmentally friendly products in their next purchase.

These changes are happening – and not on the margins of our economy. Walmart – the largest retailer in the world – has set goals to use 100 percent renewable energy; to create zero waste; and to sell healthier, sustainable products.

Two weeks ago they announced a plan to cut 20 million metric tons of greenhouse gas emissions across the lifecycle of their products in the next five years.

They made the announcement via webcast on – of all places – the website TreeHugger.com.

Proctor and Gamble – which produces Tide, Duracell and products that touch almost 3 billion people per day – is planning an announcement next week encouraging all their brands to shrink their environmental footprint.

A General Mills factory in Minnesota is recycling oat hulls from their cereals for biofuel – and saving $500,000 in fuel costs in the process.

The appropriately-named Green Giant is reducing pesticides and chemical water pollution with sustainable farming.

These are companies we all know and use – Timberland, Nike, the Gap, Best Buy, Starbucks – and they are responding to consumer demand.

Consumers want to know that their products don't have hidden health and environmental costs. Companies must respond to parents who refuse to buy bottles with BPA in them, or that leech dangerous chemicals into drinking water.

Industry can try to resist and ignore EPA, but I know – and they know – that they resist the forces of the green marketplace at their own peril.

It's time to put to rest the notion that economic growth and environmental protection are incompatible. It's time to finally dismiss this false choice.

We need a new approach that plays to America's greatest strengths of ingenuity, invention and innovation. We need to reclaim leadership in the development of new products that protect our health and our environment. And we need to capitalize on the growing green marketplace here and around the world.

That approach would be a return to basics – which is appropriate for the EPA in 2010. This year marks EPA's 40th Anniversary. When EPA began 40 years ago, the first Administrator William Ruckelshaus wrote "The technology which has bulldozed its way across the environment must now be employed to remove impurities from the air, to restore vitality to our rivers and streams, to recycle the waste that is the ugly by-product of our prosperity." That is just as true now as it was then.

We can't retreat from a rapidly industrialized planet and a global economy. We must integrate conservation and a passion for planetary stewardship into the global rush towards economic growth.

On the same token, the laissez-faire and anti-government crowd must understand that ever-expanding economic opportunity is not possible without sustainability. Without protection for the water, air and land that people depend on, we can only go so far. Without clean energy, the global economy will be running on empty within our lifetimes. It's time to stop denying that obvious truth, stop playing on the politics of delay and

denial, and start thinking more broadly about what is going to help us all move forward together.

Which brings me to my final point – another piece of common ground we share. We are all counting on the ingenuity and the creativity of the American people.

I'm done with the false choice between the economy and the environment. I want an EPA that is a leader in innovations that protect our health and our environment and expand new opportunities. I'm not interested in leading an agency that only tells us what we can't do. I want to work together on all the things we can do.

This is about rising to meet our most urgent environmental and economic challenges – not shrinking from them with the excuse that it's just too hard. That's never been a good enough answer for the American people.

At no point in our history has any problem been solved by "waiting another year to act" or burying our heads in the sand. Progress is made by seeing – in our greatest challenges – all the possibilities for building a healthier, more prosperous future, and bringing the best we have to offer to the table.

It's what we've done before. It's what we have to do again today. It's not something we can leave for tomorrow.

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release April 21, 2010

EARTH DAY, 2010

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BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

In the fall of 1969, Wisconsin Senator Gaylord Nelson announced plans for a national "environmental teach-in" -- one day, each year, of action and advocacy for the environment. His words rallied our Nation, and the first Earth Day, as it became known, saw millions come together to meet one of the greatest challenges of our times: caring for our planet. What Senator Nelson and the other organizers believed then, and what we still believe today, is that our environment is a blessing we share. Our future is inextricably bound to our planet's future, and we must be good stewards of our home as well as one another.

On the 40th anniversary of Earth Day, we come together to reaffirm those beliefs. We have come far in these past four decades. One year before the first Earth Day, our Nation watched in horror as the polluted and debris-choked Cuyahoga River in Cleveland, Ohio, caught fire. In response, a generation of Americans stepped forward to demand progress. What Americans achieved in the decades that followed has made our children healthier, our water and air cleaner, and our planet more livable.

We passed the Clean Air and Clean Water Acts, established the Environmental Protection Agency, and safeguarded treasured American landscapes. Americans across our country have witnessed the impact of these measures, including the people of Cleveland, where the Cuyahoga River is cleaner than it has been in a century.

We continue to build on this progress today. My Administration has invested in clean energy and clean water infrastructure across the country. We are also committed to passing comprehensive energy and climate legislation that will create jobs, reduce our dependence on foreign oil, and cut carbon pollution.

We have more work to do, however, and change will not come from Washington alone. The achievements of the past were possible because ordinary Americans demanded them, and meeting today's environmental challenges will require a new generation to carry on Earth Day's cause. From weatherizing our homes to

more

(OVER)

planting trees in our communities, there are countless ways for every American, young and old, to get involved. I encourage all Americans to visit WhiteHouse.gov/EarthDay for information and resources to get started.

The 40th anniversary of Earth Day is an opportunity for us to reflect on the legacy we have inherited from previous generations, and the legacy that we will bestow upon generations to come. Their future depends on the action we take now, and we must not fail them. Forty years from today, when our children and grandchildren look back on what we did at this moment, let them say that we, too, met the challenges of our time and passed on a cleaner, healthier planet.

NOW, THEREFORE, I, BARACK OBAMA, President of the United States of America, by virtue of the authority vested in me by the Constitution and the laws of the United States, do hereby proclaim April 22, 2010, as Earth Day. I encourage all Americans to participate in programs and activities that will protect our environment and contribute to a healthy, sustainable future.

IN WITNESS WHEREOF, I have hereunto set my hand this twenty-first day of April, in the year of our Lord two thousand ten, and of the Independence of the United States of America the two hundred and thirty-fourth.

BARACK OBAMA

# # #

United States Senate
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6175

April 7, 2010

Bill A. Roderick
Acting Inspector General
Environmental Protection Agency
Office of Inspector General
1200 Pennsylvania Avenue, N.W. (2410T)
Washington, DC 20460

Re: Request to conduct an investigation of the Data Quality Act procedures and Peer Review process employed by EPA in Developing the Endangerment Finding for Greenhouse Gases

Dear Mr. Roderick:

On December 15, 2009 EPA published in the Federal Register a final rule, "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act" (74 Fed.Reg. 66496 (Dec. 15, 2009)) ("Endangerment Finding"). After a review of the rulemaking docket, the preamble, EPA's Responses to Comment Documents, and the Technical Support Document ("TSD"), I have a number of concerns related to EPA's compliance with the Data Quality Act and whether EPA followed its own peer review procedures. As you know, reproducibility is a key component of the Office of Management and Budget's (OMB), as well as EPA's, guidance on information quality. OMB provides that "agency guidelines shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public."[1] For example, on a separate proposal concerning greenhouse gases under the Clean Air Act, the Agency recently initiated and concluded an extensive peer review of its renewable fuels lifecycle analysis using independent third party contractors. No such effort was undertaken for the Endangerment Finding.

In light of these issues, I request that you conduct a review of the Administrator's assessment of endangerment to determine whether EPA followed key Federal and Agency regulations and policies in developing and reviewing the technical data used to make and support its endangerment finding. Specifically, you should consider whether EPA adhered to the requirements of the Data Quality Act and followed its peer review guidelines. Please consider the following areas in conducting your evaluation:

[1] 67 Fed. Reg. 8452, 8460 (Feb. 22nd, 2002).

1. EPA has stated that it relied upon the IPCC assessment reports' procedures and the belief that the reports underwent "a rigorous and exacting standard of review" that could be used as the basis for the TSD and its scientific conclusions. In relying upon the IPCC procedures, EPA implies that such procedures could be a substitute for EPA conducting its own data quality and peer review processes.

    a. Did EPA conduct an examination of the IPCC procedures, including the IPCC process for handling review comments?
    b. How did EPA determine that the IPCC process satisfied EPA's obligations to follow the Data Quality Act and the Agency's, as well as OMB's, peer review guidelines? How was this determination documented?

2. IPCC procedures require that it consider all information and scientific viewpoints. Examine how EPA evaluated and determined that the IPCC examined all viewpoints.

3. Was EPA aware of editing of final IPCC assessment reports after the reviewers submitted their final comments?

4. Was the Endangerment Finding's Technical Support Document (TSD) subjected to peer review as specified in the EPA Peer Review Handbook? If not, please provide EPA's explanation for why it was not.

5. EPA has acknowledged sending the Draft TSD to a group of federal climate change experts for review. Apparently this was done for a number of versions of the Draft TSD.

    a. Were changes made to the Draft TSD based on these federal reviewers' comments?

    b. Did this process follow EPA's, as well as OMB's, peer review guidelines?

6. Assess the Interagency review process used in developing the Endangerment Finding. Were there significant interagency comments on the finding? How were these resolved?

7. In recent months a number of e-mails from the Climatic Research Unit ("CRU") of the University of East Anglia in the United Kingdom were released. EPA has claimed that these e-mails do not affect the fundamental findings of the IPCC assessment reports. What independent analyses has EPA conducted to reach this conclusion, in particular its conclusion regarding the HadCRUT temperature data set and its relation to the other data sets used in the endangerment finding from NOAA and NASA?

If the EPA withholds any documents or information in response to this letter, please provide a Vaughn Index or log of the withheld items. The index should list the applicable question number, a description of the withheld item (including date of the item), the nature of the privilege or legal basis for the withholding, and a legal citation for the withholding claim.

Should you have any questions, please contact EPW Committee minority staff at 202-224-6176.

Sincerely,

James M. Inhofe
Ranking Member
Senate Committee on
Environment and Public Works

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV - 8 2010

THE ADMINISTRATOR

The Honorable Joe Barton
Ranking Member
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515-6115

The Honorable Michael C. Burgess
Ranking Member
Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515-6115

Dear Congressman Barton and Congressman Burgess:

Thank you for your October 14 letter about EPA's work to follow Congress's instructions in the Clean Air Act. The pace of EPA's Clean Air Act regulatory work under this administration is actually not faster than the pace under either of the two previous administrations. In fact, EPA has finalized or proposed fewer Clean Air Act rules (87) over the past 21 months than in the first two years of either President George W. Bush's administration (146) or President Clinton's administration (115).[1]

The chart attached to your October 14 letter highlights eight of EPA's current Clean Air Act rulemakings as having projected compliance costs exceeding one billion dollars. One of those rulemakings, however – the national ambient air quality standard for nitrogen dioxide – actually has projected compliance costs of only $3.6 million (your chart states $3.6 billion). Of the seven remaining rulemakings, one was initiated under the previous administration, two are in response to mandatory-duty lawsuits, and two are corrected versions of rules that were promulgated under the previous administration but then overturned in court for being inconsistent with Congress's instructions.

The chart attached to your letter does not present the projected economic benefits of any of the listed rulemakings. Those benefits projections can be found in the same documents from which the cost projections were drawn. Had the chart included the benefits projections, readers of it would have be able to see that the projected benefits of EPA's pollution reduction rules under the Clean Air Act exceed the projected costs by 13 to 1. According to the current, public

[1] All three counts include all Clean Air Act rules that amend the Code of Federal Regulations and that require the EPA Administrator's signature.

draft of an EPA report entitled "The Benefits and Costs of the Clean Air Act: 1990 to 2020,"[2] the benefits of Clean Air Act rules are expected to reach nearly $2 trillion in 2020 – exceeding costs by more than 30 to 1.

EPA's work to implement the Clean Air Act has a positive impact on employment in the United States. First of all, when we remove harmful smog and soot from the air, fewer Americans are forced to miss work due to pollution-related illnesses from which they or their loved ones suffer.

What is more, requirements to cut harmful air pollution at American facilities spur investments in the design, manufacture, installation, and operation of pollution-reducing technologies. All of those activities create jobs for Americans, and work installing or operating pollution controls on American facilities cannot be sent abroad. Many of the power plants and other facilities that will receive job-creating, pollution-reducing upgrades are concentrated in the very places that currently have the most unemployed workers.

Data from the International Brotherhood of Boilermakers indicates that the number of boilermakers in the United States increased by 6,700 – or 35 percent – from 1999 to 2001 as a result of EPA rulemakings implementing the Clean Air Act. The Institute of Clean Air Companies estimates that preparations to comply with just one of those rules have occupied approximately 200,000 person-years of labor over the past seven years.

The Department of Commerce estimates that, in 2007, environmental firms and small businesses in the United States generated $282 billion in revenues and $40 billion in exports, while supporting 1.6 million American jobs. Air pollution control equipment alone generated revenues of $18.3 billion in 2007, including exports of more than $3 billion. Thanks to the Clean Air Act and EPA's implementation of it, American manufacturing companies now lead a growing global market in air pollution reduction technology.

In sum: EPA's common-sense steps to implement the Clean Air Act result in much greater economic value than cost for Americans. The companies whose products and services bring American industry into line with the Clean Air Act's public health requirements support hundreds of thousands of American jobs. Those requirements foster global markets for American-made technologies.

EPA in the near future will complete and publish a periodic update of its regulatory agenda. At this time, the agency has identified three planned Clean Air Act rules that were not on your list but are likely "economically significant" (i.e., rules with projected benefits and/or costs greater than $100 million). One proposed rule would set air pollution limits for commercial and industrial solid waste incinerators (cost estimate $224 million; benefits estimate $240-$580 million in 2015). The second proposed Clean Air Act rule would set "Tier 3" emissions and fuel standards for motor vehicles. The third proposed rule would (in conjunction with a rule issued by the Department of Transportation) establish fuel economy and greenhouse gas emission standards for light-duty vehicles of Model Years 2017 through 2025.

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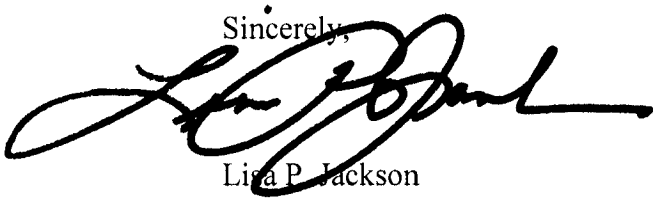
[2] http://www.epa.gov/oar/sect812/aug10/fullreport.pdf

Thank you again for your letter. If you have additional questions, please feel free to contact me or to have your staff contact David McIntosh in EPA's Office of Congressional and Intergovernmental Relations.

Sincerely,



Lisa P. Jackson

EPA	Draft Date	Final Date
Priority Rules		
Medium/Heavy-Duty Vehicle Standards	2010	2011
Light-Duty Vehicle Standards	2011	2012
MACT - Power Plants	March 16, 2011	November 19, 2011
MACT - Industrial Boilers	June 4, 2010	December 16, 2010
NSPS - Power plants	May 2011	May 2012
RCRA - Coal Ash	Summer 2010	Late 2011 - Early 2012
Air Quality Rules		
Ozone NAAQS (primary/secondary)	January 1, 2010	*November 1, 2010*
Ozone NAAQS area designations	2011	
CAIR/Transport (SO2/NOx)	June 1, 2010	2011
So2 NAAQS area designations	2011	2012
PM2.5 NAAQS Reconsideration	February 1, 2011	October 1, 2011
Haze FIP		January 15, 2011
PSD - Tailoring Rule	2010	January 2, 2010
Natural Gas Production		
RCRA - Natural Gas Production (maybe)		2011
TRI - Natural Gas Production		2011
Clean Water Rules		
Cooling Water Intake Rules	2010	July 1, 2012
EGU effluent limitation guidelines	July 1, 2010	March 1, 2014
Clean Water Restoration Rulemaking	Late 2010	2012
Mountain Top Removal		
Mountaintop Removal (maybe will happen)	2011	
Carbon Dioxide Rules		
NSPS - Nitric Acid		November 1, 2011
NSPS - Oil & Gas Production		2011
NSPS - Refineries	Fall 2010	Late 2012
NSPS - Steel		Late 2012
NSPS - Cement	August 1, 2010	
NSPS - Non-EGU boilers	2011	
Transportation Rules		
Vehicle Window Labels	September 1, 2010	2011
E-15 Blend Wall Decision	Ongoing	

OSM

Regulation of ash minefills	2011	
Stream Protection Rule	Early 2011	Mid 2012
Livable Communities Partnership+B43		

DOE

Loan Guarantee (Title 17)	Ongoing	
Clean Coal Power Initiative	Ongoing	
Industrial CCS Program (Recovery Act)	Ongoing	

USDA - RUS

Coal Plant Financing	Ongoing	
Energy Efficiency Program	Ongoing	

DOD (Budget)

Section 526 (CTL & TS Purchase)	October	
Section 313 (Jetfuel CTL)	October	

DOT

Light Duty Vehicle Standards	2011	2012
Medium/Heavy-Duty Vehicle Standards	2010	2011
New Starts/Small Starts (Transit)		

State Department

Keystone XL EIS		October 1, 2010
Keystone XL NID		January 1, 2011

BLM

Oil Shale Leasing	September 2010	
Oil Shale Rule (Settlement)		

Administrator's Public Mtg. - Waveland, MS (April 30, 2010)

Last Name:	First Name:	Phone Number(s):	Demo-graphic	Organizational Affiliation (if applicable):	Title (if offered):	Email Address (if offered):	Ideas / Issues:
Cu	Tam	no phone listed	0				
Fairbank	Bob	(b) (6) Privacy	1	Wolf River Conservation Society	President	none	What monitoring activities does the EPA conduct to evaluatet this industry. This incident points to the fact that we as a nation need to re-evaluate the safety & environmental controls we have in place for the offshore industry. Gulf energy resources are vital for the nation and we know that any interruption can havef world wide consequences. That just points to the fact we have to be more proactive with this industry. At the same time we need to more aggressively seek renewable energy sources such as wind & clean coal.
Steckler	Judy		1	Land Trust			Is willing to help out & is waiting for a call
Burrage	David		1	MS/ALSea Grant			Unsuccessful in reaching after 3 attempts.
Emmons	Rome		1	Coastal Conservation Assn - Recreation	n/a	n/a	Will help in any manner possible.
Nodine	Stephen		2	Mobile County Commissioner Alabama			Keep the communication coming. "We were doing a good job."
Perry	Steve		2	Mobile Bay NEP	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Patelo	David C.		2	Hancock County Utility Authority	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Cowand	Lisa		2	Board of Sup. District 3	Vice Pres.		Unsuccessful in reaching after 3 attempts.
Pullman	Rocky		2	Board of Sup. District 1	President		Unsuccessful in reaching after 3 attempts.
Brooks	Renee		2	Alderman, City of Pass Christian		(b) (6) Privacy	oil absorbent pads & wick and burn; open Bonne Carre spillway at Pontchartrain
Davis	Willie		2	Pass Christian	Harbor Master, Municipal Harbor	none offered	Get fishermen out to clean up spill. Can use absorbent pads that can then be picked up in trawl nets. Upset with lack of response on getting local fishermen out to help clean up spill. Says the delays caused because there is no assured funding - right now people are worried they won't get paid for helping out.
Ladner	Doyle		2	Hancock County Utility Authority			Unsuccessful in reaching after 3 attempts.
Thompkins	Jenell		2	Hancock County			Concerned for the financial livelihood of the fishermen who will be severaly hurt by this spill
Swann	Roberta		2	Mobile Bay NEP			Number is NEP office number. Will call during working hours on Monday morning

Roland	Libby Milner	(b) (6) Privacy	2	Gulfport City Council Member		(b) (6) Privacy	Suggestion: Deep water poles are all along the beach maybe 300 ft apart where sand was dredged. The boom could be attached to these poles so that the least terns and skimmers could be protected because they're in shallow water.
Ladner	Tony W.		2	Hancock Co. Board of Supervisors			Unsuccessful in reaching after 3 attempts.
Do	Bien V		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Slade	Rendon		3	Commercial Fisherman		(b) (6) Privacy	1. BP should employ all Gulf Coast fishermen to drag their nets across spill. 2. dispersants are a bad idea, will pollute the entire water column rather than just surface pollution.3. Oil Soak Fabric can be used. 4. Retrofit commercial fishermen's Ice Holes with Tanks and Oil and Water Separators. 5. Look into Microbes that will eat oil. 6. Boats can work round the clock.
Seal	Charles T.		3	Commercial Fisherman		(b) (6) Privacy	Invertor Bell is a good idea. Keep the fire burning over the thickest part of spill. Oils will keep feeding fire and burn faster. 2. Critical that the Commercial fishermen make the opening of Shrimp season. May 15 in LA, June 15 in MS. Will be devastating to fishermen if they cannot begin their work at that time.
Chrisman	Steve		3	Commercial Fisherman			Dispersants are a bad idea. Sinking oil will contaminate the entire water column. Get slick on shore as quick as possible. Affects fishermen the most if oil invades entire water column.
Livitang	John		3	Commercial Fisherman			Burlap sacks come in rolls. Wrap Burlap sacks aroung the boom. Will give them additional buoyancy. Retrofit boats with skimmer at bow of the boats. Then pump the oil into the Ice Tanks.
Epperson	William		3	Commercial Fisherman			Will think about it and call us back.
Van	Dhan Trong		3	Commercial Fisherman			Will think about it and call us back.
Nguyen	Nguyet		3	Commercial Fisherman			Unable to reach after 3 attempts, but left detailed message
Franklin	John D. Jr.		3	Commercial Fisherman			Gulf Coast Fishemen are ready to help.
Hopper	Tom		3	Oysterman			Was actually embarrassed by some of the Commercial fishermen. He is not after a paycheck. Wants to be help out in anyway he can.
Livings	John		3	Commercial Fisherman			Uable to reach after 3 attempts, but left detailed message.
Livings	Kevin		3	Commercial Fisherman			Unable to reach after 3 attempts, but left detailed message
Tha	Tran Thanh		3	Commercial Fisherman			Appreciated the Call and I informed him of the 5/2 1:00 meeting to train at Point Cadet in Biloxi.
Kidd	Thomas		3	Shrimp & Crab			Extremely appreciative of the information provided.
Wallace	Otto		3	Oysters & Shrimp			Talked to his wife and she took down my number for a call return.
Hammett	Andrew		3	Crabs, Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.

Neugen	Bien	(b) (6) Privacy	3	Captain			Talked to Cpt Neugen's Wife. Difficult to communicate, but she was going to call their daughter and get her to call me back. I talked to the daughter and gave her the information about working to help clean up the spill. She asked a lot of questions and was very appreciative of the information..
Tran	Hoang V		3	Captain			I talked to a son and a daughter of Cpt Tran. Gave them information about the meeting tomorrow night and directions to the VFW.
Alexander	Everett		3	Captain			Talked to his son. His father was at another meeting, but took my # in case he wanted to call me back.
Rando	Barry		3	Deckhand			Failed to answer. No room on the voice mail box.
Ladner	Roger		3	Crabs, Oysters & Shrimp			He was very appreciative of the follow-up and had several technical questions about the clean up and what was involved.
Johnson	Jonathan		3	Crabs, Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.
Johnson	Lawerence,		3	Crabs, Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.
Nguyen	Mai Kim		3	Ship Captain			Unsuccessful in reaching after 3 attempts.
Dao	Vang T		3	Ship Captain			Unsuccessful in reaching after 3 attempts.
Nguyen	Chi		3	Oysters & Shrimp			Had no questions or concerns
Lassabe	James		3	Commercial Fisherman	Boat Owner/Oyster/Shrimper		Burn oil; corral oil and pump it into tanks using barges
Biggs	Jerry		3	Commercial Fisherman	Boat Owner/Oyster		Set out booms and contain oil then use soak pads and skimmers to collect oil
Clark	Stephanie		3	Commercial Fisherman	Boat Owner/Seafood Company		Unsuccessful in reaching after 3 attempts.
Cark	Lamar		3	Commercial Fisherman	Boat Owner/Seafood Company		Unsuccessful in reaching after 3 attempts.
Huyuh	Trinh		3	Commercial Fisherman	Boat Owner/Oyster		Unsuccessful in reaching after 3 attempts.
Stone	Chris		3	Commercial Fisherman	Boat Owner/Crabb	(b) (6) Privacy	Line the beaches with booms before oil reaches them and attach weights to booms to keep them from washing ashore; Navy has technology to help stop the oil leak
Spaulding	James		3	Commercial Fisherman	Oyster/Shrimper		How will oil spill affect the local area? Wants a better understanding of what is happening; lack of communication and information to the public
Alexander	Thomas		3	Commercial Fisherman	Oyster/Shrimper		Unsuccessful in reaching after 3 attempts.
Ngo	Man		3	Commercial Fisherman	Shrimper		Unsuccessful in reaching after 3 attempts.
Hood	Leslie		3	Commercial Fisherman	Boat Owner	(b) (6) Privacy	Impact on not only seafood industry but also local businesses and tourism; concerned about nonlocal contractors getting work and local fishermen being left out; corral oil and use skimmers to collect it; burlap does not work
Van Le	Nhac		3	Commercial Fisherman	Boat Owner		seafood industry will be devastated

Nguyen	Tra	(b) (6) Privacy	3	Commercial Fisherman	Boat Owner		concerned about toxic water and air; are water quality and air quality samples being collected; can smell oil fumes a few miles from beach in Long Beach
Nguyen	Ha		3	Commercial Fisherman	Boat Owner		put out booms on the calm side of the barrier islands; get as many local fishermen as possible to put out as many booms as they can
Powell	James		3	Commercial Fisherman	Boat Owner/Oyster/Shrimper		Unsuccessful in reaching after 3 attempts.
Trang	Jem		3	Commercial Fisherman	Boat Owner		Unsuccessful in reaching after 3 attempts.
Nolan	David		3	Shrimper			His boat is ready to help and wondered about how he was going to live because of the oil spill.
Black	Kevin		3	Commercial Fisherman			His boat is ready to help and wondered about how he was going to live because of the oil spill. "Put us to work"
Farver	Daniel		3	Commercial Fisherman			His boat is ready to help and wondered about how he was going to live because of the oil spill. "Put us to work"
Necaise	J.C.		3	Commercial Fisherman			His boat is ready to help and wondered about how he was going to live because of the oil spill. "Use Mississippi Workers in Mississippi and is willing to go to other locations "
Bourgeois	Randy		3	Commercial Fisherman			Has a boat to use if needed for cleanup. Has expensive crabbing equipment in the water and is wondering if they covered in the waters?
Joost	Don		3	Commercial Fisherman		(b) (6) Privacy	I would like to use your boat to help cleanup. Is willing to volunteer. What about the future. I live here and I care about the future. "We all know that we need oil to live."
Gable	Richard		3	Commercial Fisherman			Has a boat to use if needed for cleanup. Has very expensive crabbing equipment in the water and is wondering if they are covered in the waters? Their company has 200 traps still in the water because of weather? Who is going to help. What should we do now as fisherman?
Armbrustek	Paula		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Jackson	Chris		3	Fisherman			Unsuccessful in reaching after 3 attempts.
Jackson	Howard		3	Fisherman			Unsuccessful in reaching after 3 attempts.
Ross	Earl		3	Commercial Shrimper			The agencies did not react as soon as they could. To have his shrimp boats helping to work all on the same page. "I want it cleaned up and I like to help" "We have a small navy ready to go to work"
Phan	Tai		3	Oyster Fishermen			Has a boat to use if needed for cleanup. What should we do now as fisherman?
Lesso	Jaun "Randy		3	Commercial Shrimper			His boats are ready to help and wondered about how he was going to live because of the oil spill. "We need work oneway or the other"
Ross	Robert		3	Commercial Shrimper			To see what was going to happen to us? He is a 5th generation fisherman. Has a shrimp boat available for cleanup and is worried about livelihood.
Tillman	Lewis		3	Commercial Fisherman	Jr.		Was looking for information. I worried about my lively hood. Lack of information. Who is going to help us survive?
Boroughs	Wade		3	Commercial Fisherman			Has 2 boats an would like to use the boats in the clean up effort. His busnness will suffer from the lack of service from shrimping and oyster. The fisherman have had a bad season with both shrimp and oysters and are looking for work to cleup the oil spill.

Hill	Michael	(b) (6) Privacy	3	Shrimp,Crab,Oyster, Net Fisherman		(b) (6) Privacy	Need to take advantage of greatest resource - the fishermen - who know the waters, issues. Booms are not large enough - need to be chained to islands to keep oil from getting into the MS Sound and the GIWW. The Undercurrent in the GIWW is much stronger. Keep it in out of the Sound. Triple to Quadruple the volume reported. The fishermen want to help - but BP and Spill Response Agencies are not taking advantage of the resource and acting quickly enough to keep the oil out of the estuaries. EPA says they don't know what oil will do - but the fishermen do - it's simple - the fisheries will be ruined. Get liaison with fishermen (Willie Davis or Mike Hill)l to sit down with military and direct the work and organize the fishermen in coordination. BP doesn't seem to care about the fishermen's livelihood with the same passion and concern as the fishermen. Another organizer David Nolan. Give us the resources, and let us help. Take our help now or later, but let us do what we do. Give us the booms and diesel and we'll get it down.
Connetti	Charlie		3	Fisherman		(b) (6) Privacy	Stop spraying dispersants once oil is inside the Chandeleur Islands, b/c it will kill the crabs, shrimp. Lay series of booms to attempt to stop oil from getting past barrier islands and out of the estuaries. From MRGO all the way around to MS Sound near Hancock, is bog bottom not sand, oil getting into that will not be possible to remove - don't use dispersants, let it go to the shore and remove there instead. He was the one that stood up and told everyone that this is not about Katrina - stay focused on oil spill. My boat is 58' and has used it to deploy booms behind Port Sulphur,LA. Example, last yr during menhaden season, a boat had too much menhaden in nets and nets sank, tearing, dead fish on beach, but brought out machine and scooped up fish on beach fairly quickly. Very effective.
Bourgeois	Kevin		3	Fisherman		(b) (6) Privacy	Willing to work. Crabber 3rd generation. Bay St. Louis. No other specific concerns or issues.
Sevel	Mike		3	Fisherman		none	Unsuccessful in reaching after 3 attempts.
Craig	Charles		3	Crabber		none	Wants to know when he can get back to work b/c he has bills to pay and stands to lose everything he has if he can't work. He would like to run his crab traps if there won't be any oil coming in next 2-3 days. All his crab traps are in MS state waters between Gulfport and Biloxi. Weather too rough to get out and harbors all closed.
Lesso, Jr.	Juan R.		3	Commercial Shrimper & Oysterman			Unsuccessful in reaching after 3 attempts.
NGuyen	Loe Van		3	Shrimper			Unsuccessful in reaching after 3 attempts.
NGuyen	Cang Van		3	Shrimper			Unsuccessful in reaching after 3 attempts.
NGuyen	Tung Van		3	blank		none	Had no comments or issues to convey. Will call back if he has anything.
Tillman	Bill		3	Shrimper & Oysterer		none	Got to stop the oil from getting into the Sound. Watching news, and they say oil is 45 ft deep offshore. Keep the oil from entering the Sound.
Shish	Mauro E.		3	Shrimp/Oyster/ Net Fisherman		(b) (6) Privacy	Wanted to know whether they (fishermen) can help. Just wanted to work. Attended BP meeting in Bayou LaBatre' yesterday and very dissappointed how it was run. Mayor of Bayou LaBatre didn't seem to want BP to say too much. Wanted to know if EPA was hiring, I indicated that BP and the Joint Command were leading the response effort and EPA, along with other agencies were providing support and monitoring air/water. Suggested numbers, websites for volunteering.

Rando	Barry J.	(b) (6) Privacy	3	Oyster/Shrimp Fisherman		(b) (6) Privacy	Have an oyster barge that floats in 1 ft of water. Would like to work on the cleanup. Available to work, TWIC card, Homeland Security Card, can access harbors unlike others. Works for Crystal Seas (Joe Jenkins), puts us completely out of work. Also, his boss has Peterbilt trucks. If we don't have gas to put in the boat, we can't even volunteer to help.
Joost	Timothy		3	Oyster/Shrimp Fisherman - RESOLVE		(b) (6) Privacy	Would like to offer an apology to Ms. Jackson for the way many of the fishermen acted during the meeting on Friday evening. The fishermen were complaining about welfare, and they shouldn't have. She wanted to know if anyone had any ideas on how to address the spill and cleanup. He attends MS Gulf Coast Junior College, and lives on his boat in Bayou Caddy. He would like to say that he, and others, are ready and willing to help out with their time and boats to clean up the fisheries as soon as possible. This is our livelihood. Also, said they have organized and are sending at least one fisherman to each of the meetings (BP, etc.) that are set up for volunteers and fisherman.
Travis	Mackenzie		3	Oyster/Shrimp Fisherman			Unsuccessful in reaching after 3 attempts.
Lassabe, Sr	Justin		3	Shrimp & Oysters	n/a	none offered	Lost 2 boats to Hurricane Katrina; thought the meeting went well enough; knows Joel Jewels at MS MDR.
Ross	Danny		3	Shrimper	n/a		Thanked us for the follow up call; needs work and training.
Rowe	William		3	Shrimp & Oyster	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Stork	Rodney		3	n/a	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Neal	Louis & Aud		3	Crab Fisherman	n/a		Has house & 5 kids… has already contact lawyer; $1400 house note due now!
Harris	Jerome		3	n/a	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Arebolo	Justin Paul		3	n/a	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Whitnay	Wayne		3	n/a	n/a	(b) (6) Privacy	Thought the meeting went as good as possible; very appreciative!
Dennis	Tommy E		3	Oyster Tonger			Hard of hearing; needs work as deckhand.
Tillman	Aaron		3	Shimper & Oysterman	n/a	n/a	Thanks us for the follow up calls; was at Point Cadet meeting on 5/02 and has signed up as contractor.
Evans	Fred		3	Oyster Fisherman	n/a	n/a	Has (4) boats ready (21 - 26 ft long). Thanks for the call. Please call him for any Training classes, etc.
de la Cruz	Barry		3	Oyster Fisherman			Unsuccessful in reaching after 3 attempts.
Man	Ngo		3	oysterman and shrimper		(b) (6) Privacy	Has a 30' boat and willing to work and take training

Ouang	Van La ?	(b) (6) Privacy	3	oysterman and shrimper			Unsuccessful in reaching after 3 attempts.
Watkins	Gerald		3	Crab fisherman		none	Has a 30' boat and lives on the Pearl River, He would like to work on the clean-up effort and wants to place booms to prevent oil from getting into the river.
Balius	James C		3	shrimper and oysterman		(b) (6) Privacy	Has a 50' boat with 6' draft He is ready to work and receive training
Bourgeois	Louis		3	Crab Fisherman		none	Has traps out not interested in working clean up
Page	James		3	oyster fisherman		none	Must protect the marsh, would like to be hired for cleanup work. Has 26' shallow draft boat in Pass Christian Harbor, willing to go to LA to work Please notify of any training Crew has TWIC Cards
Parker	Franklin		3	Shrimper, craber and oysterman		(b) (6) Privacy	Has a 60 by 20' boat 3.5 draft, 2- 18' boats willing to go for training and wants to work
Baker	Greg		3	shrimper		(b) (6) Privacy	Wants to be informed about future of shrimping industry. Willing to get training to work in clean up effort. Has a 60' steel Hull with 4' draft and 24' fishing boat. Suggested poogie boats as suction boats to collect oil
Toler	Rudy		3	shrimper and oysterman		(b) (6) Privacy	Willing to work and have his crew trained. Has a 53' iron boat draft 7' and 20' oyster boat 1' draft. He is worried about the dispersant causing environmental harm. Protect the Marshes not the open waters. Heard AL and LA. Fishermen are already working for BP why BP isnot talking to MS fishermen.
Jones	Timothy Jer		3	Shrimp and commercial fish		none	20 Yrs shrimping and fishing. Has a 50' boat 5' draft and 28' willing to work and take training. Pump air into leak to force oil up to surface faster so it could be collected.
Lana	yan		3	oysterman and shrimper			Unsuccessful in reaching after 3 attempts.
Phu	Tri		3	crab,shrimper and oysterman		none	wants to work and have training. 24' boat Lives in Bay St Louis
Krause	David		3	Chris Bailing/Danny Ross			Unsuccessful in reaching after 3 attempts.
Geerken	William		3	Full time Commercial crabs		(b) (6) Privacy	When the spillway is opened at Pontchartrain maybe that would help keep the oil from getting in there (might save the wetlands, but with some impact on sea life); marsh can stand fire, especially if you do it in parcels. Many people have nothing except for commercial fishing. Interested in cleanup crews. Smaller boats can get into marsh better & crabbers have small boats. TV isn't always the best answer for messages because of satellite TV (many MS fisherman can only see New Orleans TV stations).
Miller	Catfish		3	shrimper			Unsuccessful in reaching after 3 attempts.
Harris	Luke		3	Oysterman			Unsuccessful in reaching after 3 attempts.
Stapleton	Brad		3	Oysterman & shrimper			Unsuccessful in reaching after 3 attempts.
Pinkerton	Bobby		3	Oysterman & shrimper		(b) (6) Privacy	Had training on Sunday OSHA in Biloxi. Want first opportunity to help cleanup with local people instead of out of state. Worried about shrimp season.

Strong	Harold J.	(b) (6) Privacy	3	Fisherman, oysters, shrimp			don't think dispersants is necessarily a good idea because the oil is still there
Bourgeois	Charles		3	full time crabs		(b) (6) Privacy	main source of income is crabs; would like to work on cleanup efforts; picked up most of his traps 200 still left; weather too rough to save all traps; Just recovered from Katrina losing 250 traps and now this spill.
Bardar	Walter		3	crabs, oysters, shrimp; commercial fishing		(b) (6) Privacy	our boats are ready to go have track hoes & heavy equipment (barge also 16x24 and 32 foot boat); we have sand that matches the beach and has already been tested; consolidate oil with all the boats we have, private, government etc. Suck it up and out; we have a massive amount of boats; just spent $30,000 to get ready for season; hard to furnish yourself for 90 days before BP can reimburse (regular folks. poor folks can't afford this); volunteer is hard, we need job security by being paid to help quickly; may have to change jobs and leave family to go to class on lift boats (ironic that this may be BP etc.); Lost two houses in Katrina & sold land to recover; we can't afford to pay for the diesel fuel up front for 90 days to help. Has lots of pictures oystering etc. Has eight acres close to coast if needed for staging, cleaning animals.
Carver	Timothy R.		3	shrimp, crabs, oysters; owns boat			Wants to be able to get back to work full time fisherman. 32 foot boat
Erskine	John L		3	crabs, oysters, shrimp		(b) (6) Privacy	Wants to work to help with cleanup.
Nguyen	Cao T		3	crab, shimp, oysters		(b) (6) Privacy	Wants to work to help with cleanup since there is no fishing work right now. Have shrimp boat and then oysters in season
Erskine	Edward		3	crabs, oysters, shrimp			Wants to work to help with cleanup (via John Erskine).
Dennis	David		3	Shrimper/Oyserman		none	Concerned with how he is going to earn a living. Needs money to support family.
Stapleton	Brad	A	3	Shrimper/Oysterman		none	Suggested using fishermen to clean up oil. Could drag large pads off of boat booms. Wants to know why MS doe not yet have boats out -- has heard that LA already has a lot of fishermen's boats helping with spill.
Trieu	Jackie		3	shrimper			Has many bills, including a boat payment, and no money to pay those bills. Needs financial assistance.
Darda	Michelle		3	shrimper/oysteri ng/ crabber		Husband provided to someone from our office who called him	Concerned about the loss of their livelihood. Also want to help with cleanup as they have a boat, sand borrow pits and heavy equipment that could help out with cleanup efforts
Henley	Michael		3	shimper/oysteri ng/ crabber		(b) (6) Privacy	Concerned about the loss of their livelihood. Also want ot help with cleanup as they have boats and heavy equipment that could help out with cleanup efforts. Suggested putting an explosive device (bomb?) about 70 - 100 feet down in the mud next to the pipe. Maybe the weight of the ocean sediments above the blast zone would be enough to keep the oil from coming out of the hole

Harris	Mary & Garl	(b) (6) Privacy	3	Retired ex-fisherman			Says we need to be ready when the winds die down to get skimmers in operation. Used to do oil cleanup work and understands why it is not possible to do cleanup when winds are high and weather is bad
Huynh	Tam		3	Crabber		Interested in cleanup work.	Left my contact information and gave him the information for the BP/Fisherman's meeting on Monday May 3
Meuele	Tony		3	Independent Shrimper/Oyster			Unsuccessful in reaching after 3 attempts.
Shaw	Christopher		3	Independent Shrimper/Oyster	Owns 1 boat; not in water yet - works for John Erskin (on another list)	(b) (6) Privacy	How are we going to earn our living and support our families? June is a critical month because they are getting ready for shrimp season and are counting on it to make boat, house, car payments and take care of their families.
Kihneman, Sr	Timothy		3	Independent Shrimper/Oyster	Owns 1 boat	(b) (6) Privacy	He felt that the meeting was slightly premature because it is almost too soon to know the answers. He would like any information on whether the shrimp season will open at all and whether they can open oyster season back up so they can get what they can. He wants to know how to help with the clean-up - whatever it takes!!!
Wallis	Christopher		3	Independent Shrimper/Oyster			Unsuccessful in reaching after 3 attempts.
Ruhr	Ethan		3	Independent Shrimper/Oyster /Fish	Manages his Aunt & Uncle's boat		He would like information on whether the shrimp season is going to open at all and whether they can open oyster season back up so they can get what they can. He would like to know if he can get help to make boat payments and how to do that. He will not be able to volunteer unless they get assistance for fuel. He wants to know how it is going to be organized and when. He knows people who are ready to go now!
Nguyen	Chanh		3	Independent Shrimper/Oyster	Owns 1 boat	(b) (6) Privacy	His daughter, Lucy, acted as interpreter. He is very concerned about whether the seafood will be contaminated and wants to understand that and whether there will be a "banning" of seafood. They need to make boat payments and cannot if they cannot work.
Huynh	John		3	Independent Shrimper/Oyster	Owns 2 boats - 1 oyster & 1 shrimp		Didn't understand what was going on at the meeting; what will happen? He would like information on whether the shrimp season is going to open at all. He is afraid that he is going to lose his boats. He also has to pay for the boat slip rental each month.
McVag	Eugene C.		3	Oyster/Crab			Unable to reach after 3 attempts.
Nguyen	Tung Van		3	Oyster			Unsuccessful in reaching after 3 attempts.
Dang	Xi		3	Fisherman	Owns 1 boat - based in Pass Christian harbor.		They are waiting to see the impacts on all types of fishing. They are very concerned about the shrimp season at the beginning of June.
Nguyen	Can		3	Fisherman			Unsuccessful in reaching after 3 attempts.
Chung	Dat		3	Shrimper/Oyster man		(b) (6) Privacy	Needs work - have to pay for harbor, etc. Will work for BP in cleanup

No	Thang	(b) (6) Privacy	3	Oyster/Shrimper			Unsuccessful in reaching after 3 attempts.
Liebig	Roscoe		3	Shrimp boat owner & owner of bait shop		(b) (6) Privacy	Owns 3 boats - 20ft,30ft & 50ft. Knows of at least 40 boats at Pass Christiam Harbor that would work. Has an idea to corral the oil and pump it up into tanks on the boats so it could then be skimmed off. Could then filter the water to be returned. Main thing is to get something going that works. Sitting and waiting for the oil to come is not an option. Everyone wants to work - they have to work. Rumor is that BP will hire if they agree not to sue. Federal Gov't needs to look into that.
Nguyen	Tuyet		3	Shrimper- 95 ft boat		no	Has a suggestion for plugging the well. Have a pipe with 2 valves, one on each side so that you can lock or release the valves and oil can come out each side without building up pressure or can lock it off. Note: Did not speak English. Ideas were translated by wife who did not really understand the concept. Mr. Nguyen had many years experience in drilling and really wanted his ideas known.
Pham	Suong Hong		3	Shrimper/Oyster man - 45 ft boat		no	Doesn't speak English well enough to voice ideas
Truong	Brenda		3	Shrimper/Oyster man - 48 ft boat		no	No specific issues other than what others said at meeting
Nguyen	Can Cong		3	Shrimper/Oyster man- 65 ft boat		no	Very concerned about the future
Nguyen	Thanh		3	Shrimper			Unsuccessful in reaching after 3 attempts.
Seal	Clint		3	Shrimper/oyster man- 56 ft boat		(b) (6) Privacy	All the boats can have skimmers put on them and the oil can be pumped into barrels on the boats. Maybe they could be paid by the offloading, etc. All they want to do is work and be a part of helping because they have such a big stake in it. They are very worried and know there must be a way to help. He's sorry if the meeting got out of hand. They are just worried.
Franklin	John III		3	Oyster/crab/shrimper - 25 ft boat & father has 35 ft boat		(b) (6) Privacy	Need to close the bays and protect the sanctuaries so they will have a future. They can't work and hope the work will be given to the local people.
Tran	Dan		3	Shrimper/oyster man - 46 ft boat		No	Worried it will get worse. Needs to work. Hopes jobs will be for local people. Doesn't speak English well enough to voice ideas in detail.
Powell	James Than		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Vuong	Jason		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Vuong	Tommy		3	Commercial Fisherman			Could not speak English , so I spoke with his son Jimmy and he relayed the info. He said they all just want to go to work and I gave him the info re: Training for 5/2 at 1:00 at Point Cadet in Biloxi.
Huynh	Joei		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.

Huynh	Bay	(b) (6) Privacy	3	Commercial Fisherman			Talked with him. No concerns, but was interested in the BP and MS Fisherman Hotlines
Fuong	Chit		3	Commercial Fisherman			Called and he said he was interested in work and I gave him the phone # for MS fisherman to register their interest in contract work
Vo	Lenny Hai		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Ai	Huyna		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Atiere	Huynh		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Mai	Trinh		3	Commercial Fisherman			Did not have any concerns to express, but was very interested in the hot line information, which I provided.
Nguyen	Yen		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Tran	Hong		3	Commercial Fisherman			They did not have any concerns or issues at this time to relay to Adminstrator Jackson, but were interested in the hot line numbers which I provided.
Hayiuh	Trinh		3	Commercial Fisherman			Called and they hung up.Thy called back and I relayed the info but they had no comments.
Hopkins	Derek		3	Deckhand			The number written down is not in service anymore.
Hopkins	Chris		3	Deckhand			Concerned about the wildlife. And concerned about the oil destroying the fish and shrimp industry and our livelihood.
Johnson	Melonie		3	Oysterss, crab,shrimp & fish			Wants to contract out her boat to be used in the clean-up. Wants to be kept up to date on that. Wanted to know if there was going to be any assistance, i.e. food stamps during this crisis.
Johnson	Richard		3	Oysters, crabs,shrimp & fish			Wants to contract out his boat to be used in the clean-up. Wants to be kept up to date on that. Wanted to know if there was going to be any assistance, i.e. food stamps during this crisis.
Bri	Hayen		3	Oysters & crabs			Unsuccessful in reaching after 3 attempts.
Livrett	Greg		3	Shrimp			Has a 40 ft boat in the Jordan River and wants to help.
Tran	Tho Dai		3	Oysters			Language barrier, not able to communicate.
Scarborough	Chris		3	Crabs, Oysters & Shrimp			Wants to know a way to be kept up to date on the spill. Wonders why DMR closed the oyster season instead of letting them collect a few before the oil arrives.
Tran	Hien		3	Crabs			Language barrier, multiple people talking, but did indicate that they had no follow-up
Do	Bien		3	Oysters			Unable to communicate in english.
Covington	Rimmer		3	Charter Fisherman			Has several boats, including a sleeper barge and barge crane, Wants his employees toi have work
Franklin	Benjamin		3	Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.
Nyugen	Keo		3	Oysters & Shrimp			Wanted to contract to clean up. Left a number for them.
Nguyen	Hin Juan		3	Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.

		(b) (6) Privacy					
Q	Lamdan		3	Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.
Nitchie	Ricky		3	Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.
Mayne	Robert		3	Oysters & Shrimp			Unsuccessful in reaching after 3 attempts.
Bradley	Percy		3	Commercial Fisherman		(b) (6) Privacy	Didn't appreciate outside sources coming in to clean up, while we, locals, were watching
Gaudet	Robert		3	Commercial Fisherman Shrimper		(b) (6) Privacy	How will this affect shrimp & oyster season
Truong	Tuan A.		3	Commercial Fisherman		none	260 traps in the Gulf, what's going to happen to them & how can I get to them
Garlotte	Stephen		3	Commercial Fisherman		(b) (6) Privacy	Want to participate in the major cleanup
Hutcherson S	Winford		3	Commercial Fisherman		(b) (6) Privacy	There to offer services in cleaning up
Hutcherson J	Winford		3	Commercial Fisherman		none	Concerns about my livelihood & impact on the shrimping & oyster season
Sechrest	Corley		3	Commercial Fisherman LA & MS		none	Concerned about livelihood & 600 traps can't get to. Also if jobs are available for boaters
Dang	Xan		3	Commercial Fisherman		none	Wanted to see if the oil was coming this way & the impact
Tran	Chace		3	Commercial Fisherman	Boatowner & Capt	none	Need an interpreter
Miller	Joseph		3	Commercial Fisherman			Used someone's phone #, not in
Nguyen	Dac		3	Commercial Fisherman			Unable to reach after 3 attempts
Lam	Long D		3	Commercial Fisherman		none	What's going to happen with season & the future
Le	Cam		3	Commercial Fisherman			Unsuccessful in reaching after 3 attempts.
Truong	Sau		3	Commercial Fisherman	Captain	(b) (6) Privacy	In the business for 20 years what is the impact? What about compensation or use of boat for services.
Truong	Amanda		3	Commercial Fisherman	Boatowner	(b) (6) Privacy	In the business for 20 years what is the impact? What about compensation or use of boat for services. Concerned about those that don't speak English, how to communicate.
Thornhill	Mike		3	Commercial Fisherman		none	Own a 70 ft boat, fish in Alabama to Texas, & out of work. Concerned about livelihood. Need to be informed about the future. 90% of work is in Chandeleur & Breton Sound. Would like to see results of water samples,program, wildlife & Fisheries, Funds allocated to test the water & checkpoints.
Nguyen	Tommy		3	Shrimper/Oyster man	n/a	n/a	Wants to start working! Has boats. Wants training - please call.

		(b) (6) Privacy					
Livings	Drew		3	Oyster/shrimp/crab/fish	n/a	(b) (6) Privacy	Thanks so much for the call - wants to work! Needs training.
Nguyen	Thran		3	Shrimper	n/a	n/a	English limited. Needs work!
Nguyen	Thanh		3	Oysterman	n/a	n/a	Good meeting; no comment. Needs work.
Jenkins	Jennifer		3	Shrimp/Oyster	n/a	(b) (6) Privacy	Has processing plant; most concerned with getting locals to work; has 3 tugboats, 2-3 barges, cranes, forklifts, heavy equipment. Knows many of the local fishermen. Needs training!
Tran	Thu (Ms.)		3	Oyster	n/a	(b) (6) Privacy	Speaks very good English; well known in local community. Is tired of hearing mis-information; community needs work NOW. Relief is disorganized. Please keep informed of training opportunities
Bosarge	Richard		3	Shripm/Oysterman	Owner		Has steel double hull ship. Will help in any manner possible. Please call with any training information.
Van	Thanh		3	oyster, shrimp			Unsuccessful in reaching after 3 attempts.
Vo	De		3	oyster, shrimp			Unsuccessful in reaching after 3 attempts.
Vo	Quan		3	oyster, shrimp			Does not speak English; requested follow-up in Vietnamese?
Fayard	Matt		3	Oysterman & shrimp			Fishermen being hired with cleanup?; what will we do with no shrimp & oysters; how make a living; will we be compensated? Is really interested in paid work to help cleanup & prevention. Needs the work.
Ladner	Codey		3	oysterman & shrimp			no job; economy is so bad; completely shut down; worried about casino ; would like to help clean it up for work; only dependable job I have was oystering; can't pay bills; four or five boats in extended family; please hire us as deckhands for cleanup work; now just sitting at home waiting
Le	Tein Q.		3	oysterman & shrimp			Spoke to his daughter (Quin) and she was very glad I called; she is going to call her father on his cell phone and said she thought he would really want to talk with me. Gave them my work and home number. Mr. Le's daughter said he speaks English.
Tran	Chau		3	crabs			Unsuccessful in reaching after 3 attempts.
Scarborough	William		3	shrimperand oysterman		(b) (6) Privacy	Has a 65' steel draft 3', 50' fiberglass, 47' fiberglass 26' cat and 20 flat; 12 crew members all ready to work and take training
Miller	James		3	shrimper, craber and oysterman		(b) (6) Privacy	Has a 56' boat draft 6' willing to work and take training - 8 yrs experience
Lacoste	Roger		3	Oysterman - doesn't own a boat		(b) (6) Privacy	Just wants to keep up with what's happening and opportunities-Appreciative of phone numbers. Knows we're doing all we can.
Le	Kent		3	Shrimp and oyster - 2 boats - one 90 ft		No	Concerned because needs to go shrimping to pay for boats - wants to contract work. Doesn't speak English well enough to voice ideas in detail.
Tran	Sang V.		3	Shrimp/Oyster/ Crab - owns 2 boats - 42 ft and 25 ft		No	Concerned because needs to go shrimping to pay for boats - wants to contract work. Doesn't speak English well enough to voice ideas in detail.
Necaise	Louis J., Jr.		3	Crab, crab traps			Unsuccessful in reaching after 3 attempts.

		(b) (6) Privacy					
Tran	Giao		3	Independent Shrimper			Unsuccessful in reaching after 3 attempts.
Le	Kim		3	Independent Shrimper/Oyster man			His wife was contacted by our office and gave comments.
Trahn	Tam		3	Independent Shrimper/Oyster /Fish	Brother of San		Does not speak English but his concerns are the same as San Trahn's.
Trahn	San		3	Independent Shrimper/Oyster /Fish	Owns three boats; 2 oyster & 1 shrimp		He would like information on whether the shrimp season is going to open at all and whether they can open oyster season back up so they can get what they can. He would like to know if he can get help to make boat payments and how to do that. He will not be able to make his house and other payments when June comes.
Billiot	Ray		3	Independent Shrimper/Oyster /Fish	Owns 1 boat; rents another		Did not understand what was going on at meeting; what is going to happen? How will they organize to help? They are ready to switch to shrimping but they do not know if that will happen because of the oil. They want to help and they are ready NOW but no one told them what to do.
Alexandera	Lisa		3	Shrimpboat Deckhand	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Tillman	Joshua		3	none listed	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Raye	Raymond		3	none listed	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Schmidt	Michael		3	Shrimper/fisher man			Unsuccessful in reaching after 3 attempts.
Nguyen	Dung		3	Independent Shrimper			Unsuccessful in reaching after 3 attempts.
Rice	Brian		4	Shrimp, Crab & Oyster Dealer			Indicated that he had already signed up for class action litigation and wondered if that prohibited him from working for BP.
Alexander	Diane		4	Boat Owner			Talked to her son. His mother was at another meeting, but took my # in case he wanted to call me back.
Winchester	Tara		4	Crystal Seas Seafood	Dealer/Processor		Unsuccessful in reaching after 3 attempts.
Metz	Robert		4	Crab Fisherman and Seafood Dealer		none	So long lasting that economic loss will cause many fishermen to lose their businesses. Industry will be impacted significantly. Shame is MS has best crab on the market. Been selling crabs from east coast but MS best. Sport fishing will be impacted also. Had to leave the mtg b/c order issued on Friday giving 48 hrs for crab traps to be picked up. Bayou Caddy near Casino. Been there since 1980s. Did $730K gross after Katrina. Saw some oil-coated birds just off coast @ Waveland today. BP should set up emergency fund (possibly overseen by Feds and or state) to provide income to seafood industry who have lost their income as a result of the oil spill. They are already being impacted b/c they were ordered to pick up traps in 48 hrs. So essentially no more seafood income until oil spill and contamination has been resolved. Booms won't help with winds so high. No computer, lost it in Katrina and hasn't gotten replacement yet.
			4				Unsuccessful in reaching after 3 attempts.

Gunker	Jim	(b) (6) Privacy	4	Quality Poultry & Seafood	n/a	n/a	Unsuccessful in reaching after 3 attempts.
Ladner	Kelly		4	Seafood Sales; sub-contractor	n/a	(b) (6) Privacy	Thanks so much for calling and following up!
Becker	Tom		5	Charter Boat Captain	Captain	(b) (6) Privacy	Concerned with the Accuracy of the info coming out in the media. This is much more serious of a situation than is being portrayed. 2. Dispersants are a bad idea. Will affect the entire water column.
Airhart	Stephen		5	Burlap Sack Dealer			Unsuccessful in reaching after 3 attempts.
Berthelot	Gary		5	Recreational fishery; knows several others; could be a supply boat.	n/a	(b) (6) Privacy	First, wanted to express that he thought the meeting went well and was very appreciative. Suggested that the government could put many locals to work; they have airboats, jackup boat available. FAX: 228-255-3284
Tillman	Eddie		5	Yacht Owner		(b) (6) Privacy	Also offerd up the absorbent pads idea, would be towed in trawl behind the boat. Put pads in barrel(s) on back of boat. Also suggested opening up the Bonnet Carre Spillway to keep L. Pontchartrain and Borgne clear of oil. Hopefully it might help keep the MS Sound flushed and free of oil as well.
Janvier	George		5	yacht Owner		(b) (6) Privacy	Concerned for the fisherman and their livihood
Helbich	Ralph		5	AL Oil and Gas Association			Unsuccessful in reaching after 3 attempts.
Genin	Thomas		5	Shaggy's Resturant			Unsuccessful in reaching after 3 attempts.
Livings	John		5	sub-con			Spoke with Diane Altsman on Program Staff already.
Livings	Andrew		5	sub-con			Unsuccessful in reaching after 3 attempts.
Livings	Kevin		5	sub-con			Trying to find out what going on and how he can sign up to help out with the cleanup. I directed him to the MS DMR and EPA websites for more information related to volunteering.
Livings	Drew		5	sub-con			Unsuccessful in reaching after 3 attempts.
Rutloski	Bryan		5	Local Public Radio- 103.5 FM		(b) (6) Privacy	Concerned that local fishermen will not be considered for contracts, etc. Needs to be legislation to ensure help for the local people. He sent an email to Allyn Brooks-LaSure of the Administrator's staff as requested on ideas for bioremediation. Broadcast of the local public radio is being set up from a shrimp boat about 5 miles offshore from Bay St. Louis. Information will be reported on tide levels, inundation, will monitor where oil is showing up. Mr. Rutloski will send us information on meetings, etc. that he hears about.
Than	Tran	2	5				Unsuccessful in reaching after 3 attempts.
Berry	James		5				Unsuccessful in reaching after 3 attempts.
Epperson	James		5				Unsuccessful in reaching after 3 attempts.

Bradley, Jr.	Ernest	(b) (6) Privacy	5	LA & MS Seafood & Charter Licensed	n/a	(b) (6) Privacy	Set up boom system from Doe Point to Chandeleur Islands (about 12 miles). Then loop another boom towards Ocean Springs (about 20 miles). Appreciated the Friday Meeting! Apologized for the angry fishermen; is a 3rd generation fisherman; licensed in MS and LA for commercial crab/shrimp/oyster. Very Frustrated; needs to make money; and doesn't want others coming in from outside for any contract work that could go to the locals. His business website is www.msfishtails.com
Wallis	David C		5				Called. No answer, left message with my name and contact number
Black	James		6	CEEJ, Inc			Unsuccessful in reaching after 3 attempts.
Beiser	Teeny		7	Mississippi Resident			baking soda when applied to cooking oil causes some of the oil to sink in balls and the rest of it to float in balls; find a way to apply a substance similar to baking soda to the oil and then collect the balls of oil
Ladner	Cathy		7	Boat Owner			Emphasized the need to protect the Bayous and Estuaries, because they are the nurseries for our shrimp, crab, fish, etc. also, was concerned that Congressman Gene Taylor was not concerned about this oil spill, and thought it would break up naturally. She was given hot line numbers.
Saucier	Santo		7				Unsuccessful in reaching after 3 attempts.
Lyons	Jimmy		8	Alabama State Port			Unsuccessful in reaching after 3 attempts.
Herman	Edward		8	HARBOR			Katrina destroyed hundreds of homes in the low lying areas of Hancock County. Many of these have not rebuilt or have the connections to the sewer system been plugged. Concerned that oil could g et into system & the grinder pumps in particular (which often are in low elevationf coastal areas for sanitary sewer system & contaminate the wastewater treatment plant.
Bosarge	Steve		9		Commissioner MS DMR		Wants the Administrator to know that the Gulf Coast Fishing Industry are hard working :Water People". This has completely shut this industry down. The fishing community just wants to go to work, and does not want a hand out. We want to help fix it.
Dyess	Wayne		9	Balwin Alabama County Commissioner			Unsuccessful in reaching after 3 attempts.
Johnson	Chris		9	City of Waveland		(b) (6) Privacy	Only item is wants to know how to access air sampling information and results. EPA/DEQ came out on pier and collected air samples. Please send link and info to city. I suggested they access Oil Spill webpage setup at EPA.gov b/c that site should have information about air sampling.
Ruple	David		9	Grand Bay NERR			Unsuccessful in reaching after 3 attempts.
Nguyen	Peter		9	MSU Extension	fisheries Specialist	(b) (6) Privac	Has list of Mississippi fishermen and is willing to get information out to them. Try to use butterfly boats and skimmer boats to collect oil.
Cruzier	George		9	Dauphin Island Sea Lab			Unsuccessful in reaching after 3 attempts.
Martin	William		9	Harrison County BOS			Unsuccessful in reaching after 3 attempts.

San Fillipo	Pam	(b) (6) Privacy	9	Bay St Louis Fire Dept	Deputy Fire Chief	(b) (6) Privacy	Can provide support through the county EMA; could use our facility for decon & staging; training available? Have oil seperator in the drain system. Also, have training facilities that could be used.
Butts	Fred		9	Bay St Louis Fire Dept	Fire Chief		Pam San Fillipo & Fred Butts work together; see Pam's comments above.
Hinesley	Phillip		9	AL Dept of Conservation and Natural Resources		(b) (6) Privacy	Needs from Reserves/States:1. Contact for NOAA 2. Keep detailed track of personnel time related to oil spill, including volunteers and staff 3. What needs could NOAA support.
Batchelor	Julie		9	Baldwin Co. Commissioner			Unsuccessful in reaching after 3 attempts.
Fillingame	Les		9	City of Bay St.Louis	Mayor		Unsuccessful in reaching after 3 attempts.

U. S. Environmental Protection Agency
Blog Round-up

Prepared by the Office of Public Affairs

Thursday, March 14, 2013

Table of Contents

Blog Round-up
April 9, 2010

PEOPLE ARE TALKING

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With the internet, blogs, Twitter, forums - people are talking about EPA 24/7
Here's a sampling of what was said on April 8, 2010:

NOTE: To read the entire blog entry, click on underlined URL. To learn more about the blogger, click on the name/link in first line. Notes and headings are from OPA.

Lisa Jackson

Thank @LisaJackson for her bold action against mountaintop removal coal mining -
Posted by: coyotedelnm: 6:15 pm Full post: http://bit.ly/c0b9nr

Thank @LisaJackson for her bold action against mountaintop removal coal mining -
Posted by: sesEARTH: 6:00 pm Full post: http://bit.ly/c0b9nr

Thank @LisaJackson for her bold action against mountaintop removal coal mining
Posted by: RefreshbyMidori 1:15 pm Full post: http://bit.ly/9jI8oV

(Note: lots of RTs)

Open Government

Highlights of some of the other elements of the #OGD #opengov plans. From the inside.
Posted by: EllnMllr: 6:40 pm Full post: http://bit.ly/bEmWiY
(Note: Ellen Miller is with the Sunlight Foundation. Update from previous blog – see below. "For example, the Environmental Protection Agency is making citizen participation in its work the hallmark of its plan. Planned community engagement projects include everything from urban waters to solid waste and emergency response. U.S. Department of Agriculture is also ramping up its participation efforts in connection with the rules by which the nation plans its national forests.")

HuffPost: Let the Sun Shine In! US CTO on Open Government Plan and Release of Data
Posted by: RefreshbyMidori 6:03 pm Full post: http://huff.to/c3qfEI
(Note: WH Blog by Aneesh Chopra and Norman Eisen: Today marks another historic milestone in President Obama's campaign to change the way Washington works as Cabinet agencies and departments release their Open Government Plans - concrete steps to deliver a more transparent, participatory and collaborative government.)

Major Milestone Reached in Open Government Initiative
Posted by: @knightcomm: 5:15 pm Full post: http://goo.gl/fb/ytVdm

(Note: The Knight Commission on the Information Needs of Communities. "The Open Government Initiative is an important endeavor. Public information belongs to the public. The Knight Comm. has pointed out that public ownership of public information is meaningless unless government at all levels operates transparently, facilitates easy and low-cost access to public records, and makes civic and social data available in standardized formats")

Our current take on #opengov plans from agencies. Idling in the driveway:
Posted by: SunFoundation 3:15 pm http://bit.ly/aNHudc
(Note: from Sunlight Foundation – Ellen Miller)

Feedback Request - EPA Open Gov Timeline - #gov20
Posted by: opengovnews: 2:47 pm Full post: http://url4.eu/2VGz7
(Note: Opengovnews: Comprehensive coverage on Open Gov & Gov 2.0, via Eqentia's Semantic news aggregation platform – Canada)

EPA Tightens Rules on Pesticide

AP: SALT LAKE CITY - EPA tightens rules on pesticide linked to deaths: -- Federal officials have tightened regu...
Posted by: Rolonews: 3:00 pm Full post: http://bit.ly/c79mFI
(Note: The U.S. EPA says aluminum and magnesium fumigants can no longer be used near homes. The agency added other regulations about where it can be used outside and what kinds of warnings must be posted when it's been applied. EPA officials said Thursday they had planned to review the pesticide in the coming years but sped up the process after the Utah deaths. The new changes went into effect Wednesday.)

Salt Lake Tribune: FUMIGATING RODENT HOLES: EPA restricts #pesticide implicated in death of two Layton sisters
Posted by: pdjmoo: 3:40 pm Full post: http://ow.ly/1w6xQ

GHG Regulation & Climate Change

Scientific American: How Scientists Can Improve Understanding on Climate Change
Posted by: EPSclimate 6:50 pm Full post: http://bit.ly/aholqf

Financial institutions urged to combat climate change: IFC, a member of the World Bank Group, is partnering ...
Posted by: VisionairesClub: 6:56 pm Full post: http://tinyurl.com/yz5clty

OneClimate.net a new social networking space for sharing ideas and experiences on climate change -
Posted by: GREENinPDX: 5:40 pm Full post: http://www.oneclimate.net/bolivia

TSCA

Ask the EPA to support strong reform of our outdated chemical law! Take action today @saferchemicals!

Posted by: SeventhGen: 1:15 pm Full post: http://7gen.us/aOF7Qd

(Note: Seventh Generation is huge manufacturer of natural/organic household and personal-care products – 16,000 followers)

ROUND-UP OF MAJOR BLOGS

CLIMATE CHANGE/GLOBAL WARMING

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The Problem With A Green Economy: Economics Hates The Environment (*Wonk Room*)

Our guest blogger is economist James Barrett.

By Guest Blogger on Apr 8th, 2010 at 11:33 am

Economics is critical to getting decent climate legislation passed, as Nobel Prize-winning economist Paul Krugman discusses in a extended piece for the New York Times. Economists like me have always suspected that this was true, but then we also suspect that economics is critical to pretty much everything. The problem is that economics hates the environment, or at least environmental policy.

In the real world, environmental policy has been very good for the economy. But economic analyses of climate legislation find that pollution limits slow economic growth and increase costs. The Waxman-Markey climate bill — the American Clean Energy Security Act (ACES) — is a perfect example. As any good wonk will tell you, the economic analyses of ACES actually looked pretty good, especially when compared to some of the econolyptic predictions of past climate policy. The problem is that while the analyses were pretty good for ACES, they were horrible for climate policy. The analysis done by the EPA was the source of some the lowest cost estimates that anyone put out. This analysis was actually bad news.

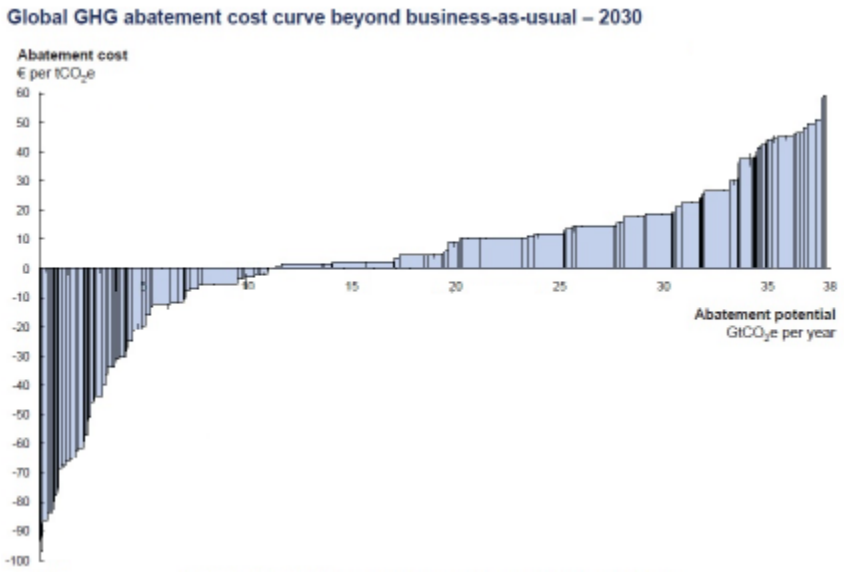
The reason why this is such bad news for climate policy is because it resonates strongly with people's fears, it reinforces the conventional wisdom that climate policy will hurt the economy, and because it's wrong.

The heart of the problem is that the economic models economists use were written, for the most part, by economists. They are based on logical economic theories that make sense to economists because, in part, they assume that everyone understands that economics is critical to pretty much everything, and act rationally as a result. Not "rational" in the sense that people understand the difference between up and down, but rational in the sense that if your boss cut your hourly wage, you would voluntarily choose to work fewer hours, even if you have a family to feed. If you take the assumptions that underlie economic rationality to their logical conclusions, they can result in a pretty strange view of the world and how it works:

SOME FALLACIES OF CONVENTIONAL CLIMATE ECONOMICS

1. **We already live in an economically optimal world**. In an economically rational world, there is no inefficiency and everyone is investing the optimal amount of money on research and development of new technologies. If a business could save money by switching to a more efficient heating and cooling system, it would have done it already. Likewise, firms are investing in energy efficiency research up to the point where an additional dollar of investment yields an expected return of one dollar in energy savings. To do less would leave money on the table, and to do more would be a waste. Anything else would be irrational. The implication of this is that, with everyone constantly and correctly optimizing their behavior, **there is nothing the government can do to make us any better off**. If everyone is investing exactly the right amount in energy efficiency, government incentives for to do more would induce people to do too much, diverting resources from other areas with a higher rate of return. This assumption is most prevalent in what are called "general equilibrium" (GE) models. As you might guess, GE models are preferred by the economic profession, yielding logically consistent if demonstrably wrong results.

2. **There can be no win-win solutions**. Since everyone is constantly optimizing their energy decisions, anything that could cut carbon emissions while simultaneously saving money or increasing profits has already been done. Emissions cuts that save money have, in economics terms, a negative price. Since no one would ever give you something you wanted and pay you for the privilege of taking it (that would be irrational even to most non-economists, I think), negative cost emissions reductions can't exist. While it might sound trivial, there is also a technical problem with this. Economic models have a hard time assimilating prices with a negative sign in front of them. So, we declare win-win solutions non-existent by fiat. The EPA analysis comes out looking so good for ACES in large part because the costs of carbon abatement are lower than in other models. But what if someone, say a big consulting firm (McKinsey & Company), went out into the real world and found that carbon abatement costs look more like this:



All those negative cost (win-win) emission reduction opportunities on the left of the McKinsey cost curve are essentially excluded from the EPA analysis — and CBO, EIA, NAM/ACCF . . . So even the most optimistic analysis of the bunch badly overstates the costs of cutting carbon. No doubt that some of these negative cost reductions require some effort to capture, which is what policy for.

3. **No one ever learns**. One thing that has bedeviled economists for a while is how to approximate what we call "induced technical change," the technical advances that occur because of policy changes or in response to price changes. If energy prices go up, you would expect that people would look for new ways to use less energy, resulting in innovations of various kinds. This makes common sense, but figuring out how it all works in the context of an economic model turns out to be pretty tricky. One attempt at this was to use the idea of "learning by doing" — the idea that the more you use of something the more efficient you get at using it. That's great, except when you plug it into a model along with a climate policy, the climate policy causes you to use less energy, and the less you use of something the less efficient you get at using it. The end result was that carbon pricing slowed innovation in carbon efficient technologies. Back to the drawing board.

Put all these together with the difficulty of parameterizing the global economy, along with a few more that get even wonkier (like how to value ecosystem loss a hundred years down the road), and the odds of getting things right starts to fall pretty rapidly. What's worse is that almost all of these problems bias the models' results in the same direction: toward higher economic costs of meeting any given reduction target.

The good news is that there are a few people working to set the record straight. I've done some work of my own on this, basically forcing a model to understand the returns to investing in efficiency. The good people at ACEEE are always on the leading edge of research on energy efficiency and have done some very good work recently on laying out the case for why and how economic models should be improved. The E3 network of economists has some excellent work related to this as well.

The bad news is that the really good work is badly outnumbered. So when Congress and other people look at the literature and see it dominated by the bad or merely unhelpful, they naturally tend to discount the other stuff as outliers, as exemplified by how the Congressional Budget Office reinforced incorrect conventional wisdom with its analysis of climate policy. The CBO basically took an average of some of the existing (flawed) work in the field and used it as their basis for figuring out the macroeconomic costs, giving the conventional wisdom an implicit stamp of approval that it doesn't deserve. As a friend of mine once said: If you're a physicist and you come up with a new theory that turns the orthodox on its head, they give you a Nobel Prize. If you're an economist, they deny you tenure.

ENERGY

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Newsweek Gets Coal Terribly Wrong (*Wonk Room*)

Our guest blogger is JW Randolph, Legislative Associate for Appalachian Voices.

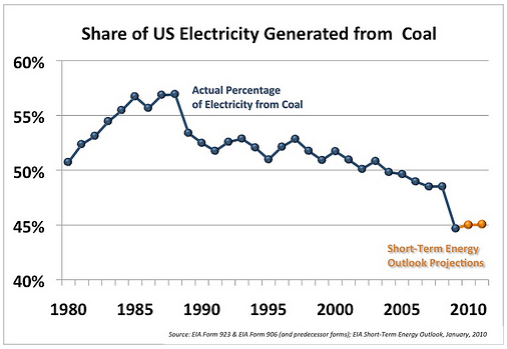
By Guest Blogger on Apr 8th, 2010 at 1:15 pm

Daniel Stone published a piece on coal and energy over Newsweek's The Gaggle called "West Virginia Mine Disaster Unlikely to Affect National Energy Debate." David Roberts at Grist responded to Energy Committee Staffer Bill Wicker for a quote he had in the article, and it's well worth the read. But the article was so full of misinformation and false pretexts that I wanted to spend some pixels correcting a few things, beginning with this paragraph:

Coal is the one fuel that powers most of what we do. It **accounts for 49 percent of American power consumption**, and as demand for power increases while the cost of alternatives (wind, solar, biofuels) remains high, **coal is poised to play a bigger, not smaller, role in our energy landscape**. To put it more crassly, the cost of coal is just too cheap. A kilowatt hour of coal power costs about $0.04, less than a third of renewables.

Facts:

A) For 2009, coal provided just 44.6% of electricity, not the 49% Stone suggests (likely from the 2008 data.) If you are looking at "energy" then it is 22-23%, much less.



B) Saying that coal is poised to play a "bigger" role is ridiculous. Coal is declining, particularly production in Central Appalachia. It has been declining for the past two decades and is projected to continue downward. But not only that. It is getting deeper, thinner, and of less quality. The heat content is in decline as well, meaning that it takes more tons of coal to produce the same amount of electricity.

C) Delivered costs of coal are wildly different in different locations and in different coal plants. Central Appalachian coal (like that in West Virginia) is the most expensive coal on the domestic market.

D) Stone uses ballpark figures for the cost of a coal plant that is already built, but renewables that are not yet built. If you are looking at building a new coal plant versus investing in renewables, the two are cost competitive, even without a price on coal pollution (EIA). In fact, except for solar, nothing even doubles the cost of coal, and that's without CCS.

E) The deeper we go for thinner seams of less quality coal, the more expensive central Appalachian coal gets and the more competitive natural gas, wind, geothermal, or biomass may look. The same is true for safety regulations. Coal companies fight them tooth and nail because safety isn't free. This has an impact on energy policy. You can't look at mining safety in a vacuum.

Secondly, I am concerned that many in the news media continually fail to appreciate the sacrifice of coal miners, whose deaths occur with alarming frequency both at home and overseas. Mr. Stone continues:

The reason safety isn't included [*in the cost of energy*] is because accidents—from mine cave-ins to oil-rig deaths—don't happen often enough for safety to become a formidable factor in the national discussion on our energy future. **What's more, the playing field isn't all that tilted**. Despite a bad week for coal miners, wind has also been fatal—14 men were killed working with wind energy in the mid '90s, and more since, according to wind-industry analyst Paul Gipe. Not to mention the risks posed by nuclear. While most sectors have undergone regulation over the past few years to root out dangerous components, the reality is that all energy sectors are still risky in many ways.

Facts:

A) Mining accidents happen all the time in the US. Over 300 people have died mining coal in the United States just in the last decade, nearly always exceeding 20 per year. It's just that there isn't always media saturation. Over 51,000 people have died mining coal in China in the same time period. That's more than 3600 times the numbers that have been "killed by wind" in just one country and in half the time span.

B) Speaking of which, Mr. Stone uses MONSTROUS false equivalency regarding the different energy sectors. He says 14 people were killed working with wind energy in the mid-90s? What does that even mean? First of all, Gipe's numbers are worldwide. That doesn't even compare to the number of deaths from mining and processing coal in the United States alone. 18 people died in accidents mining coal in the US just last year, and that was a "great" year. Add in the 10,000 US coal miners who die each decade from black lung disease, and Mr. Stone's comparison becomes even more toxic.

C) You can't look at energy in a vacuum. Policy makers certainly don't. Look at the externalized cost of what is happening to coal communities, particularly in Appalachia. Not only has coal had a negative impact on endemic Appalachian poverty, but the health costs are estimated to be more than $42 billion every year due to health impacts and life lost. There is no cost comparison. There is no risk comparison.

NRC Decision Game Changer for Nuclear Blue Ribbon Commission (*The Heritage Foundation*)

Posted April 8th, 2010 at 11:40am in Energy and Environment

The Secretary of Energy's request that the Blue Ribbon Commission on America's Nuclear Future not consider Yucca Mountain has been debatable from the beginning. After all, America's electricity ratepayers have already invested over $10 billion into the repository. And besides that, federal statute clearly states that Yucca Mountain will be the nation's repository. Whether or not that is the best policy, it is the law. Ignoring this investment and federal statute seemed like bad policy from the start.

However, the Nuclear Regulatory Commission changed what seemed to be bad policy to definitive bad policy on April 6 when it announced that it will not consider the Department of Energy's motion to withdraw its application to construct Yucca until related lawsuits, which question the legality of DOE's motion, are settled. Given that such lawsuits could take years to resolve, ignoring Yucca in light of this development would undermine the Commission's

credibility. The fact is that the Commission could well finish its safety review and be prepared to authorize Yucca's construction by the time the courts finish their business and if the courts decide that DOE's motion is illegal, then any Commission recommendation that ignores Yucca would be moot.

That is not to say that the Commission was not going to consider Yucca anyway. It is made up of inquisitive professionals who clearly want to resolve a decade old problem and it is staffed by extremely intelligent and able individuals. That said, the Secretary's charge to not consider Yucca comes with considerable weight and the Commission surely would prefer to follow his guidance. However, the NRC's decision should provide the Commission with adequate justification to respectfully decline the Secretary's request to ignore Yucca.

Considering Yucca, however, does not mean recommending Yucca. The Commission should first come to a conclusion about Yucca Mountain's viability. If it determines that Yucca is not technically viable, then it should simply defend that conclusion. However, if the commission concludes that it is viable and still determines that Yucca Mountain is not fit for nuclear waste disposal, then it should also state why that site should not be part of a comprehensive national nuclear waste disposition strategy and put forth a detailed recommendation on how to disengage from the program.

On the other hand, the Commission could well conclude that Yucca is feasible and should be considered. Under this scenario, the Commission could bring high value to the debate but putting forth recommendations on how to ameliorate the underlying issues that have stifled Yucca's progress, such as how to make Nevada a true partner in the process. One idea might be to consider making the license available to a third party, such as a private sector non-profit or even the state of Nevada. The new license holder could then negotiate a workable solution that would fully represent the interests of all parities. This process of negotiation was absent from the original decision to name Yucca the waste repository site. If no workable path forward is developed, then Yucca dies on Nevada's terms. If an agreement could be reached, then Nevada could enjoy the many economic benefits of hosting such a facility.

By slowing the Administration's sprint to kill Yucca Mountain, the NRC has provided all parties an opportunity to think through the best policy solution moving forward. The Blue Ribbon Commission should grasp this opportunity to provide a truly comprehensive set of recommendations. Only by considering all options will the Commission truly be able to put the best set of recommendations forward.

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United States Senate
WASHINGTON, DC 20510

September 24, 2010

The Honorable Lisa Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building, Mail Code: 1101A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Jackson:

We are writing to express our concern about the EPA's proposed Maximum Achievable Control Technology (MACT) rules, including the so-called Boiler MACT and CISWI MACT, which were published in the Federal Register on June 4, 2010. As our nation struggles to recover from the current recession, we are deeply concerned that the pending Clean Air Act boiler MACT regulations could impose onerous burdens on U.S. manufacturers, leading to the loss of potentially thousands of high-paying jobs this sector provides. As the national unemployment rate hovers around 10 percent, and federal, state, and municipal finances continue to be in dire straits, our country should not jeopardize thousands of manufacturing jobs. The flow of capital for new investment and hiring is still seriously restricted, and the projected cost of compliance could make or break the viability of continued operations. Both small and large businesses are vulnerable to extremely costly regulatory burdens, as well as municipalities, universities and federal facilities.

The EPA's regulatory analysis understates the significant economic impacts of the proposed rule. For example, the impact will be substantial to small businesses, such as sawmills, which have large boilers. In addition, EPA has concluded that no additional large biomass fired boilers will be built in the United States, indicating the cessation of the domestic biomass industry. As a result, we are rightly concerned that the proposed standards appear to create serious obstacles to the development of biomass energy projects, which have the potential to significantly reduce air pollution and production of greenhouse gases. Further, we are concerned that if adopted as currently proposed, the boiler MACT rules would discourage the current use of wood biomass in wood, pulp, and paper facilities, and most likely result in significant job losses in these industries. While we support efforts to address serious health threats from air emissions, we also believe that regulations can be crafted in a balanced way that sustains both the environment and jobs.

In Section 101 of the Clean Air Act, Congress declared that one of the fundamental purposes of the Act is "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." Congress provided EPA with discretion in certain areas to carefully design regulations that protect health and the environment while promoting the productive capacity of the nation. We are writing today to ask that you exercise this discretion in completing the MACT rulemakings. We understand that the Boiler MACT rule alone could impose tens of billions of dollars in capital costs at thousands of facilities across the country. The CISWI rule would have devastating impact on the biomass industry. Thus, we appreciate your willingness, as expressed in your

responses to previous Congressional letters, to consider flexible approaches that appropriately address the diversity of boilers, operations, sectors, and fuels that could prevent severe job losses and billions of dollars in unnecessary regulatory costs.

To help reduce the burden of the rule in a manner that does not compromise public health and safety, we believe EPA should consider exercising the "health threshold" discretion that Congress provided under Section 112(d)(4) of the Act. Under this section of the law, for emissions that are considered safe to human health in concentrations that fall below an established threshold, EPA may use this risk information to set emissions standards. In reaching your final decision, we ask that you carefully consider the extensive record that supported the Agency's determination to include health-based emissions limitations for hydrogen chloride and manganese in the previous Boiler MACT rulemaking that was set aside by the reviewing court on wholly unrelated grounds.

EPA also should use a method to set emissions standards that are based on what real world best performing units actually can achieve. It is our understanding that the EPA emissions database does not truly reflect the practical capabilities of controls or the variability in operations, fuels and testing performance across the many regulated sectors and boilers, especially in light of the proposal's reliance on surrogates, such as carbon monoxide – a pollutant with wide variability in actual boiler operation especially from biomass-fired boilers. In addition, the Clean Air Act also provides EPA with broad discretion to subcategorize within a source category based on size, type and class of source to help ensure that the emission limitations are determined based on what real world best performing units can ultimately achieve in practice. We do not believe that EPA has fully exercised its responsibility to subcategorize the numerous types and combinations of boilers and fuels. In particular, we urge you to carefully consider how the regulations can promote energy recovery from renewable, alternative fuels such as biomass. Finally, we urge you to consider how work practices for all gas-fired units, such as biogas and land fill gas fired boilers, could avoid the increase in emissions (e.g., NOx and CO2) and energy use that would result from the numerous control technologies required with no guarantee of actually achieving the emission limits.

As EPA turns to developing final MACT rules, we hope you will carefully consider these recommendations and comments to protect the environment and public health while fostering economic recovery and jobs.

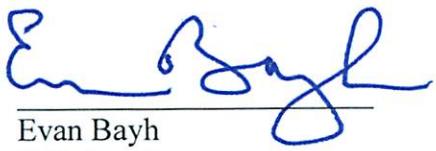
Sincerely,

Mary L. Landrieu
U.S. Senator

Susan M. Collins
U.S. Senator

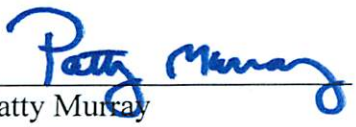
Ron Wyden
U.S. Senator

Lamar Alexander
U.S. Senator

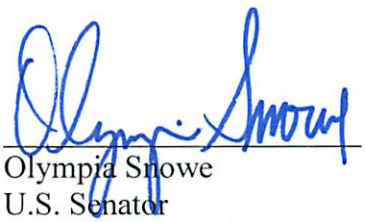


Evan Bayh
U.S. Senator

George V. Voinovich
U.S. Senator

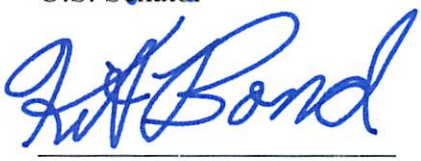


Patty Murray
U.S. Senator



Olympia Snowe
U.S. Senator

Blanche Lincoln
U.S. Senator

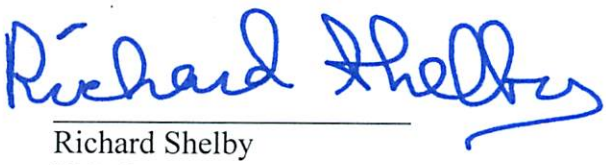


Kit Bond
U.S. Senator

Robert Casey
U.S. Senator

Bob Corker
U.S. Senator

Amy Klobuchar
U.S. Senator



Richard Shelby
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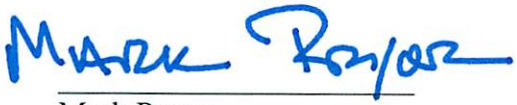
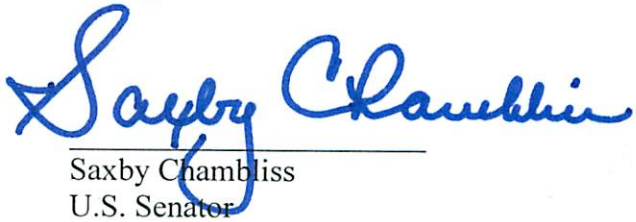


Mark Pryor
U.S. Senator

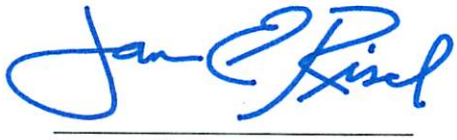
Roger Wicker
U.S. Senator

Mark Begich
U.S. Senator



Saxby Chambliss
U.S. Senator

Claire McCaskill
U.S. Senator



James Risch
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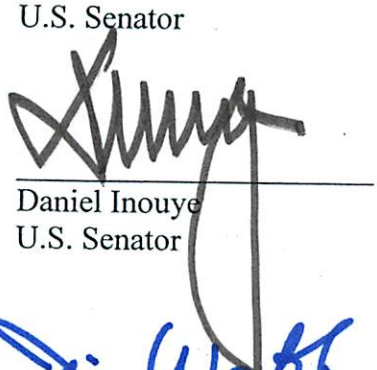
Mark Warner
U.S. Senator

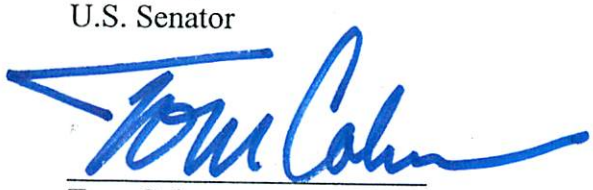
Richard Burr
U.S. Senator

Barbara Mikulski
U.S. Senator

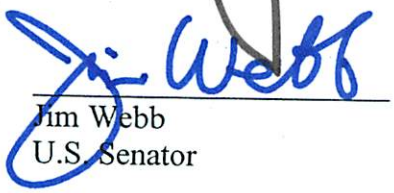
Mike Crapo
U.S. Senator



Daniel Inouye
U.S. Senator

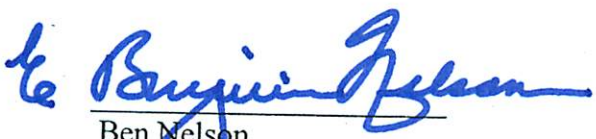


Tom Coburn
U.S. Senator



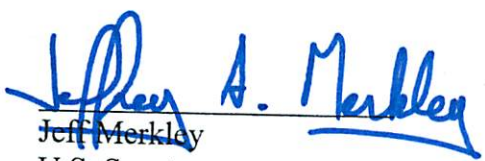
Jim Webb
U.S. Senator

Jeff Sessions
U.S. Senator



Ben Nelson
U.S. Senator

James Inhofe
U.S. Senator



Jeff Merkley
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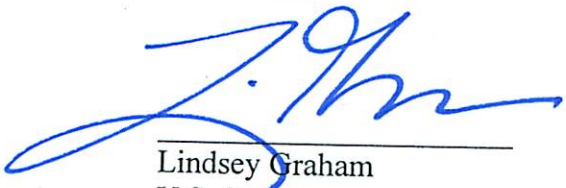
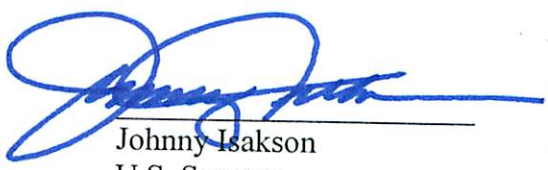
Thad Cochran
U.S. Senator

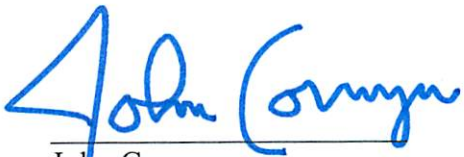


Lindsey Graham
U.S. Senator



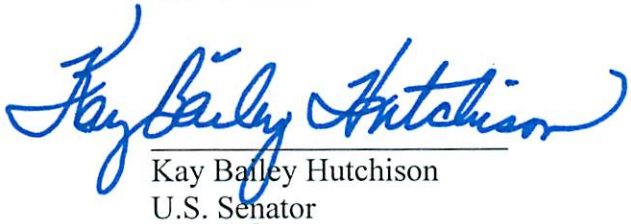
Johnny Isakson
U.S. Senator

Herb Kohl
U.S. Senator

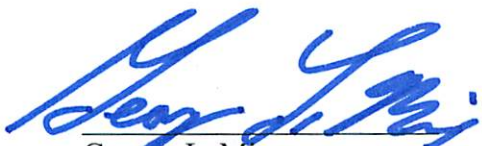


John Cornyn
U.S. Senator

David Vitter
U.S. Senator

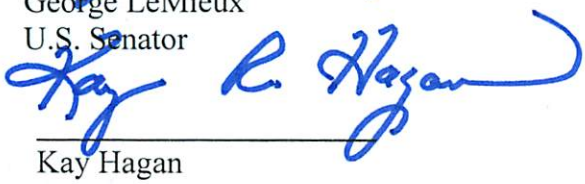


Kay Bailey Hutchison
U.S. Senator



George LeMieux
U.S. Senator

Scott Brown
U.S. Senator



Kay Hagan
U.S. Senator

cc: Regina McCarthy, Environmental Protection Agency
Robert Perciasepe, Environmental Protection Agency
Cass Sunstein, Office of Management and Budget
Thomas Vilsack, Department of Agriculture
Gary Locke, Department of Commerce
Lawrence Summers, National Economic Council
Jeffery Zients, Acting Director, Office of Management and Budget
Ron Bloom, Department of the Treasury
Nicole Lamb-Hale, Department of Commerce
Melody Barnes, Domestic Policy Council
James Messina, Executive Office of the President
Philip Schiliro, Executive Office of the President
Cecilia Munoz, Executive Office of the President

NATIONAL ASSOCIATION FOR THE ADVANCEMENT OF COLORED PEOPLE
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President & Chief Executive Officer

ROSLYN M. BROCK
Chairman, Board of Directors

July 9, 2010

Mr. Tony Hayward
Group Chief Executive
British Petroleum
International Headquarters
1 St. James's Square
London, SW1Y 4PD
United Kingdom

Dear Mr. Hayward:

On behalf of the NAACP, our nation's oldest and largest grassroots-based civil and human rights organization with an active presence in over 1,200 membership units, particularly those in Alabama, Florida, Louisiana, Mississippi and Texas, representing thousands of persons who have been affected by this oil drilling disaster, I urgently request a meeting with you to ensure all communities, including communities of color along the Gulf Coast, are fully restored and receive needed support and assistance from BP.

For the past several weeks, NAACP national staff members have been on the ground in the affected states. Recently, I personally visited, and among other activities, participated in a fly-over to view the oil spill disaster and the impact on the shorelines of Mississippi and Louisiana. Moreover, I met with members of the African American, Vietnamese and Native American communities – including residents, business owners, elected officials, community based organizations, faith leaders, and others. I witnessed their anger, fear, hopelessness and frustration.

I emerged from that visit dismayed and outraged by what I heard and saw:

- A gentleman named Darien gave testimony at a community meeting with tears in his eyes as he clutched the lease he signed in December for the shop he is on the verge of losing, because he can't afford the tripled prices for crabs.
- Chief Dardar of the Houma Nation spoke of the defilement of the land which defines the culture of the Houma nation.

- Byron, an African American fisherman in Plaquemines Parish, Louisiana, showed one of my staff members his docked boats and described his loss of livelihood which supports his family.
- Organizations representing Vietnamese fishermen who have been fishing the waters off the coast of Mississippi describe language access issues and how these barriers have made Vietnamese families vulnerable to predatory scams and also impeded their access to the claims process.

Throughout my visit, the following key issues emerged:

- ❖ Workers of color tend to be assigned the most physically difficult, lowest paying jobs, with the most significant exposure to toxins, while white workers tend to be in supervisory, less strenuous positions.

- ❖ Contractors of color are not receiving equal consideration for opportunities to participate in mitigation efforts.

- ❖ Local residents who have lost their livelihoods due to the oil spill are not being hired on to work crews. Instead, contractors engaged by BP to staff clean-up crews are busing in workers from out of state.

- ❖ Workers and residents who live on the coast have reported irritated eyes, nausea, problems breathing, and headaches.

- ❖ Cleanup workers are not being provided with protective clothing and masks, resulting in hospitalizations.

- ❖ People who are compelled to apply for cleanup work in order to feed their families -- due to inadequacies of the claim process -- are forced to sign documents that prohibit discussion of working conditions and forfeit legal redress for lost livelihoods.

- ❖ Community leaders are being denied access to information on the oil spill, particularly with respect to projections and plans are for mitigation.

- ❖ Community organizations offering a range of support services to families suffering from this disaster are financially strapped -- impeding their ability fully to address the magnitude of the problem.

We understand and appreciate that BP has been engaged in numerous efforts to address the oil spill and its impact on communities – including the concerns shared with me. But we urge BP to take further steps, including the following actions:

1. Establish monitoring mechanisms and take remedial action to ensure that workers of color are not relegated to arduous tasks and low-paid positions.

2. Guarantee that communities of color are awarded their fair share of mitigation contracts.

3. Provide financial support to community based organizations that are assisting distressed families.

I trust we will be able to meet in the very near future to discuss these and other recommendations, as well as to discuss how we can work together to make whole the families and communities that have been devastated by this tragedy.

I am looking forward to your reply.

Sincerely,

Benjamin Todd Jealous
President and CEO
NAACP

The Sea Coast Echo

Saturday | Your LOCAL news source since 1892 | May 1, 2010

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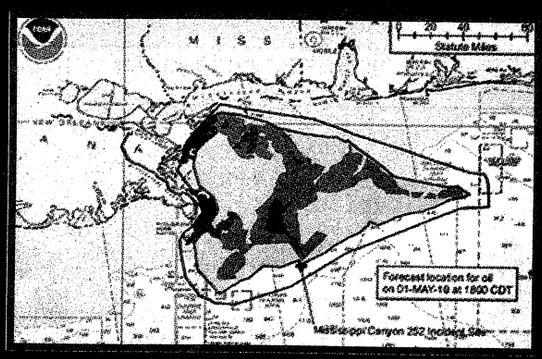
'Worse than Katrina'



A NOAA illustration showing the spill's progress.

Gulf Coast braces for oil disaster

BY J.R. WELSH
Staff Writer

Thousands of gallons of crude oil that have been gushing into the Gulf of Mexico for a week were surging toward Mississippi waters late Friday, as Hancock County and surrounding areas prepared for the worst local disaster since Hurricane Katrina.

The difference is that the dreaded hurricane came and went in a matter of hours. But once it arrives, pollution caused by the Deepwater Horizon oil rig that sunk on April 22 could be around a long, long time.

"We are in the cross-hairs of a catastrophe once again," said Rocky Pullman, president of the Hancock County Board of Supervisors. "It's not a hurricane, but rather an environmental disaster."

The oil is expected to arrive in the form of a heavy sheen, stringy tar balls, and asphalt-type substances. Underwater tar may precede the heavier flow, officials said.

Echo staff photo by J.R. Welsh

Workers from U.S. Environmental placed oil booms along the train bridge in Bay St. Louis Friday morning. The Bay of St. Louis, Bayou Caddy, and the Pass Harbor are expected to be protected by the booms. Below: EPA Administrator Lisa Jackson speaks to about 300 members of the seafood industry Friday afternoon in Waveland. Related story on page 3A.

Crews were placing containment booms in the waters of the Bay of St. Louis and Bayou Caddy Friday. The oil is expected to arrive here by Sunday afternoon, propelled by choppy seas and stiff southeast winds.

By late Friday, NOAA maps showed the northern tip of the oil mass approaching Cat Island.

At risk are wildlife, fragile marshes and islands, the fishing, shrimp and oyster industries, as well as tourism, recreational fishing, and miles

See DISASTER Page 7A

Disaster

■ Continued from Pg. 1A

of white beaches that draw visitors from around the country.

Meanwhile, the leaking BP PLC well located 50 miles off Louisiana continues to release 210,000 gallons of crude oil daily. Efforts to shut off the well or find other ways to stop the flow continue. But a solution could be weeks, if not months, away.

"I have not been sugar-coating this," said Coast Guard Rear Adm. Mary Landry, on-site incident coordinator in the BP case. "We are in a very serious situation. We haven't had a well spill like this" in U.S. history, she added.

BP officials originally said the well was leaking 1,000 barrels of oil per day. But that changed Thursday, when it became known that the flow rate was far greater.

"The estimate of 1,000 was probably low," Doug Suttles, BP Group Chief Executive, admitted at a press conference. "It's probably more like 5,000."

Oil booms are being strung all along the Mississippi Coast by U.S. Environmental, a company hired by BP. The oil company has also hired Tri-State Bird Rescue, a non-profit group, to help save sea birds endangered by the oil.

Oil was moving Friday through Chandeleur Sound, where thousands of birds nest in the spring months.

Containment booms placed across the mouth of the Bay of St. Louis appeared futile only hours after being strung. Some were tangled around pilings of the CSX Railroad bridge, and high waves were causing water to sweep completely over the barriers.

Brian Adam, director of emergency management for Hancock County, said requests would likely be made for more booms to be placed at the mouths of rivers, canals and bayous inside the bay, in calmer waters. Booms are also being placed across inlets to the west of Bayou Caddy, all the way to Pearl River, he said.

In Pass Christian, officials said they were requesting that booms be placed across the entrance to Pass Harbor.

Officials are also keeping a nervous eye on the weather. Thunder and lighting storms were expected through today, followed by rains on into Monday. That leaves a threat of high water in low-lying areas.

Should oil-polluted waters cross low-lying roads, the oil will remain when the water recedes, said Hancock County road superintendent Bill Johnson. "That will leave us with slick, dangerous roads," he said.

There were no predictions by federal or state officials of ground water contamination in Hancock County, but local officials were not discounting the possibility. "They won't say anything about it, but we know our area," Adam said.

On Friday, the county, Waveland, and Bay St. Louis passed declarations of emergency.

Also Friday, the chief executive of BP in London said his company will compensate anyone adversely affected by the Deepwater Horizon disaster. "We are taking full responsibility for the spill and we will clean it up," Tony Hayward said in an interview with Reuters. If legitimate damage claims are presented, he added, "we will honor them."

Congressman Gene Taylor issued a call Friday for the Navy to take control of the spill remediation. "Federal authorities have given BP two weeks to handle the situation," Taylor wrote to Secretary of Defense Robert Gates. So far, Taylor said, that has not worked.

At one point during the week, the Coast Guard gave permission for BP to set fire to an area of spill contained by booms. After one burn, that tactic was abandoned because of winds and high water.

"It's going to take a little time" to judge the effectiveness of burning off the oil, said Charlie Henry, a NOAA official.

Staff writer Dwayne Bremer contributed to this story

Deepwater Horizon: Impact on Hancock County

Anticipated arrival of oil pollution in Hancock waters: Sunday afternoon, possibly earlier. Forms expected: Heavy sheen, stringy tar balls, asphalt-type substances.

Present dangers: Possible high water in low-lying areas. Dangerous driving conditions, if oil covers roadways. Expect sporadic road closures.

Groundwater contamination not presently predicted.

Weather: Severe thunderstorms today, with continued heavy rainfall possible Sunday and Monday. Choppy seas.

Local areas with containment booms placed: Bay of St. Louis, Bayou Caddy, inlets west to the Pearl River.

The Big Picture

- 5,000 barrels of oil - 210,000 gallons per day - still leaking from Deepwater Horizon site.
- Barrels of oily water recovered as of Friday: 20,313. Gallons of dispersement applied by aircraft: 139,459.
- Response vessels involved: 75
- Feet of barrier booms placed: 217,000
- To report oiled or injured wildlife: 800-557-1401
- To discuss spill-related damage claims: 800-440-0858

Sources: Hancock County Emergency Management Agency, U.S. Coast Guard, Deepwater Horizon Unified Command.

JOBS FOR AMERICA:
An Open Letter to the President of the United States,
the United States Congress, and the American People

Eighteen months ago, during the greatest economic crisis since the Great Depression, the business community stood united with Congress and the President behind our shared goal of rescuing the U.S. economy and putting Americans back to work. We supported programs to stabilize our financial institutions, bolster key industries, and aid the unemployed.

Working together, we succeeded in stabilizing the economy and preventing another depression. But once accomplished, the congressional leadership and the administration took their eyes off the ball. They neglected America's number one priority—creating the more than 20 million jobs we need over the next 10 years for those who lost their jobs, have left the job market, or were cut to part-time status—as well as new entrants into our workforce. Instead of continuing their partnership with the business community and embracing proven ideas for job creation, they vilified industries while embarking on an ill-advised course of government expansion, major tax increases, massive deficits, and job-destroying regulations.

This approach has failed to return our economy to a path of robust growth, which is a critical prerequisite to significant private sector job growth. In some cases, wrong policy choices are actually eliminating good job opportunities for American workers. By straying from the proven principles of American free enterprise, policymakers are needlessly prolonging the economic agony of the recession for millions of Americans and their families

Today, more than 16% of American workers are unemployed, underemployed, or have simply given up looking for a job. Consumer confidence remains low, housing prices are still depressed, the stock market has trended downward, the global recovery is sputtering, and there are growing concerns about the prospects of a double-dip recession.

Uncertainty is the enemy of growth, investment, and job creation. Through their legislative and regulatory proposals—some passed, some pending, and others simply talked about—the congressional majority and the administration have injected tremendous uncertainty into economic decision

making and business planning. This is why banks are reluctant to lend and why American corporations are sitting on well over a trillion dollars. It is why America's small businesses and entrepreneurs, the engines of innovation and job creation, are starving for capital and are either struggling to survive or unable to expand.

In the process, we are also eroding our competitive position globally, as other nations take steps to cut taxes, reduce regulations, and restrain the appetites of government. Some are making serious headway in efforts to upgrade the skills of their students and workers, while we have yet to make significant progress. For all these reasons, the known and unknown costs that come with expanding operations and adding to payrolls in the United States are simply too high.

As the President has said repeatedly, and as every economist knows, prosperity and job growth come from the private sector, not from the government. Government's role is to establish the right conditions in which the private sector can do what it does best—foster economic growth, create innovative products and services, generate wealth, and, in the process, produce expanded revenues to educate our children, care for the sick and poor, and defend our nation.

Yet who in our government today recognizes that every bill—proposed, considered, or passed—is a "jobs bill." Government can either help the private sector create jobs or it can drive jobs away. No matter how well intentioned or politically popular a proposed law or regulation appears to be, the question must always be asked, What will the impact be on jobs?

We fear that this consideration is routinely ignored in the halls of our government today. American workers and those who are struggling to keep them employed deserve better.

Fortunately, it is not too late to improve the economic environment, forestall another downturn, and revive the job-creating capacity of our nation. We call upon policymakers of all parties and philosophies to end the finger-pointing and work constructively with the job creators to reduce uncertainty, restore confidence, and restart the recovery. It's time for some different approaches to unlock frozen capital and jolt our economy back to life.

Create a Growth and Jobs Tax Policy—Some $700 billion in tax increases have already been passed to pay for health care and other

programs. Proposals in the capital markets, energy, and climate change arenas would raise hundreds of billions more. On top of all this, just six months from now, Americans will be hit with the largest tax increase in history in precisely those areas that would have the greatest negative impact on investment and jobs— individual tax rates, dividends and capital gains taxes, the death tax, and the alternative minimum tax.

We understand that the political battle lines have long been drawn over which of the 2001 and 2003 tax cuts should be extended. Yet the "facts on the ground" must take precedence. Our precariously weak economy—and especially our all-important small business sector—simply cannot sustain such massive tax hikes at this time. We therefore urge Congress and the administration to immediately support at least a temporary extension of *all* the tax relief passed in the prior decade. In one bold, swift move, this would substantially boost investor, business, and consumer confidence and would infuse our economy with fresh momentum.

Congress should also reduce the U.S. corporate tax rate, which is among the highest in the world, and address the fact that the United States is the only major economy that double taxes overseas earnings. Taking these steps would make our companies more competitive on the world stage and help spur investment and job growth here at home.

Restore Fiscal Health—Meanwhile, spending is going through the roof and deficits right along with it. On its current course, government debt will rise from nearly 41% of GDP in FY2008 to 63% in FY2010 to 90% in FY2020. By crowding out available capital for business expansion and eventually triggering increases in interest rates and inflation, rising deficits and debt add to uncertainty, inhibit growth, and smother job creation.

No one we know of has a full or easy answer to America's debt crisis. The Chamber looks forward to the report due later this year from the National Commission on Fiscal Responsibility and Reform. However, we already know that mandatory spending, especially in entitlements, is the primary culprit. And the situation will only get worse as the population ages. Instead of expanding entitlements, as the administration and Congress have been doing, we must modernize those programs without further delay.

We also know that without sustained economic growth, we can *never* restore our nation to fiscal health. A growing economy produces more government revenues, which can substantially reduce the deficit—if and only if these revenues are accompanied by serious spending restraint.

Still, our fiscal hole is so deep that we will also need to generate additional revenues. Our policy challenge is to do so in ways that do not undermine economic growth or competitiveness. For example, there are numerous oil, gas, and shale leases on our lands and off our shores that are currently inactive. Some estimates show that they could generate as much as $1.7 trillion worth of royalties over the next 10 years. Tapping these reserves would create direct federal revenues and hundreds of thousands of jobs, while indirectly swelling the tax base and spurring economic development.

Furthermore, more than 80% of national forest lands are currently closed to timber harvesting. Opening these lands would generate direct use fees as well as thousands of jobs and would add billions of dollars to the tax base. Such initiatives must be undertaken with full and, where necessary, improved environmental safeguards and sound resource management. Embarking on this path would create growth, jobs, and tax revenues while boosting our nation's energy security.

Expand Trade and Export-Driven Jobs—The President has said that millions of American jobs can be created by doubling U.S. exports in five years, and we agree. We must now have an aggressive trade expansion agenda to make it happen. If Congress really cares about creating jobs, it will pass pending free trade agreements with Colombia, Panama, and South Korea *now*. Failure to act quickly will cost Americans many new job opportunities. But that's not all. At least 380,000 *existing* jobs will be lost to our competitors in the EU and Canada, which will soon implement free trade arrangements in these markets.

We should not stop there. American leadership is needed to revive the Doha Development Round, which would expand the economy worldwide and open new markets to our exports. The President should be given fast-track trade promotion authority, and he should use it vigorously to strike additional bilateral and regional trade and investment deals that open foreign markets and boost U.S. exports and jobs.

America's intellectual property must be better protected at home and abroad, and export control rules should be immediately revised to allow our manufacturers to sell high-tech and other products to customers that can already acquire them from our competitors.

Rebuild and Expand America's Infrastructure—Millions of jobs, as well as our global competitiveness and quality of life, depend on

modernizing all forms of the American infrastructure, including surface and air transportation, ports, inland waterways, water and power generation facilities, and broadband capacity.

Much of this important work can be done with *private* investments, but governments at all levels must first remove the regulatory, legal, and financial roadblocks. If America's transportation and water infrastructure, for instance, was fully open to private investment, the $180 billion available today in private capital could generate more than 1.5 million jobs over 10 years. Greater private investment in broadband would also foster economic development and create jobs. To ensure that all Americans fully benefit from this technology, federal policies should foster private sector investment in broadband infrastructure and minimize regulatory uncertainty.

Incentives and legal surety for investment in clean coal technologies, carbon capture systems, and massive expansion of nuclear power would also create hundreds of thousands of jobs at all skill levels while helping address environmental challenges.

Congress must also quickly pass a multiyear federal surface transportation bill. According to the U.S. Department of Transportation, each $1 billion in federal highway investment accompanied by the required 20% state match supports nearly 35,000 jobs, with similar figures for public transportation capital investment.

Ease the Regulatory Burden—There must be a recognition by the administration and Congress that the regulatory burden they have imposed on the U.S. economy has reached a tipping point. Unless the cumulative impact of existing regulations, newly mandated regulations, and proposed regulations is seriously addressed, the economy will not create the jobs Americans need. We will lose even more jobs. They will simply disappear or be sent offshore.

In recent months, the House passed a climate change bill that would create nearly 1,500 new regulations and mandates and carry a price tag of well over a trillion dollars. The Senate is considering similar legislation. The Environmental Protection Agency is moving forward with 29 major economic rules and 173 major policy rules, an unprecedented level of regulatory action. The Labor Department is considering dozens of new, restrictive workplace policies while the newly appointed National Labor Relations Board is expected to make sweeping changes governing every facet of union-management relations.

The soon-to-be-finalized financial regulatory reform legislation creates over 350 regulatory rulemakings, 47 studies, and 74 reports—dwarfing anything in Sarbanes-Oxley. The massive health care bill, with its unprecedented and confusing employer mandate and hundreds of billions of dollars in business taxes, will require thousands of pages of new regulations to be followed by individuals, businesses, health care industry providers, and the states.

Uncertainty—You can find in these numbers a principal reason why businesses are so reluctant to make investments and create jobs. Each time a new regulatory proposal is even floated in Washington, investors in the potentially impacted industries close their wallets. Uncertainty forces them to do so.

These new regulatory burdens fall heavily on new and small businesses, but they hurt larger companies too. And when larger companies are hurt, the small businesses that supply them, depend on them for sales, and service their employees suffer even more.

Creating sufficient economic growth to put Americans back to work in good-paying jobs and rewarding careers is the U.S. Chamber's top priority. The citizens of our country have repeatedly said that it is their top priority as well. It is imperative that during these difficult times, business and government leaders work with each other, not against each other. The American people expect us to find common ground and get things done to grow this economy and create jobs.

The business community shares the view of most Americans that the current approaches are not working. We are offering an achievable road map to greater economic growth and more jobs, and we don't care who gets the credit. We invite leaders in government and citizens across the nation to support it.

The Chamber of Commerce of the United States

U. S. PRESIDENTIAL DELEGATION QUESTIONNAIRE

THE OPENING CEREMONY OF THE 2010 PARALYMPIC GAMES
VANCOUVER, CANADA

MARCH 11-15, 2010

Please complete this questionnaire (typed or print) and submit to PricePL@state.gov as soon as possible.

DATES OF OFFICIAL TRAVEL: March 11-15, 2010

NAME:

Name: _____
(Last, First, Middle)

Title: _____
(As you would like it to appear on the delegation list)

ADDRESSES:

Email: _____ **Cell Phone:** _____

Office Address: _____

_____

Phone: _____ **Fax:** _____

Home Address: _____

_____

Phone: _____ **Fax:** _____

PASSPORT INFORMATION:

Passport Number: _____ **Date of Issue:** _____

Place of Issue: _____ **Expiration Date:** _____

Type: _____
(Personal, Diplomatic, Official)

PERSONAL INFORMATION:

Date of Birth: _____ Place of Birth: _____

Citizenship: _____

MEDICAL INFORMATION:

Present of past medical conditions: _____

Medications / Allergies: _____

DIETARY RESTRICTIONS:

Food: _____ Beverages: _____

Other: _____

EMERGENCY CONTACT:

Name: _____ Relationship: _____

Phone: _____ Fax: _____

Alt. Phone: _____

PERSONAL PHOTO:

Please email a digital photo of yourself in JPEG format to Pricepl@state.gov See instructions below.

***** This photo will be used for credentialing, security and accreditation purposes.**

Per Olympic Committee:

- Take a new photo - do not scan existing visa or passport photos
- Name your digital file according to the BOCOG rules of LASTNAME_FIRSTNAME_PPT#.JPG (Sample: BASHNAN_WENDY_900520222.JPG.jpg) and the size of the file must be larger than 50 kb and smaller than 500 kb
- Photo must be centered from your sternum up (i.e. part of your shoulders is needed); equal space above your head and on both sides of your head
- Look straight on to the camera - absolutely no glamor shots of tilted heads - both ears if you have them must be visible in the picture
- If you have long hair, you are required to push it back behind your ears - if you have ears
- If you are folically challenged, ensure that you don't have excessive glare on the top of your head
- If you wear glasses, I recommend you remove them before taking your photo
- White background is required
- You must ensure there are no shadows, marks, cracks or seams in the background of your headshot

BIOGRAPHY:

Please email a recent copy of your biography to Pricepl@state.gov.

DRESS REQUIREMENTS FOR THE TRIP:

At a minimum please bring the following options:

- **Business Attire for Official receptions, dinners, etc**
- **Business Casual (Warm) for Paralympic Events**
- **Casual Attire (Warm) for the Aircraft and informal events**

PRINCIPAL TRAVEL CONTACT:

Ms. Penny Price
Protocol Officer (Delegation Coordinator)
U.S. Department of State
2201 C Street, NW – Room 1238 HST
Washington, DC 20520
202-647-4005 – Office
202-997-4914 – Mobile
301-567-9686 - Home
Pricepl@state.gov – Email

CANADA

Canada is an industrialized nation in the top 25% of the world's economies. It is located in the northern half of North America. Its climate varies greatly in the many diversified regions, ranging from frigid to mild, but generally may be described as temperate with long, cold winters.

A high level of medical care comparable to that in other industrialized countries is available throughout the country.

IMMUNIZATION RECOMMENDATIONS

- **Hepatitis B**—*Recommended for:* all health care workers; the possibility of a new sexual partner during stay; prolonged stays in aboriginal or native communities. Increased awareness is recommended regarding safe sex and body fluid/blood precautions.
- **Rabies**—Risk occurs in most parts of the country with highest rates of terrestrial rabies in southern Ontario. *Recommended for:* occupational exposure only. Dog, fox, skunk, and bat bites or scratches while in this country carry a potential risk of rabies and evaluation for post-exposure prophylaxis should be sought. Prolonged exposure to bats or staying in a building in which bats are later found in any part of the country, should be taken seriously and post-exposure prophylaxis considered even in those already immunized.
- **Meningococcal meningitis**—Conjugated C vaccine (not available in the U.S.). *Recommended on arrival if not previously given for:* children 2 months to 10 years of age usually according to local dosing regimens, even if they have received MCV4 (Menactra) previously. Children 11-18 years and university students who will be living in dormitories or residence halls should receive MCV4 if not given previously. Conjugated C vaccine does not replace the need for quadrivalent (A, C, Y, W-135) vaccine in the event of subsequent travel to Africa or to the Hajj in Saudi Arabia.
- **Seasonal influenza**—Flu is transmitted November to April and all travelers are at increased risk. *Recommended for:* all travelers.
- **2009 H1N1 flu**—*Recommended for:* all travelers. Consider a standby treatment course of oseltamivir or zanamivir for unvaccinated travelers, especially those who are at high risk for complications from influenza.
- **Routine vaccinations** (adults only)
    - *Tetanus/diphtheria*. Adequate primary series plus 1 dose of Td (or Tdap) within the last 10 years. Adults who have not received at least 1 previous dose of any acellular pertussis-containing vaccine should receive Tdap vaccine at least once, in place of a Td booster.
    - *Measles*. Due to diminishing vaccine coverage in this country and/or recurring regional outbreaks, immunity is particularly important for travel to this destination. Vaccine is indicated for those born in 1957 or later (1970 or later in Canada) without history of disease or of 2 adequate doses of live vaccine at any time during their life. Many countries (including the U.K.) recommend that adults need to have had only 1 countable dose at any time during their life.
    - *Pneumococcal*. All adults over 65 and those with chronic disease or compromising conditions.
    - *Polio*. Adult polio boosters are unnecessary for travel to this country.
    - *Varicella*. Indicated for all persons born outside the U.S. or born in the U.S. after 1979, except not indicated for persons with an adequate vaccination history (2 lifetime doses), reliable evidence of previous infection, or laboratory confirmation of immunity.

MALARIA

- No malaria present.

TRAVELER'S DIARRHEA

- Minimal risk throughout the country.

OTHER

- **Lyme** disease occurs throughout southern regions of the country with highest incidence along the north shore of Lake Erie, Lake Ontario, and the southern coast and islands of British Columbia. Tick precautions are recommended.
- **West Nile** virus, transmitted by mosquitoes, occurs in birds across most of southern Canada from April to October. Human cases were reported in 5 provinces in 2009: Alberta, British Columbia, Manitoba, Ontario, and Saskatchewan. The disease presents minimal risk to travelers, except those with significant outdoor exposure in the most affected areas. The elderly and those with compromised immune systems are more at risk of serious disease if infected with the virus. Evening and nighttime insect precautions are recommended during warm months in the most affected areas.
- **Hantavirus** causing hantavirus pulmonary syndrome is transmitted by rodents and occurs in the southwestern provinces of British Columbia, Saskatchewan, Manitoba, and especially Alberta. Risk is minimal for most travelers. Avoid contact with mice and rats (including their excreta) in rural areas.
- **Wild animals** such as elk and bear can be unpredictable and are commonly encountered in National Parks and other wild areas. Consult local information centers for advice before engaging in outdoor activities.
- **Security** – The FAA (U.S.) has determined that the civil aviation authority of this country oversees its air carriers in accordance with minimum international safety standards.

INTERNATIONAL UNION, UNITED AUTOMOBILE, AEROSPACE & AGRICULTURAL IMPLEMENT WORKERS OF AMERICA – UAW

RON GETTELFINGER, President ELIZABETH BUNN, Secretary-Treasurer

VICE PRESIDENTS: GENERAL HOLIEFIELD • BOB K NG • CAL RAPSON • JIMMY SETTLES • TERRY THURMAN

IN REPLY REFER TO

1757 N STREET, N.W.
WASHINGTON, D.C. 20036
TELEPHONE: (202) 828-8500
FAX (202) 293-3457

March 15, 2010

Dear Representative/Senator:

A number of disapproval resolutions have been introduced in the House and Senate to overturn the EPA's endangerment finding on greenhouse gas emissions. It is also possible that riders could be offered to upcoming appropriations bills in an effort to accomplish the same result. The UAW opposes these misguided efforts and urges you to vote against any such disapproval resolutions or riders.

In our judgment, Congress should move forward to enact comprehensive climate change legislation that will reduce greenhouse gas emissions. Although we recognize the difficulties involved in this effort, we believe that legislation can be crafted that will reduce global warming pollution while at the same time creating jobs and providing a boost to our economy. In particular, we believe such legislation can help to provide significant investment in domestic production of advanced technology vehicles and their key components, as well as other energy saving technologies. But such progress will be undermined if a disapproval resolution or rider were to overturn EPA's endangerment finding.

The UAW understands the concerns that have been expressed about EPA attempting to use is authority under the Clean Air Act to regulate greenhouse gas emissions from various industries. However, we believe the best way to address these concerns is for Congress to move forward with comprehensive climate change legislation that properly balances concerns of various regions and sectors, and establishes a new coherent national program to combat climate change.

The UAW also is deeply concerned that overturning EPA's endangerment finding would unravel the historic agreement on one national standard for fuel economy and greenhouse gas emissions for light duty vehicles that was negotiated by the Obama administration last year. As a result of this agreement among all stakeholders, NHTSA and EPA are proceeding with a joint rulemaking effort that will result in significant reductions in fuel consumption and greenhouse gas emissions by 2016. At the same time, these proposed rules will retain the structural components that Congress enacted in the 2007 energy legislation, thereby providing important flexibility to full line manufacturers and a backstop for the domestic car fleet. Most importantly, California and other states have agreed

to forgo state-level regulation of tailpipe emissions and abide by the new national standard that will be created by these NHTSA and EPA rules. This will avoid the burdens that would have been placed on automakers if they had been forced to comply with a multitude of federal and state standards.

However, the critically important progress that was achieved with this historic agreement will be undermined if EPA's endangerment finding is overturned. Without this finding, EPA will not be able to proceed with its current rulemaking on light duty vehicles. If the joint rulemaking process collapses, NHTSA has indicated that it will not be able to meet the statutory timetable for implementing any fuel economy increases for the 2012 model year. And in the absence of the EPA standard, California and other states would certainly move forward with their standards, thereby subjecting auto manufacturers to all of the burdens that the one national standard was designed to avoid.

For all of these reasons, the UAW opposes any attempt to overturn EPA's endangerment finding, either through a disapproval resolution or through a rider. Thank you for considering our views on this important issue.

Sincerely,

Alan Reuther
Legislative Director

AR:lb
opeiu494
L8667

United States Senate
WASHINGTON, DC 20510

December 3, 2009

The Honorable Barack Obama
The President of the United States
The White House
Washington, DC 20500

Dear Mr. President:

As you prepare for negotiations in Copenhagen to address the daunting challenges of global climate change, we want to call to your attention principles we believe would be constructive in advancing an international agreement to reduce dangerous greenhouse gas emissions.

Climate change is a serious and growing threat to the United States and the world. The consequences of climate change are already being felt at home and will intensify in the years ahead in ways that place the U.S. economy and future generations at risk. Internationally, the adverse impacts of climate change will threaten vital U.S. national security, economic, energy security and humanitarian interests. Smart climate change policies would guard against these risks while also spurring clean energy investments that promote economic growth and create good domestic jobs.

Importantly, however, poorly designed climate policies could also jeopardize U.S. national interests by imposing burdens on U.S. consumers, companies and workers without solving the climate challenge. The United States cannot stop climate change alone—success depends on marshaling an effective global response. Engaging developing nations will be especially important as they represent half of global emissions today and are expected to account for nearly all of the growth in future emissions.

To protect against the twin risks of climate change and costly but ineffective climate action, the following principles regarding international cooperation should direct U.S. climate policy. To ensure the United States fully engages with the international community, these principles should be embodied in new international agreements and in domestic legislation. We stand ready to work with you to develop timely, affordable and effective climate solutions that are consistent with these principles, including a carefully-designed mandatory program that would reduce U.S. emissions, spur international action and help ensure a level playing field for U.S. companies and workers.

1. **The United States should seek global agreement on emissions reduction goals.** The consensus scientific view is that global average temperature increases ought not to exceed 3.6 degrees Fahrenheit (2 degrees Celsius) above pre-industrial levels in order to avoid unacceptable climate risks. Achieving this goal will require reducing global emissions by 50% by 2050, with industrialized nations reducing emissions 80% or more and developing nations taking increasingly ambitious actions to limit and then reduce their emissions in the same time frame.

2. **The United States should negotiate international climate agreements that promote cost effective action and improve U.S. energy security.** These agreements, including under the U.N. Framework Convention on Climate Change, should spur nations to take actions that reflect the need for a collective global response, differing stages of national economic development and varying capacities for action. To support multilateral approaches the United States should also continue to promote bilateral and regional cooperation to advance solutions and common interests.

3. **All major economies should adopt ambitious, quantifiable, measurable, reportable and verifiable national actions.** In connection with new international climate agreements, nations should develop and implement detailed, ambitious, quantifiable, measurable, reportable, verifiable and nationally appropriate climate programs that contain concrete actions that are consistent with both medium- and long-term emission reduction goals. These programs are essential for the United States and other nations to evaluate the adequacy, comparability and equity of proposed policies and actions.

4. **Reciprocal commitments are essential.** The United States should make binding international commitments to implement actions that would be embodied in new domestic climate change laws, as well as in existing laws and policies, provided that in new international agreements other major economies also make binding international commitments to undertake ambitious, quantifiable, measureable, reportable and verifiable actions. While working towards an international agreement the United States should continue to implement existing actions and move forward with ambitious and comprehensive climate legislation.

5. **Verification is essential**. Accurate, transparent, and timely information is necessary to verify whether nations are meeting their climate commitments. A new global climate agreement, therefore, should give priority to the measurement, reporting and verification of actions, particularly by major economies. The agreement should include provisions to enable a clear determination of whether countries are complying with their international commitments. Additionally, a new climate agreement should be supported by appropriate consequences for those countries not meeting their international commitments, consistent with national sovereignty. As new climate agreements enter into force, major economies should demonstrate that they have made substantial progress toward putting in place

domestically enforceable laws and programs to successfully implement their internationally agreed upon actions.

6. **The trade implications of climate policy must be addressed.** Climate and trade policies should be designed to encourage all major emitting nations to take climate action and to deter the migration of polluting activities from one nation to another. Internationally, the United States' preferred and primary strategy for dealing with trade concerns relating to U.S. climate policy should be to negotiate effective bilateral and multilateral agreements on reducing emissions in specific trade- and energy-intensive economic sectors. Collectively, these new agreements—whether negotiated under the United Nations, World Trade Organization or elsewhere—should not only ensure emission goals are reached but they should also integrate climate objectives into the international trade system, such as through border adjustments on imports from nations that have not yet adopted sufficient emission control measures. Since these agreements will be complex and may take time to negotiate, the United States should begin publicly engaging other countries now in substantive discussions on trade and climate policy. Until such agreements come into force, the United States must preserve and be willing to exercise its right to take actions that are consistent with World Trade Organization obligations. Indeed, to promote equitable and effective global action any new U.S. climate change laws should establish a national system of border adjustments, in concert with emission allowances or rebates to trade- and energy-intensive sectors of the economy. Any border adjustment policies should take effect by a date certain if appropriate international agreements have not entered into force.

7. **Enhanced technology cooperation will benefit the United States, but must be coupled with strong protections for intellectual property rights.** Meeting the climate challenge will depend on the development and dissemination of new clean energy technologies. The United States is a global leader in technological innovation and has much to gain from new initiatives to promote U.S. clean energy exports. The United States would also benefit from international collaboration to develop the revolutionary clean energy technologies needed to strengthen U.S. energy security and promote economic growth. Respect for intellectual property rights, however, is absolutely essential to spurring innovation and economic growth. New international agreements that deal with technology, therefore, must be designed to strengthen rather than weaken international implementation of intellectual property safeguards.

8. **The United States and other nations should help the most vulnerable populations adapt to the adverse impacts of climate change.** Climate change is a threat multiplier that exacerbates the risks and consequences of instability around the world. America can advance its national security and humanitarian interests by ensuring that climate laws and programs help people in the poorest countries adapt and reduce their climate vulnerability. To ensure U.S. resources are used wisely, the United States should focus such programs on least developed nations as they are the most vulnerable and have the least capacity to respond.

These assistance programs should ramp up now and not be conditioned on a new global climate agreement.

9. **The United States and other nations should create targeted incentives to help developing nations take ambitious action.** Developing nations should mitigate their emissions, and the United States has a role to play in enabling ambitious action. Climate legislation should include substantial financial incentives to promote U.S. clean energy exports and reduce tropical deforestation, including through public funding and innovative mechanisms designed to help mobilize private sector investments. These programs should be targeted toward nations that have the greatest emissions mitigation potential, are parties to ambitious new climate agreements with the United States and are acting in conformity with their obligations. The United States should be actively assisting developing nations that are preparing to take ambitious, quantifiable, measurable, reportable and verifiable actions, even before new international agreements are finalized.

10. **U.S. climate policy should promote cost-effective global action.** The cost of reducing emissions in many developing nations is lower than in the United States. For this reason creating incentives for U.S. companies to reduce international emissions will help lower costs for U.S. consumers and save American jobs. But safeguards are needed to ensure that international emission reductions financed from the United States are genuine, additional to business-as-usual and advance U.S. goals relating to climate change policy. In the case of major developing nations, one way forward would be to limit access to U.S. incentive programs, including those intended to mobilize the private sector, to nations that are making significant emissions reductions or implementing new internationally agreed upon actions. For other nations, these incentive programs should still encourage action through smaller-scale projects and activities to promote innovation and contain initial costs.

Thank you for considering our views. To confront global climate change successfully, international action and cooperation is needed. We look forward to working with you to achieve that outcome.

Sincerely,

Arlen Specter

Carl Levin

Claire McCaskill

Kay R. Hagan

Tim Johnson

Debbie Stabenow

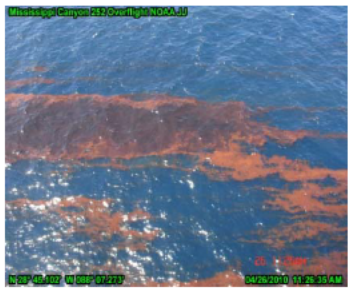
Sherrod Brown

Mark Begich

Amy Klobuchar

cc: The Honorable Hillary Clinton, Secretary, U.S. Department of State
The Honorable Harry Reid, Majority Leader, United States Senate






Deepwater Horizon Dispersant Use Meeting Report
May 26-27, 2010

Report Issued by: Coastal Response Research Center
University of New Hampshire
June 4, 2010
Revision 3

UNIVERSITY of NEW HAMPSHIRE

Coastal Response Research Center

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

FOREWORD

The Coastal Response Research Center, a partnership between the National Oceanic and Atmospheric Administration (NOAA) Office of Response and Restoration (ORR) and the University of New Hampshire (UNH), develops new approaches to spill response and restoration through research and synthesis of information. The Center's mission requires it to serve as a hub for research, development, and technology transfer to the oil spill community. The CRRC has a long history of overseeing research and development on the efficacy and effects of dispersed oil and convening dispersant related workshops with stakeholders from the oil spill community. At the request of NOAA, the center held a meeting on May 26 and 27 at the Lod Cook Alumni Center on the Louisiana State University (LSU) campus in Baton Rouge focusing on the use of dispersants in the Deepwater Horizon (DWH) incident in the Gulf of Mexico.

The meeting, titled "Deepwater Horizon Dispersant Use Meeting", was attended by over 50 scientists, engineers and spill response practitioners from numerous organizations, including: U.S. Coast Guard (USCG), Mineral Management Service (MMS), National Oceanic and Atmosphere Administration (NOAA), industry, state government, and academia. The ultimate goals of this meeting were to: (1) Provide input to the affected Regional Response Teams (RRTs) on the use of dispersants going forward in the DWH incident; and (2) Identify possible new monitoring protocols in the event of continuing aerial and subsurface dispersant application.

This report contains considerations on future use of dispersants and possible monitoring protocols for the RRTs along with the notes from the breakout groups, a participant list, the meeting agenda and Powerpoint presentations. I hope you find the input helpful and the discussion illuminating. If you have any comments, please contact me. The Center hopes that this report will be of use to the RRTs as they move forward with the Deepwater Horizon response and to the greater oil spill community and the nation.

Sincerely,

Nancy E. Kinner, Ph.D.
UNH Co-Director
Professor of Civil/Environmental Engineering

Acknowledgements

The Coastal Response Research Center gratefully acknowledges the CRRC authors of this report: Nancy E. Kinner, Joseph J. Cunningham III, Zachary E. Magdol, Heather R. Ballestero, and Tyler M. Crowe. The Center acknowledges the time and effort provided by the participants in the workshop, whose contributions have been synthesized into this report. In addition, the Center acknowledges the thoughtful input and comments received from the reviewers of the draft report: Craig Carroll (USEPA, RRT6); Richard Coffin (US-NRL); William Conner (NOAA, ORR); Charlie Henry (NOAA, ORR); Bruce Hollebone (Environment Canada); Robert Pond (USCG); Jeep Rice (NOAA, NMFS); Terry Wade (Texas A&M University). The Center also gratefully acknowledges the help of Professor Donald W. Davis (LSU – Emeritus), David Nieland (LSU, Sea Grant) and the staff of the Lod Cook Hotel and Alumni Center at LSU for their help in making this meeting happen in less than 96 hours.

The following individuals helped plan this meeting: Carl Childs (NOAA OR&R); Tom Coolbaugh (Exxon Mobil); Dave Fritz (BP); Kurt Hansen (USCG, R&D Center); Charlie Henry (NOAA ORR); Bruce Hollebone (Environment Canada); Ken Lee (Fisheries and Oceans, Canada); Joe Mullin (MMS), Bob Pond (USCG); Alan Mearns (NOAA); and Al Venosa (USEPA). The Center staff for this meeting consisted of: Heather Ballestero; Joseph Corsello; Tyler Crowe; Joseph Cunningham; Michael Curry; Eric Doe; Nancy Kinner; Zachary Magdol; and Kathy Mandsager. The Center also gratefully acknowledges Bruce Hollebone and Nichole Rutherford (NOAA OR&R) for serving as group leaders.

Citation:
Coastal Response Research Center. 2010. Deepwater Horizon Dispersant Use Meeting Report. University of New Hampshire, Durham, NH, 21 pp and appendices.

Table of Contents

I. EXECUTIVE SUMMARY

Meeting participants developed the following input to the RRTs:

Input Regarding Overall DWH Response Methods

1. Chemical dispersants, mechanical recovery and *in situ* burning are components of an effective response to surface oil pollution.

2. Mechanical recovery is the preferred method of on water oil spill response because it removes the oil from the environment, but is not always effective due to environmental conditions (e.g., weather, waves).

3. No combination of response actions can fully contain oil or mitigate impacts from a spill the size and complexity of the DWH incident.

4. Toxicity must be considered when a decision is made to apply chemical dispersants.

5. The effects of using 2.5 MG of dispersants during the Ixtoc spill in 1979 (Jernelov and Linden, 1981) should be considered as part of the evaluation of the DWH incident.

Input Regarding Dispersant Use for the DWH Incident

6. It is the consensus of this group that up to this point, 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.

7. For the DWH spill, the RRTs should provide for a continual re-evaluation of tradeoff options going forward. Because of the magnitude of the DWH spill and with the expectation of prolonged dispersant application, the RRTs should consider commissioning a Consensus Ecological Risk Assessment, or equivalent, including use of existing temporal and spatial data on the resources at risk and using the most current environmental data.

8. Dispersed oil should be tracked over time and space in combination with 3-D modeling in order to inform future decisions on the use of dispersants for the DWH incident

9. There are short term laboratory and modeling studies which can be done to aid operational decision making (e.g., effect of high oil temp, high ambient pressure, and the presence of methane on dispersion effectiveness).

Input Regarding Monitoring Protocols for Dispersant Use

10. Monitoring protocols have been used for the DWH incident, modified as needed, and should be further adapted as noted in the specific sections of this report in the event of continuing aerial and subsurface dispersant application.

II. INTRODUCTION

At approximately 2200 hours on Tuesday, April 20, 2010, the U.S. Coast Guard (USCG) received a report that the mobile offshore drilling unit (MODU) Deepwater Horizon (DWH) located in the Mississippi Canyon lease site 252 (approximately 42 miles southeast of Venice, LA), had experienced an explosion and was on fire. The MODU sunk on April 24, scattering debris from the riser pipe across the ocean floor in ~5,000 feet of water. It became clear with a few days that the blowout preventer was not functional and oil was leaking into the water from more than one location on the broken riser.

Within hours of the incident, the USCG responded and began Search and Rescue (SAR) and environmental response operations. The release is relatively close to sensitive nearshore coastal habitats and wetlands, and prevailing winds drive the surface oil towards land. To prevent landfall of the oil, mechanical recovery techniques were used, including skimming and booming, as well as *in situ* burning. However, when poor weather conditions limited the effectiveness and suitability of mechanical recovery and burning, dispersants were applied to disperse surface oil and prevent landfall. In early May, responders began injecting dispersants at the source of the release in order to prevent oil from reaching the surface. These techniques have largely been successful, and have reduced the amount of oil reaching the nearshore. Consequently, dispersant use, primarily aerial (surface) application and in the oil plume as it exits the riser (deep ocean application), has become a major response tool as the release has continued unabated. The response was declared a Spill of National Significance (SONS) on April 29, 2010, and recent reports from the National Incident Command estimate that between 12,000 and 19,000 barrels of oil are released into the water every day, making the DWH incident the largest oil spill in U.S. history. More than 990,000 gallons of dispersant have been used thus far in the response, and with completion of relief wells scheduled for August, 2010, there is potential for significant further release of oil and application of dispersants.

In the event continued dispersant use is necessary throughout the summer, the Regional Response Teams (RRTs) expressed interest in late May in convening a meeting of scientists and practitioners to discuss dispersant use and provide input to the affected RRTs. This meeting, titled "Deepwater Horizon Dispersant Use Meeting" brought together approximately 50 participants to: (1) Provide input to the affected RRTs on the use of dispersants going forward in the DWH Incident; and (2) Identify possible new monitoring protocols in the event of continuing aerial and subsurface dispersant application. Four breakout groups were established that discussed: (1) Efficacy and effectiveness of surface and deep ocean use of dispersants; (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.

III. MEETING ORGANIZATION AND STRUCTURE

The meeting, held at Louisiana State University on May 26 and 27, 2010, consisted of plenary sessions where invited speakers gave an overview of dispersant use in past oil spills, as well as an overview of the DWH incident and the response to date. Four breakout groups discussed key aspects of dispersant use in the DWH response: (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. Meeting participants were selected by a planning committee comprised of government and international partners with expertise in dispersants and oil spill response and research; meeting participants (Appendix B) represented a wide range of issue-related expertise and background, and included representatives from federal, state and foreign government agencies, as well as industry and academia.

Breakout questions (Appendix C) were developed by the Center staff and the planning committee. The breakout groups (Appendix D) developed input on continued use of dispersants for the DWH response, the risks/benefits of such use, and possible monitoring protocols going forward. In addition, they determined what information was needed to give the input, whether it was available for the DWH incident, or could be gleaned using information from past experience or the literature.

As a starting point, the following guidance was given to the breakout groups: (1) Surface dispersant operations have only been conducted in pre-approved zones (> 3miles offshore, >10 m water depth). Most dispersants have been applied 20-50 miles offshore where the water is much greater than 100 ft deep; (3) The footprint of surface dispersant application is relatively small; (4) The body of water in which the dispersants are applied is constantly changing; and (5) This meeting focused on oil effects and dispersants in general (no discussions of specific dispersants, just general composition types).

IV. MEETING RESULTS

A. Dispersant Efficacy and Effectiveness for Surface and Deep Ocean Application

Group A initially considered the efficacy and efficiency of surface and subsurface dispersant usage, however, on the second day of the workshop, the group was divided into two subgroups: Group A1 examined the efficacy and efficiency of deep ocean dispersant application, while Group A2 considered the efficacy and efficiency of surface dispersant application.

Group members included:

Group Lead: Joseph Cunningham, Coastal Response Research Center
Recorders: Joe Corsello* & Eric Doe, University of New Hampshire
Tom Coolbaugh*, Exxon Mobil
Craig Carroll#, U.S. EPA
Per Daling, SINTEF
J.T Ewing*, Texas General Land Office
Ben Fieldhouse, Environment Canada
Chantal Guenette*, Canadian Coast Guard
Ann Hayward Walker*, SEA Consulting
Lek Kadeli#, U.S. EPA
Paul Kepkay, Bedford Institute of Oceanography - Fisheries & Oceans Canada
Ed Levine*, NOAA
Zhengkai Li, Bedford Institute of Oceanography - Fisheries & Oceans Canada
Joe Mullin*, Minerals Management Service
Duane Newell*, U.S. EPA Contractor
Bob Pond, USCG
Kelly Reynolds*, ITOPF
Al Venosa, U.S. EPA

*Group Members assigned to Group A2 on Day 2
Group Members who were present for Day 1, but absent during Day 2

Information Required to Make Assessment:

- Spatial location of high, low, and non- effectiveness of dispersant
- Results of continuous water column monitoring, rather than discrete sampling events
- Extent of weathering from surface and subsurface oil
- GPS track routes to see if sampling boats are operating within the vicinity of aerial dispersant application tracks
- Properties of oil on the surface, including thickness and extent of weathering
- Properties of dispersant applied and untreated oil
- 3D visualization of plume
- Location, volume, and trends of plume
- Complete weathering profile of oil
- Accurate volumetric oil flow rate and dispersant application range
- Effect of temperature and pressure on droplet formation and dispersion

- Estimates of contact time and mixing energy
- Dispersability of emulsion after multiple applications of dispersant

Current State of Knowledge:

- Oil emulsion (> 15 – 20% water) is non-dispersible
- Plume is between 1100 – 1300 m deep moving SW direction
- DWH oil high in alkanes, and has a PAH composition similar to South Louisiana reference crude
- Lighter PAHs (< C15) are likely volatilizing
- Viscosity of emulsified oil is between 5500-8500 centistoke
- Emulsion may be destabilizing (50-60%)
- Primary detection method, C3 (fluorometer), only gives relative trends – does not accurately measure concentration of total oil or degree of dispersion

Knowledge Gaps:

- Ability of emulsions to be dispersed with multiple applications of dispersant
- Appropriate endpoint for dispersant application (i.e., how clean is clean?)
- Effectiveness and appropriateness of other dispersant applications (i.e., boat, subsurface, airplane, helicopter)
- Actual range of oil flowrates and composition (i.e., percentage oil, methane)
- Size of plume (volumetric)
- Diffusion of oil components from dispersed droplets into the water column (e.g., aliphatics, PAHs)
- Chemical composition of the plume (i.e., presence of oil, dispersant)
- Extent of surface and resurfacing of dispersed oil

Suggestions to Address Knowledge Gaps:

- Short and long term collection of chemical data (oil and dispersant concentration) at the surface and subsurface
- Measurement of methane concentrations and flowrate throughout the water column
- Analysis of natural vs chemically enhanced dispersion in the subsurface and surface

On day two, Group A was divided into two subgroups; Group A1 examined the efficacy and effects of surface water application, while A2 examined the efficacy and effects of deep ocean application.

Input for RRTs: Group A1 – Surface Application:

1. Surface application of dispersants has been demonstrated to be effective for the DWH incident and should continue to be used.
2. The use of chemical dispersants is needed to augment other response options because of a combination of factors for the DWH incident (i.e., continuous, large volume release).
3. Winds and currents may move any oil on the surface toward sensitive wetlands
4. Limitations of mechanical containment and recovery, as well as *in situ* burning.

5. Weathered DWH oil may be dispersible. Further lab and field studies are needed to assess the efficacy and efficiency and optimal dispersant application (e.g., multiple dispersant applications).
6. Spotter airplanes are essential for good slick targeting for large scale aerial applications (e.g., C-130), so their use should be continued.
7. In order to most effectively use the assets available, the appropriate vessels or aircraft should be selected based on the size and location of the slick and condition of oil. Vessels and smaller aircraft should be used to treat smaller slicks and the weathered DWH oil because they can target more accurately and repeatedly. Larger aircraft should be used for larger fresh oil slicks offshore except in the exclusion zone around the source. A matrix of oil location, oil patch slicks size and condition, dispersant technique/dosage, visual guidance, requirements for success/confirmation has been developed by the dispersant assessment group in Houma incident command. This matrix should be reviewed by the RRTs.

Risks of Input for RRTs:

Dispersants will not be 100% effective. The matrix referenced above contains information to maximize the efficacy of dispersant application on different states of the DWH oil. Dispersants redistribute the oil from the surface to the water column which is a tradeoff decision to be made by the RRT.

Benefits of Input for the RRTs:

Dispersing the oil reduces surface slicks and shoreline oiling. The use of chemical dispersants enhances the natural dispersion process (e.g., the smaller droplet size enhances potential biodegradation). Dispersing the oil also reduces the amount of waste generated from mechanical containment and recovery, as well as shoreline cleanup.

Possible Monitoring Protocols for Surface Water Application:

1. There is a good correlation between Tier 1 SMART observations and Tier 2 field fluorometry data. There has been sufficient Tier 1 and 2 data collected for the DWH incident to indicate monitoring is not required for every sortie.
2. Going forward it is important to now focus on assessing the extent of the 3D area after multiple applications of dispersant at the surface. A sampling and monitoring plan to do this has been developed by the dispersant assessment group based in the Houma command center and initial implementation has begun. The RRT 6 should review this plan.

Input to RRTs: Group A2 – Subsurface Application:

1. The subsurface dispersant dosage should be optimized to achieve a Dispersant to Oil Ratio (DOR) of 1:50. Because conditions are ideal (i.e., fresh, un-weathered oil) a lower ratio can be used, reducing the amount of dispersant required. The volume injected should be based on the minimum oil flowrate, however an accurate volumetric oil flowrate is required to ensure that the DOR is optimized.
2. If we assume a 15,000 bbls/day oil rate and a 1:50 DOR, then actual dispersant flowrate is roughly similar to the current application rate of 9 GPM.

3. To further optimize dispersant efficacy, the contact time between dispersant and oil should be maximized. Longer contact time ensures better mixing of oil and dispersant prior to being released into the water, and should result in better droplet formation.
4. Contact time can be increased by shifting the position of the application wand deeper into the riser, optimizing nozzle design on the application wand to increase fluid sheer, and increasing the temperature of the dispersant to lower viscosity.
5. Effectiveness should be validated by allowing for a short period of no dispersant application followed by a short time of dispersant usage to look for visual improvements in subsurface plume.

Risks of Input for RRTs:

Dispersants are never 100% effective. The flow rate of oil out of the damaged riser is not constant, and significant amounts of methane gas are being released. Because the effective DOR is a function of oil flow rate, changes in the oil flow rate may significantly impact the actual DOR. If the DOR is too low, dispersion may not be maximized, while if it is too high, dispersant will be unnecessarily added to the environment. Assumptions are based on knowledge at standard temperatures and pressures (STP), while conditions at the riser are significantly different. Group members suggested that the oil escaping the damaged riser may be in excess of 100°C, and it is unclear what effect this has on the dispersant, or the efficacy or effectiveness of droplet formation. These conditions may drastically alter fluid behavior. Finally, there is an opportunity cost of changes to application wand position and development and deployment of a new nozzle.

Benefits of Input for the RRTs:

When optimized, subsurface dispersant application may reduce or eliminate the need for surface dispersant application, and will reduce surfacing and resurfacing of oil. Optimized subsurface dispersant application will likely promote formation of smaller, more stable droplets of oil, theoretically allowing quicker biodegradation.

Possible Monitoring Protocols for Subsurface Application:

1. Measurement should be made on the surface and subsurface to detect dispersant and dispersed oil to gauge the effectiveness of subsurface dispersant application. Currently, no known technique exists for accurately measuring part per billion concentrations of dispersant in seawater, and novel applications of GC-MS/GC-FID or UVFS + LISST may be required.
2. Tier 1 (SMART) visual monitoring at the surface with quantification of oil with aerial remote sensing
3. Visual monitoring may be able to qualitatively demonstrate differences between dispersant application and no application (e.g., plume shape, color).

B. Physical Transport/ Chemical Behavior of Dispersed Oil

Group B was focused on the physical transport and chemical behavior of dispersed oil. While the initial goal was to look at these characteristics for chemically dispersed oil, the scope of the deepwater horizon incident required looking at both chemically and naturally dispersed oil.

Group members included:

Group Lead: Bruce Hollebone, Environment Canada
Recorder: Tyler Crowe, Coastal Response Research Center
Les Bender, Texas A&M
Mary Boatman, Minerals Management Service
Michel Boufadel, Temple University
Robert Carney, Louisiana State University
Jim Churnside, U.S. EPA
Greg Frost, U.S. EPA
Jerry Galt, Genwest
Buzz Martin, Texas General Land Office
Allan Mearns, NOAA
Scott Miles, Louisiana State University
Erin O'Riley, Minerals Management Service
Jim Staves, U.S. EPA

Information Required to Make an Assessment and Knowledge Gaps:

- Contact efficiency between dispersant and oil at the sea floor
- Release rate of oil and gas
- Dispersion efficiency at injection point on sea floor
- Mixing energy at injection point on sea floor
- Effects of increased pressure and temperature on dispersion efficiency
- Temperature of released oil
- Degree or rate of weathering of oil in rising plume (e.g., dissolution, vapor stripping)
- Emulsion formation and dispersion in the rise zone, under pressure
- Destabilization of emulsions as pressure decreases
- Biodegradation rate on droplets at pressure and at bottom temperature
- Sedimentation of dispersed oil from depth
- Biological uptake, particularly in demersal and benthic organisms
- Surface Langmuir circulation potential for mixing
- Surface advection rates versus oil discharge to determine buildup potential
- BTEX levels above oil slick
- Suppression of airborne VOCs when using dispersants
- Airborne concentrations of 2-butoxy ethanol from spring
- Atmospheric breakdown and toxicity of 2-butoxy ethanol and other products
- Improved NEBA for dispersant use

Current State of Knowledge:

- Surface models are effective and continuously improving
- SMART protocols are improving
- Increase of sampling at depth
- Well researched region (oceanographic and ecological studies)
- Well established baseline data
- Airborne application protocols are established

Suggestions to Address Knowledge Gaps:

- Review Norwegian experiments (Deep Spill, 2000)
- Review literature on IXTOC I
- Increase in remote sensing of the dispersed area (check for oil resurfacing)
- Use of smaller grid sizes or nested grids on models
- Increased offshore surface sampling independent of SMART at fixed stations in the operational zone
- Establishment of criteria for discontinuance of dispersant operations
- Further research on the contact efficiency between dispersant and oil at the subsurface injection point
- Better understanding of release rate and temperature of oil and gas
- Quantification of mixing energy at injection point
- Better coupling between offshore (ocean/pelagic) and onshore (estuarine or riverine) hydrodynamic models (LaGrangian vs. Eulerian)
- Laboratory investigation of effects of elevated pressure and temperature on dispersion efficiency at depth (e.g., study in pressure cells)

Input for RRTs:

1. Create an on-scene environmental review committee to advise SSCs that will be responsible for providing immediate operational and scientific advice, and aid in dispersant decisions. This committee should be comprised of government agencies and academia that meet regularly.
2. Clearly define geographic area/water volume of concern. This will improve estimates for scale of impact (1st order approximation). This is important for NEBA analysis, and is based on current application rates, and maximum concentrations in the water volume.
3. Establishment of a more comprehensive sampling and monitoring program to understand transport of oil on the surface and potential for long-term increases to TPH, TPAH, oxygen demand, or lowering of DO with continued dispersant application. This could be done by implementing off-shore water (first 10 m) monitoring stations (e.g., fixed stationary positions such as other drill rigs).

Risks of Input for RRTs:

Continued dispersant use trades shoreline impacts for water column impacts. This increases the uncertainty of the fate of the oil, and potentially increases the oil sedimentation rate on the bottom.

Benefits of Input for the RRTs:

Continued dispersant use reduces the threat distance, protects shorelines, likely increases the biodegradation rate of the oil, inhibits formation of emulsions, reduces waste management, and potentially reduces buildup of VOCs in the air.

Possible Monitoring Protocols for Subsurface Application:

1. Measure size and shape of the plume with and without subsurface injection of dispersant in order to have a better understanding of the efficacy. Sonar

monitoring of plume size and morphology (tilt) can be used; increases in plume size or longer "tail" of droplets suggest greater dispersion

2. Additional monitoring in the rising plume at a variety of depths to improve transport modeling and development of boundaries and constraints on estimates.
3. Additional subsurface monitoring of water temperature, particle size distribution, fluorescence monitoring of dispersant concentration, and total petroleum hydrocarbons (TPH) to define subsurface plume concentrations and boundaries.
4. Increase surface layer water quality monitoring (profile of upper 10 m) to address concerns of cumulative loading of water with oil and dispersant. Size of the monitoring zone will vary with advection and dispersant application. Should monitor for TPH, PAHs, dissolved oxygen, salinity, temperature, biological oxygen demand (BOD), VOA, and if feasible, surfactant monitoring and toxicity testing.
5. Further air monitoring of surface water quality zone to gain a better understanding of volatilization and risk to responders. Monitoring should include BTEX and VOC concentrations, and while COREXIT 9527 is being used, 2-butoxy ethanol.

C. Biological Effects of Dispersants on Deep Ocean Species

Group C discussed exposure pathways of dispersants applied to the subsurface and subsequent biological effects. Group members included:

Group Lead: Zachary Magdol, Coastal Response Research Center
Recorder: Mike Curry, Coastal Response Research Center
Adriana Bejarano, Research Planning Inc.
Richard Coffin, Naval Research Laboratory
William Conner, NOAA Office of Response and Restoration
Charlie Henry, NOAA, Scientific Support Coordinator for USCG District 8
Ken Lee, Environment Canada
Jeffrey Short, Oceana
Ron Tjeerdema, University of California

Information Required to make assessment:

- Receptor species/species at risk
- Identify species at risk including their migration, feeding habits, life histories, reproductive strategies/recruitment
- Dispersant effect on oxygen and other electron acceptor availability on key biogeochemical cycles in the deep water ecosystem
- Assess the maximum rates of dispersant application to balance treatment of the spill and a low environmental impact
- Determine the impact on nutrient recycling, general efficiency of food chain
- What is the particle size distribution as a function of depth, and if these changes affect key elemental absorption and feeding strategies
- Oil biodegradation rates, microbial community structure and ecosystem function in the presence and absence of the dispersant
- Evaluate the seasonal and spatial variation in the deep ocean oxygen demand in the presence and absence of the dispersant

- Scavenging particle interactions, oil-mineral aggregate formation at source and throughout water column
- Vertical and horizontal transport dynamics of deep water ocean currents for an overview of the oil and dispersant transport and dilution
- Unknown indirect effects (e.g., persistence) on the food chain and key elemental cycles
- Biogeochemical and habitat data about ecosystems near natural deep water petroleum seeps to evaluate the cycling rates and community structure
- Percent effectiveness of the seafloor dispersant application relative to the surface application
- Determine the changes in the petroleum layer through the water column with application of the dispersant
- Changes in microbial degradation due to selective metabolism from addition of dispersants (e.g., is there a preferred dispersant degradation that will pathway that will limit petroleum degradation?)
- Effectiveness of natural dispersion
- Knowing the downstream flux of oil residue from the spill to the seafloor to contribute to a net balance of the oil fate

Current State of Knowledge:

- Minerals Management Services, Gulf of Mexico deep water studies/reports: http://www.gomr.mms.gov/homepg/regulate/environ/deepenv.html
- Natural hydrocarbon seepage in the Gulf of Mexico approximately 40 million gallons per year
- Some knowledge and past studies on deep water species in the Gulf of Mexico
- Preliminary modeling
- Preliminary monitoring data (Fluorometry data, Particle size analysis, Temperature, Salinity, D.O., Hydrocarbon, Acute toxicity , Acoustic data, sonar, Genomics)
- None of the information listed above is considered "complete"

Knowledge Gaps:

- Preliminary models not validated
- Life history of benthic biota
- Migratory patterns and residence time of deep water species
- Microbial degradation rates on deep ocean hydrocarbon seeps
- Dispersant and dispersed oil byproducts
- Chronic toxicity of benthic biota
    - Comparison of bioaccumulation/bioavailability between different droplet sizes
    - Comparison of toxicity and environmental impact of natural vs chemically enhanced dispersed oil
- Species avoidance of oil

Suggestions to Address Knowledge Gaps:

- Formulation of biogeochemical rates with respect to fuel transport and sedimentation

- Early life stage studies, laboratory or cage studies
- Robust toxicity studies for deep water species
- Spatial and temporal variation in the ecosystem oxygen and alternate electron acceptor availability

Input for RRTs:

1. Dispersant risk assessment should consider volume of DWH incident relative to natural seepage
2. There is a net benefit to continued subsurface dispersant use and application should continue

Risks of Input for RRTs:

Dispersant use increases the extent of biological impacts to deep water pelagic and/or benthic organisms, including oxygen depletion, release of VOCs into the water column, and toxicity. This may lead to changes in the diversity, structure and function of the microbial community, leading to changes in trophic level dynamics and changes to key biogeochemical cycles.

Benefits of Input for the RRTs:

- Surface water column and beach impacts vs. vertical water column impacts
- Observed reduction in volatile organics at surface
- Enhances the interaction between oil and suspended particulate material
- Accelerated microbial degradation through increased bioavailability
- Rapid recovery of downward sulfate diffusion and upward methane diffusion related to shallow sediment geochemistry
- Based on current knowledge, subsurface dispersant use confines the aerial extent of impact
    - Current impact zone is less than 50 km radius
- Reduction in emulsified oil at the surface
- Reduction of phototoxic impacts

Possible Monitoring Protocols for Surface Water Application:

1. Robust deep ocean toxicity studies
    - Application of research done with acute toxicity on foraminifera, possibility of chronic studies (LC50, EC50)
    - Identify control areas, in terms of system ecology, physical ocean properties, and biogeochemical parameters
    - Cage studies in the plume
    - Identify surrogate/indicator species for impacts over a range of trophic levels
    - Identify key species of concern (migratory species)
    - Microbial genomics to survey changes in the community structure that changes key elemental cycles
    - Long term biological effects for resident species with baseline information
2. Biogeochemical monitoring
    - Petroleum degradation rates (C14 labels)

- Microbial production and function (3H thymidine/leucine and Genomics)
- Community diversity (16S RNA)
- Background parameters (DOC, POC, DIC, concentration and $\delta^{13}C$)
- Bioavailability of the oil as a function of particle size

3. Physical/chemical parameters
   - UV fluorometry (Including FIR)
   - Monitor the particle size distribution of the oil as function of space and time (LISST particle counters)
   - Current velocity (ADCP)
   - Chemical properties CTD (oxygen, salinity, pH, SPM)
   - Chemical and source properties of the oil as a function of space and time (GC-MS and IRMS)
   - Potential of acoustic monitoring (3.5 and 12 khz)

D. **Biological Effects of Dispersants on Surface Water Species**

Group D focused on the effects of surface dispersant application on species in the top ten meters of the water column. Group members included:

Group Lead: Nicholle Rutherford, NOAA
Recorder: Heather Ballestero, University of New Hampshire
Carys Mitchelmore, University of Maryland
Ralph Portier, Louisiana State University
Cynthia Steyer, USDA
Mace Barron, U.S. EPA
Les Burridge, St. Andrews Biological Stn, Fisheries and Oceans Canada
Simon Courtenay, Gulf Fisheries Centre, Fisheries and Oceans Canada
Bill Hawkins, Gulf Coast Research Laboratory, University of South Mississippi
Brian LeBlanc, Louisiana State University
Jeep Rice, NOAA
Doug Upton, MS DEQ
Terry Wade, Texas A&M University

Information Required to make assessment:

- Spatial location of oil, dispersants, and species
- The levels of concern need to be noted (e.g., sensitive species life stages, exposure pathways, LC50's oil and dispersant constituents)

Current State of Knowledge:

- The oil is being dispersed in the top ten meters of the water column from surface dispersant application (fluorescence methods)

Knowledge Gaps:

- Effectiveness of dispersant
- Long term effects of dispersant exposure (carcinogenicity)
- Dispersed oil effects in an estuarine/riverine/pelagic environment
- Bioavailability, bioaccumulation

Suggestions to Address Knowledge Gaps:

- Develop a clearinghouse to facilitate access to baseline data being collected

- Know dose of exposure, effects, species present and tradeoffs with habitat protection
- Understand differences between dispersed vs. non-dispersed oil

Input for RRTs: Effects of Dispersant in the top 10 M.

1. Surface application of dispersants is acceptable. Transferring the risk from the surface to the top 10 m is the lesser of the many evils.
2. Additional monitoring is required to better model where dispersed oil is going. Long term (monthly) monitoring is required at a minimum, and should be conducted in a grid formation inshore to open ocean. Passive samplers (i.e., SPME) should be used in selected areas, while a active water sampling program should be implemented to measure dispersant and dispersed oil, dissolved oxygen, and standard CTD + chlorophyll concentrations, as well as selected bioassays.

Possible Monitoring Protocols:

1. Monitor below 10 m
2. Monitor surface to bottom across a transect from the shore to source
3. Deploy semi-permeable membrane device (SPMD), passive sampling, or oysters
4. Monitor concentration and exposure time to get a better understanding of effective dose
5. Use state-of-the-art toxicity tests

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APPENDIX A

DEEPWATER HORIZON DISPERSANTS MEETING
May 26 – 27, 2010

Cook Center
Louisiana State University, Baton Rouge, LA

AGENDA

Tuesday, May 25		
	Arrival and Check-In	

Wednesday, May 26		
8:00	Continental Breakfast	
8:30	Welcome and Introductions	**Nancy E. Kinner, UNH Co-Director: Coastal Response Research Center**
		David Westerholm, Director: Office of Response & Restoration: National Oceanic and Atmospheric Administration **James Hanzalik, USCG; RRT 6** **Craig Carroll, EPA; RRT 6**
8:45	Background and Meeting Goals Workshop Structure, Logistics & Outcomes	**Nancy E. Kinner, CRRC**
9:00	Participant Introductions	
10:00	Break	
10:15	Plenary Session: Setting the Stage	
	Deepwater Horizon Spill Overview *Dispersant application for DWH spill (aerial and subsurface application)*	**Charlie Henry, NOAA SSC**
	Dispersant use in previous spill responses	**Kelly Reynolds, International Tanker Operators Pollution Fund (ITOPF)**
	Field evaluation of alternative dispersants	**Tom Coolbaugh: Exxon Mobil**
	Monitoring dispersant efficacy	**Ken Lee, Paul Kepkey, Zhangkai Li:: Bedford Institute of Oceanography**
12:15	**Lunch**	
1:00	**Commissioning of Groups** **Discussion of Common Starting Points**	**Nancy E. Kinner, CRRC** **Charlie Henry, NOAA**

DEEPWATER HORIZON DISPERSANTS MEETING

May 26 – 27, 2010

Wednesday , May 26		
1:15	Breakout Session I	
	Group A: Dispersant efficacy and effectiveness	**Leader: Joe Cunningham, CRRC**
	Group B: Physical Transport/ Chemical Behavior of dispersed oil	**Leader: Bruce Hollebone, Environment Canada**
	Group C: Biological effects of dispersants on deep ocean species	**Leader: Zachary Magdol, CRRC**
	Group D: Biological effects of dispersants on surface water species	**Leader: Nicolle Rutherford, NOAA OR&R**
3:15	Break	
4:15	Plenary Session: Group Reports	
5:15	Wrap-Up	**Nancy E. Kinner, CRRC**
5:30	**Adjourn**	

Thursday, May 27		
8:00	Continental Breakfast	
8:20	Overview and Review/Recalibrate	**Nancy Kinner**
8:30	Breakout Session II	
	Group A1: Dispersant efficacy and effectiveness: Deep Ocean Application	**Leader: Joe Cunningham, CRRC**
	Group A2: Dispersant efficacy and effectiveness: Surface Application	**Leader: Nancy E. Kinner, CRRC**
	Group B: Physical Transport/ Chemical Behavior of dispersed oil	**Leader: Bruce Hollebone, Environment Canada**
	Group C: Biological effects of dispersants on deep ocean species	**Leader: Zachary Magdol, CRRC**
	Group D: Biological effects of dispersants on surface water species	**Leader: Nicolle Rutherford, NOAA OR&R**
10:00	Break (as necessary)	
11:15	Plenary Session: Breakout Group Reports	
12:15	Lunch	
1:00	Plenary Session: Development of Input and Protocols for RRTs and Next Steps	**Nancy E. Kinner, CRRC**
4:30	**Adjourn**	

APPENDIX B

NAME		AFFILIATION
Mace	Barron	U.S. EPA
Adriana	Bejarano	Research Planning, Inc
Les	Bender	Texas A&M
Marie	Benkinney	Exponent
Mary	Boatman	U.S. Minerals Management Service
Michel	Boufadel	Temple University
Les	Burridge	St. Andrews Biological Stn, Fisheries and Oceans Canada
Robert	Carney	Louisiana State University
Craig	Carroll	EPA, RRT 6
Jim	Churnside	NOAA
Richard	Coffin	Naval Research Laboratory
William	Conner	NOAA, ORR, ERD
Tom	Coolbaugh	ExxonMobil
Simon	Courtenay	Gulf Fisheries Centre, Fisheries and Oceans Canada
Per	Daling	SINTEF
Ronald	DeLaune	Louisiana State University
Christopher	D'Elia	Dean, School of Coast and Environment, LSU
J.T.	Ewing	Texas General Land Office
Ben	Fieldhouse	Environment Canada
Greg	Frost	NOAA
Jerry	Galt	NOAA, Genwest
Judy	Gray	NOAA
Christopher	Green	Louisiana State University
Chantal	Guenette	Canadian Coast Guard
James	Hanzalik	USCG, RRT6
Bill	Hawkins	Gulf Coast Research Laboratory, USM
Ann	Hayward Walker	SEA Consulting
George	Henderson	FL Fish & Wildlife
Charlie	Henry	NOAA, ORR, SSC
Bruce	Hollebone	Environment Canada
Lek	Kadeli	U.S. Environmental Protection Agency (ORD)
Paul	Kepkay	Bedford Institute of Oceanography - Fisheries & Oceans Canada
Nancy	Kinner	Coastal Response Research Center
Brian	LeBlanc	Louisiana State University
Ken	Lee	Bedford Institute of Oceanography
Ed	Levine	NOAA, ORR, SSC
Zhengkai	Li	Bedford Institute of Oceanography - Fisheries & Oceans Canada
Buzz	Martin	Texas General Land Office
Alan	Mearns	NOAA, ERD
Scott	Miles	Louisiana State University
Carys	Mitchelmore	University of Maryland, CES
Joe	Mullin	US Minerals Management Service
Tim	Nedwed	ExxonMobil
Duane	Newell	U.S. Environmental Protection Agency
John Andrews	Nyman	Louisiana State University
Erin	O'Reilly	U.S. Minerals Management Service, New Orleans
Christopher	Piehler	LA DEQ
Bob	Pond	U.S. Coast Guard
Ralph	Portier	Louisiana State University
Kelly	Reynolds	ITOPF
Jeep	Rice	NOAA, Auk Bay NMFS lab
Nicolle	Rutherford	NOAA, ERD
Jeffrey	Short	Oceana
Gus	Stacy	LA Oil Spill Coordinators Office (LOSCO)
Jim	Staves	U.S. Environmental Protection Agency
Cynthia	Steyer	USDA NRCS
Ron	Tjeerdema	University of California
Kenneth	Trudel	SL Ross
Doug	Upton	Mississippi DEQ
Albert	Venosa	U.S. Environmental Protection Agency
Terry	Wade	Texas A&M University
Dave	Westerholm	NOAA, ORR

COASTAL RESPONSE RESEARCH CENTER STAFF:	
Joseph	Cunningham
Joe	Corsello
Heather	Ballestero
Kathy	Mandsager
Tyler	Crowe
Zachary	Magdol
Eric	Doe
Mike	Curry
Beth	Potier

APPENDIX C

Breakout Sessions

Overarching Goals:

1. **Provide specific recommendations to the Region 4 and Region 6 Regional Response Teams (RRT) on the advisability of continuing the current level of dispersant operations, including changes in dispersant use and application methods for the spill.**
2. **Identify possible monitoring protocols in the event of continuing aerial and subsurface dispersant application.**

Breakout Session I: Wednesday afternoon

1. What do we need to know in order to make recommendations regarding dispersant operations and to identify possible monitoring protocols?
2. What is the current state of knowledge regarding the DWH spill?
3. What are the gaps in our knowledge or information?
    a. Can these gaps be addressed using information from past experience and/or the literature?
    b. If not, what information should be collected in the short and long term to support these recommendations?

Breakout Session II: Thursday morning

1. Develop specific recommendations for aerial and subsurface dispersant use if the DWH release continues.
    a. What are the tradeoffs (risks/benefits) associated with these recommendations?
2. Identify possible monitoring protocols in the event of continuing dispersant use.

APPENDIX D

Breakout Groups

Group A:Efficacy and Effectiveness	Group B: Physical Transport and Chemical Behavior
Room: Abell Room	**Room: Anderson Room**
Group Lead: Joe Cunningham *Recorders: Joe Corsello + Eric Doe* Tom Coolbaugh Craig Carroll Per Daling J.T Ewing Ben Fieldhouse Chantal Guenette Ann Hayward Walker Lek Kadeli Paul Kepkay Ed Levine Zhengkai Li Joe Mullin Duane Newell Bob Pond Kelly Reynolds Al Venosa	Group Lead: Bruce Hollebone *Recorder: Tyler Crowe* Les Bender Mary Boatman Michel Boufadel Jim Churnside Robert Carney Greg Frost Jerry Galt Buzz Martin Allan Mearns Scott Miles Erin O'Reilly Jim Staves

Group C: Biological Effects: Deep Ocean	Group D: Exposure and Effects: Non-commercial
Room: Shelton Room	**Room: Cook Room**
Group Lead: Zachary Magdol *Recorder: Mike Curry* Adriana Bejarano Richard Coffin Bill Conner Charlie Henry Ken Lee Jeff Short Ron Tjeerdema	Group Lead: Nicholle Rutherford *Recorder: Heather Ballestero* Carys Mitchelmore Ralph Portier Cynthia Steyer Mace Barron Les Burridge Simon Courtenay Bill Hawkins Brian LeBlanc Jeep Rice Doug Upton Terry Wade

APPENDIX E

RECORDER NOTES – GROUP A1 – MAY 26, 2010

Breakout Session I: Wednesday afternoon

1. What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?

Way for oil to be dispersed
Effectiveness of dispersants – surface and subsea
Fluorometer use – indecisive
Where effectiveness high and low
Continued use good for right oil – remove tier 1 to get particle size – overall picture everyday
Oil is dispersible
Continuous monitoring of water column rather than discrete events
Surface vs subsurface dispersant – amount of weathering
Tier 2 – not specific data
GPS routes – see if boats are located where near planes are
Tier 1 = Eyeball aerial observation
Tier 2 = Fluorometry at 1 m below
Tier 3 = multiple depths
C3 = Fluorometer
Small aircraft, Big aircraft, sampling vessels
Better placement of tier 2 sampling vessels
Tier 1 and 3 are best – big boat tier 3
Property of oils on surface – weathering of source out to get properties and thickness of layer
Visual profile of oil
Treated and non-treated oil properties
Increasing amount of energy for dispersants – turbulence 1, 2 hrs after
Different levels of monitoring for different levels oil weathering
Fresh oil – tier 1
Tier 2 – proof of performance
Weathering profile – transitional phase - to see when dispersant is no longer needed
Emulsified oil as indicator of dispersant use
Deep water plume – know where is it
Amount of dispersant:flowrate of oil
Ratio of dispersant to oil – deep water
Droplet size – deep water
Temperature effect on dispersion
Amount of mixing energy and time – deep water
Emulsion may be dispersible with multiple applications of dispersant – needs to be researched
What is causing the small droplets at the surface?

2. What is the current state of knowledge regarding the DWH spill?

Location of plume: 1100 – 1300 ft moving SW direction
DWH oil high in alkanes, PAH similar to reference oil, up to C30
14-21% emulsified oil – may have come from skimmer
10-15% natural water and oil – surface oil (redish brown)
Less than C15 volatilizing
Max = 200,000 centistoke
Emulsified 5500-8500 centistoke
Need to know how oil is weathering on surface
Oil emulsion is non dispersible (15-20%) and when redish brown
Mousse is dispersing- not as good as before
Emulsion may be destabilizing (50-60%)
Take sample, add dispersant, shake, see if dispersed
Resurfacing – samples needed for what is resurfacing
C3 – calibration needed
C3 (fluorometer) gives relative trends – no level of total oil or degree of dispersion
(Need quick field tests)

3. What are the gaps in our knowledge or information?

Similar to #1
Can emulsions be dispersed with multiple applications?
When is the endpoint of effective dispersance? Look at data
Should other dispersant application methods be considered besides air (boat, subsurface)
Oil flowrate – max, min
Size of plume (volumetric)
Leaching rate from small droplets
Leaching rate - soluble components in oil
Rate of dispersant in subsurface application (how well will it disperse)
Is the plume of oil and dispersant rising together?

a. Can these gaps be addressed using information from past experience and/or the literature?

Lack of research on top surface

Data to collect:
Short Term – methane at surface, dispersant (if any), chemical dispersance vs. natural dispersance

b. If not, what information should be collected in the short and long term?

Measure concentrations of oil and dispersants through water column

RECORDERS NOTES – GROUP A1 – MAY 27, 2010

Breakout Session II: Thursday morning

1. Develop input for the RRTs on subsurface dispersant use if the DWH release continues.

MIXING -

-Dosage required – better understanding of required ratio (more systematic)
-Maximize contact time period between oil and dispersant from riser (shift wand position)
-Optimized mixing in riser – wand position (deeper is better – double or more), smaller nozzle on wand to increase fluid sheer (mixing on the small scale)
-Increase temperature of dispersant to lower viscosity – use oil to naturally heat dispersant? (collect data of droplet size as oil exits riser)
    -oil is at 100 degrees C
    -oil vs dispersant temperature experiments for best conditions?
-Short time of no dispersant (record data) followed by short time of dispersant usage (record data) and look for improvement to validate effectiveness

DOSAGE –

-If mixing is optimal dispersant dose may be high
-Use minimum flowrate to derive DOR
    Optimal in lab = 1:25
    Measure oil flow (estimated 15,000 barrels/day ~450gpm)
    Lower DOR is better (1:50 ~ 9gpm)
-If use the assumed 15,000 barrels/day AND 1:50 DOR, then actual dispersant flowrate stays roughly the same

a. What are the tradeoffs (risks/benefits) associated with this input?

- Dosage
    - Risks

If too low DOR, will not be getting maximized dispersion
If high DOR, adding more dispersant to environment
Are we doing enough dispersion?

    - Benefits

Cut down need to add surface dispersants
Protect shoreline
Create smaller droplets that may degrade faster
Avoid surfacing

- Mixing
    - Risks

      Lab results are based on STP and actual conditions differ (5,000ft and 100 C)
      Opportunity cost of having to make a new “nozzle” and deployment

    - Benefits

      More stable
      Kept below surface
      Lower droplet size
      More efficient delivery of dispersant

2. Identify possible monitoring protocols in the event of continuing dispersant use.

   Monitor for:
   Dispersant present on surface from subsurface injection
   Dispersant in water column
   Surface and depth for chemically dispersed vs. physically dispersed oil
      Potentially measured using GCMS/GCFID
      UVFS and LISST
   Tier 1 visual monitoring at surface with quantification of oil with aerial remote sensing
      Collect images

   Technique for surface and depth detection of dispersant
   No reference control monitoring of dispersion at depth
   Visual monitoring may demonstrate differences between dispersant application and no application – plume shape, color

RECORDER NOTES – GROUP A2 – MAY 27, 2010

Overall input:

1. **Surface application of dispersants has been demonstrated to be effective for the DWH incident and should continue to be used.**
2. **The use of chemical dispersants is needed to augment other response options because of a combination of factors for the DWH incident: 1) continuous, large volume release, 2) Relative proximity to sensitive wetlands, 3) winds and currents which may move the oil toward sensitive wetlands, and 4) Limitations of mechanical containment and recovery and in-situ burning.**
3. **Weathered DWH oil may be dispersible. Further lab and field studies are needed to assess the efficacy and effectiveness and optimal dispersant application (e.g., multiple dispersant applications).**
4. **Spotter airplanes are essential for good slick targeting for large scale aerial application (e.g., C130), so their use should be continued.**
5. **In order to most effectively use the assets available, the appropriate vessels or aircraft should be selected based on the size and location of the slick and condition of the oil. Vessels and smaller aircraft should be used to treat smaller slicks and the weathered DWH oil because they can target more accurately and repeatedly. Larger aircraft should be used for larger fresh oil slicks offshore except in the exclusion zone around the source. A matrix of oil location, oil patch slicks size and condition, dispersant technique/dosage, visual guidance, requirements for success/confirmation has been developed by the dispersant assessment group in Houma incident command. This matrix should be reviewed by the RRT.**

What are the tradeoffs (risks/benefits) associated with this input?

Risks: Dispersants will not be 100% effective. The matrix citied in #5 of overall input section above contains information to maximize the efficacy of dispersant

application on different states of the DWH oil. Dispersants redistribute the oil from the surface to the water column which is a tradeoff decision to be made by the RRT.

Benefits: Dispersing the oil reduces surface slicks and shoreline oiling. The use of chemical dispersants enhances the natural dispersion process (e.g., smaller droplet size enhances biodegradation). Dispersing the oil also reduces the amount of waste generated from mechanical containment and recovery and shoreline cleanup.

Relevant literature and field study information:

1. **Field data (tier 1 and tier 2) at the DWH site demonstrate that under calm seas aerial application of the dispersant is effective.**
2. **OHMSETT testing in calm seas and non-breaking waves on fresh oil demonstrated that dispersant will stay with oil and if energy subsequently increases, the oil will disperse. If it remains calm over a period of days, a fraction of the dispersant may leave the oil and dissolve in the water column (this is a function of underlying currents).**

Caveats:

1. **There are logistical difficulties in getting tier 2/3 (fluorometry) data for aerial application because of the 2 mile safety restriction on any vessel after the plane has sprayed. It may be 20-30 mins before the boat starts moving towards the perceived area of application. This may mean that the sampling vessels do not collect data where the dispersant was applied. This operational issue should be addressed.**
2. **The RRTs should develop criteria for discontinuing or altering dispersant operations.**

Question 2: Identify possible monitoring protocols in the event of continuing dispersant use.

Protocols:

1. **There is good correlation between tier 1 observations and tier 2 field fluorometry data. There has been sufficient tier 1 and 2 data collected for the DWH incident to indicate monitoring is not required for every sortie.**
2. **Going forward it is important to now focus on assessing the extent of the cumulative extent of the 3D area after multiple applications of dispersant on the surface. A sampling and monitoring plan to do this has been developed by the dispersant assessment group based in the Houma command center and initial implementation has begun. The RRT6 should review this plan.**

REPORT OUT – GROUP A1- MAY 26, 2010

Breakout Session I: Wednesday afternoon

1. What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?

Where effectiveness is high and low or none
Continued use good for right oil – remove tier 1 to get particle size – overall picture everyday
Continuous monitoring of water column rather than discrete events
Surface vs subsurface dispersant – amount of weathering
GPS routes – see if boats are located where planes are near
Better placement of tier 2 sampling vessels
Property of oils on surface – weathering of source out to get properties and thickness of layer
Visual profile of oil
Treated and non-treated oil properties
Increasing amount of energy for dispersants – turbulence 1, 2 hrs after
Weathering profile – transitional phase - to see when dispersant is no longer needed
Deep water plume – know where is it
Amount of dispersant:flowrate of oil - DOR
Droplet size – deep water
Temperature effect on dispersion
Amount of mixing energy and time – deep water
Emulsion may be dispersible with multiple applications of dispersant – needs to be researched
What is causing the small droplets at the surface?
Oil emulsion is non dispersible (15-20%) and when reddish brown

Tier 1 = Eyeball aerial observation
Fluorometer confirms aerial observations
Tier 2 = Fluorometry at 1 m below
Tier 3 = multiple depths
C3 = Fluorometer
Fresh oil – tier 1
Tier 2 – proof of performance

2. What is the current state of knowledge regarding the DWH spill?

Location of plume: 1100 – 1300 m deep moving SW direction
DWH oil high in alkanes, PAH similar to reference oil, up to C30
14-21% emulsified oil – may have come from skimmer
10-15% natural water and oil – surface oil (redish brown)
Less than C15 volatilizing
Emulsified 5500-8500 centistoke
Mousse is dispersing- not as good as before
Emulsion may be destabilizing (50-60%)

C3 – calibration needed
C3 (fluorometer) gives relative trends – no level of total oil or degree of dispersion
(Need quick field tests)

3. What are the gaps in our knowledge or information?

Similar to #1
Can emulsions be dispersed with multiple applications?
When is the endpoint of effective dispersance? Look at data
Should other dispersant application methods be considered besides air (boat, subsurface)
Oil flowrate – max, min
Size of plume (volumetric)
Leaching rate from small droplets
Leaching rate - soluble components in oil
Rate of dispersant in subsurface application (how well will it disperse)
Is the plume of oil and dispersant rising together?
Resurfacing – samples needed for what is resurfacing

a. Can these gaps be addressed using information from past experience and/or the literature?

Lack of research on top surface

Data to collect:
Short Term – methane at surface, dispersant (if any), chemical dispersance vs. natural dispersance

b. If not, what information should be collected in the short and long term?

Measure concentrations of oil and dispersants through water column

Deep Water Efficacy and Effectiveness

Group A

Day 2

Develop input for the RRTs on subsurface dispersant use if the DWH release continues

MIXING –

- Dosage required – better understanding of required ratio (more systematic)
- Maximize contact time period between oil and dispersant from riser (shift wand position)
- Optimized mixing in riser – wand position (deeper is better – double or more), smaller nozzle on wand to increase fluid sheer (mixing on the small scale)
- Increase temperature of dispersant to lower viscosity – use oil to naturally heat dispersant? (collect data of droplet size as oil exits riser)
  - Oil is at 100 degrees C
  - Oil vs dispersant temperature experiments for best conditions?
- Short time of no dispersant (record data) followed by short time of dispersant usage (record data) and look for improvement to validate effectiveness

Question 1 (contd.)

DOSAGE –

- If mixing is optimal dispersant dose may be high
- Use minimum flowrate to derive DOR
  - Optimal in lab = 1:25
- Measure oil flow (estimated 15,000 barrels/day ~450gpm)
- Lower DOR is better (1:50 ~ 9gpm)
- If use the assumed 15,000 barrels/day AND 1:50 DOR, then actual dispersant flowrate stays roughly the same

What are the tradeoffs (risks/benefits) associated with this input?

Dosage Risks:

- If too low DOR, will not be getting maximized dispersion
- If high DOR, adding more dispersant to environment
- Are we optimizing dispersion?

Question 2 (contd.)

Dosage Benefits:

- Cut down need to add surface dispersants
- Create smaller droplets that may degrade faster
- Minimize surfacing

Mixing Risks:

- Lab results are based on STP and actual conditions differ
  - 5,000ft and 100 C (?)
- Opportunity cost of having to make a new "nozzle" and deployment

Mixing Benefits:

- More stable droplets
- Kept below surface
- Lower droplet size
- More efficient delivery of dispersant
- Potential for faster biodegradation (?)

Identify possible monitoring protocols in the event of continuing dispersant use

In the absence of reference control, monitor for:

- Visual monitoring may demonstrate differences between dispersant application and no application
  - Plume shape, color
- Surface and depth for chemically dispersed vs. physically dispersed oil and dispersant itself
  - Potentially measured using GCMS/GCFID
  - UVFS and LISST
- Tier 1 visual monitoring at surface with quantification of oil with aerial remote sensing
  - Collect images

RECORDERS NOTES – GROUP B – MAY 26, 2010

Breakout Session I: Wednesday afternoon

1. What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?

   Unknowns at depth

   - Contact efficiency between dispersant and oil
   - Release rate of oil and gas
   - Dispersion efficiency
   - Mixing energy at injection point
   - Dispersion at depth (pressure effects)
   - Temperature of released oil
   - Weathering of oil in rising plume (dissolution, vapor stripping)
   - Emulsion formation and dispersion under pressure
   - Destabilization of emulsions as pressure decreases
   - Emulsion formation in the rise zone before it hits the surface
   - Biodegradation rate on droplets at pressure and at bottom temperature
   - Movement at depth
   - Sedimentation of dispersed oil from depth
   - Biological uptake

   Unknowns at the surface

   - Langmuir circulation potential for mixing
   - Is advection fast enough to eliminate buildup

   Unknowns for airborne fate

   - BTEX levels above oil slick
   - Suppression of VOCs when using dispersants
   - Levels of 2-butoxy ethanol from spring
   - Atmospheric breakdown and toxicity of 2-butoxy ethanol and other products

2. What is the current state of knowledge regarding the DWH spill?
   - Surface models are effective and continuously improving
   - SMART protocols are improving
   - Increase of at depth sampling
   - Well researched region (oceanographic and ecological studies)
   - Well established baseline data
   - Airborne application protocols are established
   - Improved NEBA for dispersant use

3. What are the gaps in our knowledge or information?
    a. Can these gaps be addressed using information from past experience and/or the literature?
        - Norwegian experiment
        - Ixtoc 1

    b. If not, what information should be collected in the short and long term?

    Short Term
        - Remote sensing of the dispersed area
        - Nested models
        - Smaller grid sizes on models
        - Further offshore surface sampling, either as increased SMART sampling or separate sampling regime
        - Fixed stations or boat station monitoring sensing in the operational zone(continuous monitoring, water quality monitoring)
        - Establishing criteria for cease of dispersant operations
        - Guidelines for surface turbulence and dispersant effectiveness
        - Contact efficiency between dispersant and oil
        - Release rate of oil and gas
        - Mixing energy at injection point
        - Temperature of released oil

    Long Term
        - Better coupling between offshore and onshore hydrodynamic models (LaGrangian vs. Eulerian) L
        - Dispersion efficiency
        - Dispersion at depth (pressure effects)

RECORDERS NOTES – GROUP B – MAY 27, 2010

Breakout Session II: Thursday morning

1. Develop input for the RRTs on aerial and subsurface dispersant use if the DWH release continues.

    a. What are the tradeoffs (risks/benefits) associated with this input?

Benefits

Reduces threat distance and protects shorelines
Probable increase of biodegradation rate (result of smaller particles)
Inhibits emulsion formation=reduces bulk volume of pollutants
Reduces waste management
Potential reduction of VOC in air

Risks

Trades shoreline impact for water column impact
Increases uncertainty of fate
Increased sedimentation rate

2. Identify possible monitoring protocols in the event of continuing dispersant use.

- Measure Size and shape of plume
    - With and without subsurface injection of dispersant
    - Sonar monitoring of plume size and morphology (tilt)
        - Plume size increasing= greater dispersion=better effectiveness
    - More plume monitoring in the rising plume at a variety of depths
    - Important for transport modeling
        - Development of boundaries and constraints on estimates
    - Measures needed
        - Water Temperature
        - Particle size distribution
        - Fluorescence monitoring of dispersant
        - TPH

- Define geographic area/water volume of concern
    - Estimates for scale of impact (first order approximation)
        - Based on current application rates
        - Based on maximum concentration in that volume (worst case scenarios)
        - Scenarios for surface water, onshore, deepwater plumes
    - Important for NEBA analysis

- Create an environmental review committee to advise SSCs
    - Clearinghouse for environmental data
    - Multi-agency and academia
    - Meeting regularly
    - Focused on immediate operational and scientific advice
    - eg. Rapid evaluation of dispersant options
        - Product selection based on:
            - Effectivenesss
            - Toxicity
            - Modeling
            - NEBA
            - Environmental conditions

- Surface layer water quality monitoring (profile of upper 10 m)
    - Concerns of cumulative loading of water (oil, dispersant)
    - Size of monitoring zone
        - Based on anticipated advection and dispersant application
    - Tests of concern
        - TPH
        - TPAH
        - DO
        - Salinity/ Temperature
        - VOA
        - BOD
        - Surfactant monitoring (possible?)
        - Tox testing (?)

- Air monitoring of same surface water quality zone
        - BTEX/VOC levels
        - 2-butoxy ethanol (in case of corexit 9527)
    - Aerial spectral monitoring

REPORT OUT – GROUP B – MAY 26, 2010 (USED RECORDERS NOTES)

Breakout Session I: Wednesday afternoon

1. What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?

   Unknowns at depth

   - Contact efficiency between dispersant and oil
   - Release rate of oil and gas
   - Dispersion efficiency
   - Mixing energy at injection point
   - Dispersion at depth (pressure effects)
   - Temperature of released oil
   - Weathering of oil in rising plume (dissolution, vapor stripping)
   - Emulsion formation and dispersion under pressure
   - Destabilization of emulsions as pressure decreases
   - Emulsion formation in the rise zone before it hits the surface
   - Biodegradation rate on droplets at pressure and at bottom temperature
   - Movement at depth
   - Sedimentation of dispersed oil from depth
   - Biological uptake

   Unknowns at the surface

   - Langmuir circulation potential for mixing
   - Is advection fast enough to eliminate buildup

   Unknowns for airborne fate

   - BTEX levels above oil slick
   - Suppression of VOCs when using dispersants
   - Levels of 2-butoxy ethanol from spring
   - Atmospheric breakdown and toxicity of 2-butoxy ethanol and other products

2. What is the current state of knowledge regarding the DWH spill?
   - Surface models are effective and continuously improving
   - SMART protocols are improving
   - Increase of at depth sampling
   - Well researched region (oceanographic and ecological studies)
   - Well established baseline data
   - Airborne application protocols are established
   - Improved NEBA for dispersant use

3. What are the gaps in our knowledge or information?
    a. Can these gaps be addressed using information from past experience and/or the literature?
        - Norwegian experiment
        - Ixtoc 1

    b. If not, what information should be collected in the short and long term?

    Short Term
        - Remote sensing of the dispersed area
        - Nested models
        - Smaller grid sizes on models
        - Further offshore surface sampling, either as increased SMART sampling or separate sampling regime
        - Fixed stations or boat station monitoring sensing in the operational zone(continuous monitoring, water quality monitoring)
        - Establishing criteria for cease of dispersant operations
        - Guidelines for surface turbulence and dispersant effectiveness
        - Contact efficiency between dispersant and oil
        - Release rate of oil and gas
        - Mixing energy at injection point
        - Temperature of released oil

    Long Term
        - Better coupling between offshore and onshore hydrodynamic models (LaGrangian vs. Eulerian) L
        - Dispersion efficiency
        - Dispersion at depth (pressure effects)

Group B: Fate and Behavior

Fate And Transport: Benefits

- Reduces threat distance and protects shorelines
- Probable increase of biodegradation rate
- Inhibits emulsion formation
- Reduces pollutant bulk and waste management
- Potential reduction of VOC in air

Fate and Transport: Risks

- Trades shoreline impact for water column impact
- Increases uncertainty of fate
- Increased sedimentation rate

1. Create an environmental review committee to advise SSCs

- Clearinghouse for environmental data
- Multi-agency and academia
- Meeting regularly for entire course of spill
- Focused on immediate operational and scientific advice
- eg. Rapid evaluation of dispersant options
  - Product selection based on:
    - Effectivenesss
    - Toxicity
    - Modeling
    - NEBA
    - Environmental conditions

2. Measure Size and shape of Rising Plume

- With and without subsurface injection of dispersant
- Sonar monitoring of plume size and morphology (tilt)
  - Plume size increasing---greater dispersion---better effectiveness
- More plume monitoring in the rising plume at a variety of depths
- Important for transport modeling
  - Development of boundaries and constraints on estimates
- Measures needed
  - Water Temperature
  - Particle size distribution
  - Fluorescence monitoring of dispersant
  - TPH

3. Define geographic area/water volume of concern

- Estimates for scale of impact
- first order approximation
  - Based on current application rates
  - Based on maximum concentration in that volume (worst case scenarios)
  - Scenarios for surface water, onshore, deepwater plumes
- Important for NEBA analysis
- NOAA/EPA deep water sub surface dispersed plume monitoring

4. Surface layer water quality monitoring

- Profile of upper 10 m
  - Concerns of cumulative loading of water (oil, dispersant)
  - Size of monitoring zone
    - Based on anticipated advection and dispersant application
  - Tests of concern
    - TPH
    - TPAH
    - DO
    - Salinity/ Temperature
    - VOA
    - BOD
    - Surfactant monitoring (possible?)
    - Tox testing (?)

5. Air monitoring of same surface water quality zone

- BTEX/VOC levels
- 2-butoxy ethanol (in case of corexit 9527)
- Aerial spectral monitoring

RECORDERS NOTES – GROUP C – MAY 26 2010

Breakout Session I: Wednesday afternoon

1. What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?
    - **Much less known about deep ocean systems compared to surface water**
    - **Biochemical, trophicdynamics effects of the dispersant rate**
    - What specifically is at risk?
    - What are the receptor species?
    - Life histories of local species, migration, feeding habits
    - **Identify species at risk (migration, feeding habits, life histories, reproductive/ recruitment strategies)**
    - What are the reproductive strategies/recruitment of the species affected?
    - What parts of the ecosystem are affected?
    -
    - **Dispersant effect of oxygen levels and cycling, modeling, maximum rates of application**
    - How much will it affect the nutrient recycling, general efficiency of food chain
    - **What is the particle size distribution as a function of depth, dispersant application rate**
    - Emphasis needs to be put on water scale when considering effects
    - **Understand the biodegradation rates, microbial structure and function**
    - Evaluate the need for another team for data analysis
    - Look at seasonal dynamics etc of oxygen demand
    - Naval research lab organics, hydrocarbons
    - Microbial structure and function
    - **Scavenging particle interactions, oil-mineral aggregate formation at source and throughout water column**
    - **Transport dynamics of deep water ocean currents**
    - Rate of water absorption
    - Unknown latent effects, persistence?
    - How much is the dispersant/spill affecting the oxygen demand compared to other natural seeps and sources?
    - Follow the fate
    - **Evaluate the tradeoffs between dispersant application costs vs surface reduction in oil**
    - Percent effectiveness of the seafloor dispersant application
    - **Further research on where dispersion occurs in the water column**
    - Transport to surface?
    - Does the addition of dispersant change the microbial degradation due to selective metabolism
    - Effectiveness of natural dispersion

- Knowing the downstream flux of oil residue from the spill to the seafloor

2. What is the current state of knowledge regarding the DWH spill?

- MMS report on gulf of mexico deep water resources (2000-049 Review of list for GOM including area, deep water fish, fauna and seepage)
- MMS – vulnerability of DW species to oil spills
- Natural hydrocarbon seepage in the GOM, 40 MG/year
- Receptor paper by Alan Mearns
- Existing reports e.g. MMS, NOAA
- Deep water species in the GOM, Kathys reference
- Preliminary modeling
- Preliminary monitoring data (Fluorometry data, Particle size analysis, Temperature, Salinity, D.O., Hydrocarbon, Acute toxicity , Acoustic data, sonar, Genomics)

- Looking at microbial structure, Berkley
- *None of the info listed above is considered "complete"

3. What are the gaps in our knowledge or information?
    i. Models not validated from #2
    ii. Life history of benthic biota
    iii. Migratory patterns, residence time
    iv. Incomplete data
    v. Microbial degradation rates in deep ocean on hydrocarbon seeps
    vi. Byproducts
    vii. Chronic toxicity of benthic biota
        1. Leads to community and ecosystem effects
        2. Comparison of bioaccumulation/bioavailability between different droplet sizes
        3. Comparison of toxicity and environmental impact of natural vs chemically enhanced dispersed oil
    viii. Weighing the costs/benefits, and tradeoffs
    ix. Species avoidance of oil?
    x. Evaluate the tradeoffs between dispersant application costs vs quantitative surface expression in oil
    xi.

    b. Can these gaps be addressed using information from past experience and/or the literature?

- Chronic and acute toxicology cannot apply to these deep water settings, some data but we have large gaps
- In many cases we can't trust previous techniques
    - Advances in microbiology technology
- Existing studies concerning deep water toxicity of pesticides on forams

c. If not, what information should be collected in the short and long term?
    - Formulation of biogeochemical rates wrt fuel transport and sedimentation
    - Early life stage studies, laboratory or caging

RECORDERS NOTES – GROUP C – MAY 27 2010

Breakout Session II: Thursday morning

1. Develop input for the RRTs on subsurface dispersant use if the DWH release continues.
    a. What are the tradeoffs (risks/benefits) associated with this input?

BENEFITS

- Offshore/nearshore biological tradeoffs
- Surface impacts vs. water column impacts
- Initial evidence of greater efficiency with subsurface/point source application vs. aerial application
- Observed reduction in volatile organics at surface w.r.t. personnel safety
- Enhances the interaction between oil and suspended particulate material
- accelerated microbial degradation through increased bioavailability
- more rapid recovery of downward sulfate diffusion and upward methane diffusion related to shallow sediment geochemistry
- Based on current knowledge confines the aerial extent of impact
    - Current impact zone is far less than 50 km
- Reduction emulsified oil at the surface
- Reduction of phototoxic impacts

RISKS

- Increases the extent of impact at depth
    - Biological impacts to deep water pelagic/benthic organisms
    - Concern with oxygen depletion (Note: 0.7 µg C/L/day tPAH *Coffin)
    - Release of VOCs in the water column
- Change in microbial community diversity, structure, and function
    - Change in trophic level dynamics
    - Leading to changes in key biogeochemical cycles
- Risk assessment should consider volume of Horizon spill relative to natural seepage
- Future application rates unknown with future operations (small contained high concentration zone compared to larger lower concentration zone with the possibility of future growth)
- Re-coalescing and movement to surface remotely – surface slick
- Exhaust dispersant supply

Based on the net benefit, but recognizing incomplete information, the group agrees with subsurface dispersant injection as an immediate option.

2. Identify possible monitoring protocols in the event of continuing dispersant use.
    - Robust deep ocean toxicity studies

    - Application of research done with acute toxicity on forams, possibility of chronic studies (LC50, EC50)
    - Identify control areas
    - Caged studies in the plume
    - Identify surrogate/indicator species for impacts over a range of trophic levels
    - Identify key species of concern (migrating fauna?)
    - Microbial genomics
    - Long term biological effects for resident species with baseline information
- Biogeochemical monitoring
    - Petroleum degradation rates (C14 labels)
    - Microbial production and function (3H thymodine/Genomics)
    - Community diversity (16S RNA)
    - Background parameters (DOC, POC, DIC, concentration and dC13)
    - Bioavailability of the oil as a function of particle size

- Physical/chemical parameters
    - UV Fluorometry (Including FIR)
    - Monitor the particle size distribution of the oil as function of space and time (LISST particle counters)
    - Current velocity (ADCP)
    - Chemical properties CTD (oxygen, salinity, pH, SPM)
    - Chemical properties of the oil as a function of space and time (GC-MS)
    - Potential of acoustic monitoring (3.5 and 12 khz)

Use of data from all of the above for the development of predictive models.

- **Validation!**

Group C: Biological Effects on Deep Water Ecosystem; Subsurface Application

Report Out I: Wednesday, May 26, 2010

Deep Ocean: Needed Knowledge to Give Input to RRTs

- **Much less known about deep ocean systems compared to surface water**
- **Biochemical, trophic dynamics effects of the dispersant rate**
- **Identify species at risk (migration, feeding habits, life histories, reproductive/ recruitment strategies)**
- **Dispersant effect of oxygen levels and cycling, modeling, maximum rates of application**
- **What is the particle size distribution as a function of depth, dispersant application rate**
- **Understand the biodegradation rates, microbial structure and function**
- **Scavenging particle interactions, oil-mineral aggregate formation at source and throughout water column**
- **Transport dynamics of deep water ocean currents**
- **Evaluate the tradeoffs between dispersant application costs vs surface reduction in oil**
- **Further research on where dispersion occurs in the water column**

Deep Ocean: Current Knowledge

- Natural hydrocarbon seepage in the GOM, 40 MG/year
- Existing reports e.g. MMS, NOAA
- Preliminary modeling
- Preliminary monitoring data (Fluorometry data, Particle size analysis, Temperature, Salinity, D.O., Hydrocarbon, Acute toxicity , Acoustic data, sonar, Genomics)

Deep Ocean: Gaps In Knowledge

- Model validation of subsurface dispersion and biogeochemical cycles
- Byproducts
- Migratory patterns, residence time
- Comparison of toxicity and environmental impact of natural vs chemically enhanced dispersed oil
- Evaluate the tradeoffs between dispersant application costs vs quantitative surface expression in oil

Deep Ocean: Can These Gaps be Addressed?

- Chronic and acute toxicology cannot apply to these deep water settings, some data but we have large gaps
- In many cases we can't trust previous techniques
  - Advances in microbiology technology
- Existing studies concerning deep water toxicity of pesticides on forams

Group C: Biological Effects on Deep Water Ecosystem; Subsurface Application

Report Out II: Thursday, May 27, 2010

Tradeoffs of Subsurface Dispersant Application

RISKS

- **Increases the extent of impact at depth**
  - **Biological impacts to deep water pelagic/benthic organisms**
  - **Concern with oxygen depletion (Note: 0.7 µg C/L/day tPAH)**
  - **Release of VOCs in the water column**
- **Change in microbial community diversity, structure, and function**
  - **Change in trophic level dynamics**
  - **Leading to changes in key biogeochemical cycles**
- **Risk assessment should consider volume of Horizon spill relative to natural seepage**
- **Future application rates unknown with future operations (small contained high concentration zone compared to larger lower concentration zone with the possibility of future growth)**
- **Re-coalescing and movement to surface remotely – surface slick**
- **Exhaust dispersant supply**

Tradeoffs of Subsurface Dispersant Application

BENEFITS

- **Offshore/near shore biological tradeoffs**
- **Surface impacts vs. water column impacts**
- **Initial evidence of greater efficiency with subsurface/point source application vs. aerial application**
- **Observed reduction in volatile organics at surface w.r.t. personnel safety**
- **Enhances the interaction between oil and suspended particulate material**
- **Accelerated microbial degradation through increased bioavailability**
- **More rapid recovery of downward sulfate diffusion and upward methane diffusion related to shallow sediment geochemistry**
- **Based on current knowledge confines the aerial extent of impact**
  - **Current impact zone is far less than 50 km**
- **Reduction emulsified oil at the surface**
- **Reduction of phototoxic impacts**

Input!

- Based on the net benefit, but recognizing incomplete information, the group agrees with subsurface dispersant injection as an immediate option

Deep Ocean Monitoring Protocols

- Robust deep ocean toxicity studies
  - Application of research done with acute toxicity on forams, possibility of chronic studies (LC50, EC50)
  - Identify control areas
  - Caged studies in the plume
  - Identify surrogate/indicator species for impacts over a range of trophic levels
  - Identify key species of concern (migrating fauna?)
  - Microbial genomics
  - Long term biological effects for resident species with baseline information

Deep Ocean Monitoring Protocols

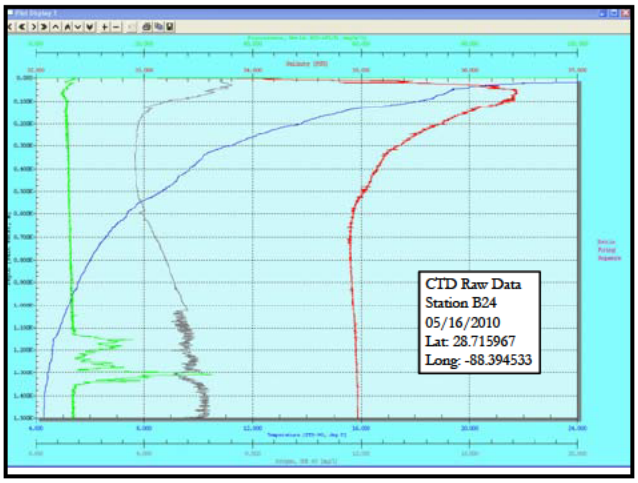
- Biogeochemical monitoring
  - Petroleum degradation rates (C14 labels)
  - Microbial production and function (3H thymodine/Genomics)
  - Community diversity (16S RNA)
  - Background parameters (DOC, POC, DIC, concentration and dC13)
  - Bioavailability of the oil as a function of particle size

Deep Ocean Monitoring Protocols

- Physical/chemical parameters
  - UV Fluorometry (Including FIR)
  - Monitor the particle size distribution of the oil as function of space and time (LISST particle counters)
  - Current velocity (ADCP)
  - Chemical properties CTD (oxygen, salinity, pH, SPM)
  - Chemical properties of the oil as a function of space and time (GC-MS)
  - Potential of acoustic monitoring (3.5 and 12 khz)

Modeling

- Use of monitoring data for the development and validation of predictive models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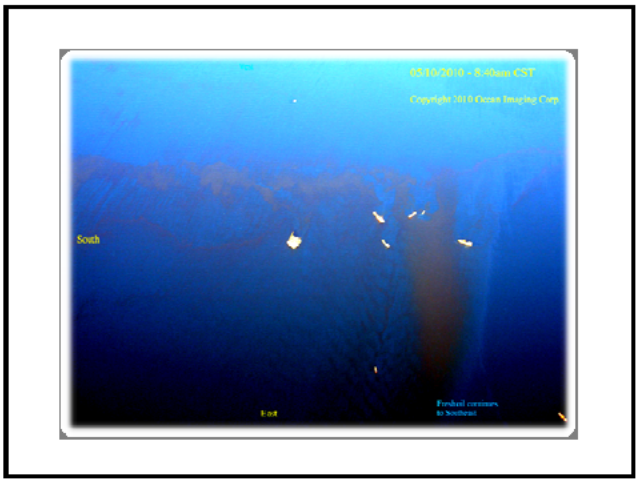
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RECORDERS NOTES – GROUP D - MAY 26 2010

Breakout Session I: Wednesday afternoon
Shallow water

1. What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?
    - Chemical composition of oil and dispersants
        - Real toxicity is from oil not corexit
        - Test corexit toxicity-short term
    - Impact to health of fisheries resources
    - Potential impact to human health from consumption of seafood
        - Assessment tool for critical habitats
    - Spatial and temporal distribution of concentrations of oil constituents
        - Knowing dissolved phase and particulate hydrocarbon
        - Toxicity on species-bioassays
        - Comparing water composition of mixtures (oil:water)
        - 3D exposure environment (depth and from shore then moving towards spill)
    - Criteria tool for long term habitat monitoring
    - Submerged aquatic vegetation
    - Physical and chemical, exposure pathways, what is being exposed (surface vs depth;LC50, LD50)
    - Federal tests for platforms also apply to products used
    - Some constituents disperse naturally
    - Surface oil moves with wind, dispersed oil in water column moves with currents
    - Effects of riverine system on how dispersants work (salinity concentrations)
    - Toxicity in water column and where is it
        - Physical and chemical dispersion, proximity to dispersant application location
    - Acute vs chronic toxicity-what information is needed to decide whether dispersant use is or is not needed
    - Define benchmarks
    - Many exposure pathways, bioassays could benefit
    - Limit on concentrations and exposure/effects. Chemistry threshold
    - Toxicity – equilibrium partitioning, chronic effects concerns, safety factor of 10 to apply to standard benchmarks
    - *Toxicity tests using rototox (?), but only at deepwater dispersion*
        - *What is known and how a rototox test works*
    - *Federally mandated bioassays in Gulf of Mexico*
    - Effects to biological components- PAH residuals as benchmarks
        - New monitoring device aside from what is used
    - DO level
    - Photo-enhanced toxicity
        - Normal lab studies do not capture this

- What larvae are out there that will absorb oil and be subjected to those phototoxicity effects.
    - What depth are these species at
- What is the exact depth of surface dispersed oil plume
- Deeper than ten meters, physical and chemical aspect of oil droplets unknown
- Monitoring at 5,000ft depth, is there a plume?
    - –using fluorescence for subsurface dispersed patterns
    - Fluorescent transects will document what happened to decision that's been made
- Baseline data prior to the oil reaching that area
    - Trace PAHs in water column
    - Gaps- having enough transect profile data moving away from shoreline (baselines)
    - Some data has been collected
- Agreement among involved parties on toxicity benchmarks
- NOAA fisheries proposed studies and monitoring for seafood safety and levels of concern (conservative levels)
- Rate of degradation of oil vs. dispersed oil
    - Biproducts of degradation, and relative toxicity
    - True residence time of volatile fractions (dispersed vs. non)-present LSU studies
    - Seasonal factors
    - Other degradation factors (e.g., dead zone)
        - Will this in turn influence dead zone, DO, etc
- Species type- exposure duration, pathways, variations amongst species; if there are numbers, what are they based on (which tox tests)?
- Rototox assay is very general thing
- Dose- disperse compounds, how long do plumes persist, are they mixed in the water column. What level is negligible?
    - Undetectable limits but still have effects on species
- Spatial and temporal fluorescence for basic infrastructure. Assist in evaluating use of dispersants.
    - Is it toxic, what are the adverse effects
- Species out there, area, concentration, threshold levels, protecting which species
    - Area, number of species and concentrations in regions
- Continual spill, risks may equal out of effected species in water column to shoreline
- Seasonality distribution of species, larvae
- Influence top of water column that feed rest of food chain will eventually affect shoreline species anyway. Tradeoffs
- How long does it last, where does it go?
- Life periods of species and how they will be effected (e.g., killifish vs. blue fin tuna)
- What biota is in the vicinity of the dispersants
- Degradation components of dispersants not well known in terms of accumulation
- Persistent components of dispersants
- Are dispersants bioaccumulated

- Information be made available for decision makers
- How toxic is dispersant, how much in relation to oil, is oil more toxic when dispersed. Is this loss acceptable knowing that it may save the shoreline….tradeoffs
- Are dispersants giving us enough relief (looking at ERMA map)? How much of a reduction will we get in oil hitting the shoreline. Relative to total volume
- Does it make a difference in the end with total amounts of oil that will and would have reached the shore had it not have been dispersed.
- What is the oil that is coming ashore now? Not sure if oil moving on shore is exactly dispersed oil or non.

2. What is the current state of knowledge regarding the DWH spill?
    - Water samples with no oil concentrations came from inshore samples prior to oil making landfall
    - Fluorescence methods to monitor subsurface dispersed oil
    - Hypoxia-EPA-mapping hypoxic zone, just mapping it, not looking at influence on biodegradation potential
    - Good to disperse if it doesn't get into coastal zone
    - Persistence of dispersant is around 7days
    - Potential bioaccumulation on some aspects of dispersants (MSDS)
    - EPA PAH datas. Priority pollutants (not full range). Push for GCMS
    - Petroleum distillates in corexit: known animal carcinogen in the MSDS for petroleum distillates
    - If use dispersants, oil in top 10m of water column will cause injury to species in that area.
    - More oil is dispersed when using dispersants at wellhead.
    - Aerial application- effectiveness drops off
    - Oil that comes ashore hasn't been dispersed. Not likely to have recoalesced
    - RRT discussion on lifting restrictions on dispersant application areas

3. What are the gaps in our knowledge or information?
    1. Can these gaps be addressed using information from past experience and/or the literature?
        - Pulling data together and synthesizing
        - Water samples throughout depth up to 5,000ft (LSU)
        - Pharmaceutical products-endocrine disrupting properties
        - IXTOC -140M barrels of oil, 2M gallons of oil applied.
        - Exxon Valdez, oil that came ashore, still have a fraction of it after 20 years
        - Leave marsh alone, it cleans itself, what are the orders of magnitude

- How much oil gets onto marsh plants dictates lethality
- Want to keep it off the nursery ground
- State dependent upon species from these habitat areas
- Pelagic fish and organisms. Bluefin tuna exp. Will we lose that species (deep water species)

2. If not, what information should be collected in the short and long term?
    - EPA, BP data compilation
    - What is the distribution of sensitive species offshore
    - Distribution of dispersed oil
        1. larva data and commercial species

- oyster and mussel examples for monitoring
- SPMD monitoring (30days-has some biofouling)
    - Benefit future dispersant decisions
-

RECORDERS NOTES – GROUP D - MAY 27 2010

Breakout Session II: Thursday morning

1. **Develop input for the RRTs on aerial and subsurface dispersant use if the DWH release continues.**
    a. **What are the tradeoffs (risks/benefits) associated with this input?**

- Report 50% loss of fisheries (menhaden-spawn in marshes, life in open ocean)
- Commercially important species –top ten meters (location marshes to open ocean)
- San Bernard shoals type of oil (dispersed or non) doesn't matter, area is already compromised
- Major fisheries in open oceans
- MSDS states no toxicity tests required
- **Consider offshore fisheries (one species against the other- inshore fisheries and shrimping grounds vs. offshore)**
- First hit for summer fishing season will be menhaden
- Southeast fisheries science center has information on species location
- No environmental impact statement required for this location
- **Scrutinize MMS document (bluefin tuna and menhaden)**
- MSDS for corexit has LC50 (consider dose)
- Does the dispersant make oil more toxic because it's more available? More animals see more of the oil. If dilution is fast enough, the species will see less of it (dose)
- Theory: increase oil in water column then "go away"
- Oil slick-worry about birds, etc, if you disperse it goes to top ten meters of water column and threatens those species. Then habitat concerns
- **Transfer risk from surface to subsurface, then worry about habitat contamination if it comes ashore**

- Lessons from Persian gulf, no concentrations in water, but dig into sediments to find oil there
- **Long term effects as opposed to short term acute effects.**
- Half life and concentration. Creating a different effect than the MSDS sheet has information for
- Subsurface water and surface water move in different directions which lowers the dose (of oil?)
- Dispersants speed up natural process which lowers the dose. Could wipe out phyto and zooplankton in dispersant areas. Fluorescence shows oil location and how effective oil dispersion is.
- Corexit breaks down relatively quickly (in a lab)
- Propylene glycol dissolves in water, dilutes rapidly, can adhere to particulates (?), its solubility is affected by propylene distillates.
- Microbes degrade soluble and non-soluble components
- **Toxicity as lethality and not so much long term chronic effects. Risk and uncertainty in terms of how much over what area, what species are there.**
- Sub lethal effects with long ranging impacts. If you contaminate habitat you extend the range of those impacts
- How much of a difference are we really making by using dispersants (looking at ERMA map)-small area of application
- What is the effectiveness of the dispersed treatment?
- Is it worth it if we're still going to have impacts to the exact habitat we're trying to protect?
    - Once you've added a volume it takes a certain time for the marsh to clear it, so the more oil there the more time.
    - 430,000gallon application with 10:1 ratio. You save approximately 1-10M gal of oil off the shore
    - Application may not be as efficacious as expected; dispersants may be over applied
    - 2 weeks ago, reevaluated dispersant application
    - EPA is pro deep dispersant application
    - Smart data shows that there is dispersion into the water column-only monitors down to 10m

    - Public perception is that the oil slick is dropped slightly into the water column, below surface, not that it is broken into small droplets.
- What is the application rate? Then you can calculate dilution rate
- Dispersant is less toxic than oil and applied in smaller concentration than oil. Thus, more worried about oil toxicity
- Dispersant may facilitate PAH uptake in organisms and increase dissolved phase of PAHs enhancing bioavailability
- Mechanisms of uptake and physical characteristics of dispersed oil (sticking to species). Bacterial degradation (much conflicting data on uptake and exposure routes)
- **Mechanisms of PAH availability and toxicity resulting from dispersant use and making PAHs more bioavailable**
- More dispersant-increase toxicity, not the dispersant itself, just what it does. Endocrine disruption, carcinogenicity
- Solely disperse deep water, need to fully know the efficacy and effects. Think they can get same dispersion with deep water injection. Believe dispersed oil will remain below pycnocline
- Halted surface water dispersion
- **Use of dispersants should continue to lessen extent of shoreline oiling. Tradeoffs with species in open ocean water column**
- Small reduction in oil (even 1%) is it beneficial? What is the objective of dispersant application
- How much of the slick are you actually getting to (about 1M gallon?)
- **Dose, duration, and spatial context**
- All an experiment, controlled or not
- A lot of marsh that hasn't been hit yet, small fraction of LA marshes have been oiled
- If you apply dispersants and it's just washing around, if it's effects are less than the oil, then what's the risk?
- If we spray it on open water, or it isn't effective, then what's downside to applying it? There is no real downside (aside from

potential unknowns of dispersants, their residence time, and toxicity)

- Can only apply dispersant when conditions are adequate (to create mixing)
- Currents, where things are going, where's the plume? Consistent plume? Kill the tight plume and not worry about everything else?
- Species sensitivity (e.g., corals would be killed by dispersed oil)
- What is your footprint damage
- More data on open oceans, how much harm is being done?
- Big uncertainty
- **Data gaps: what is being exposed, exposure time.**
- **If dispersant application mitigates a small percentage of oil in marshes, it may have a beneficial tradeoff. Are the beneficial tradeoffs acceptable?**
- Spatial mapping –not adequate density
- Too many unknowns-never going to get to a comfortable stage, even with a five year plan

2. Identify possible monitoring protocols in the event of continuing dispersant use.

- **Monitor deeper than 10meters (below 20meters or until no fluorescence doesn't work)**
- **Monitor surface to bottom across a transect from the shore to source**
    - **Gradation out from shore**
    - **If not in this spill, beneficial to future spills**
- Need grid
- **Deploy semi permeable membrane device (SPMD), passive sampling, or oysters**

    - Oysters take about 30 days to reach equilibrium
- Objectives? Detailed species questions
- Damage assessment, tracking and exposure
- What limits microbes
- **Bioaccumulation monitors at selective points along transect**
- **Concentration monitoring (dose) and exposure time**
- **How big is the footprint of dispersed oil**? Is there naturally dispersed oil in other areas; compare and measure how much dispersant is in water.
- **Measure current (subsurface) prior to application**
- **Measure DO**
    - **pH, temp, pressure, salinity, particle size, fluorometry, turbidity**
- **Monitor/measure physical parameters, put into model to figure concentration to measure toxicity**
- **Biological species indicators (indicator species, chlorophyll,)**
    - eggs or larval abnormalities-long term monitoring
- coordination with NRDA
- oil vs dispersant effects
- shrimp moving out of marshes and into ocean now
- Baseline species and behavior verse effects from oil and dispersed oil
- **Hypoxic zone**
    - **M**atch up where chemical vs DO signal are
    - Correlation between river volume (flood) and hypoxic zone
    - Baseline data
- Need to prove where the oil and dispersed oil is
- **Track oil!**
    - **Where chemicals are going, exposure regimes**
    - **Dealing with uncertainty**
- Would this data help managers?

- What is the effect of the dispersant; is it an adverse effect? If so, how much?
    - Small and localized
    - Tradeoff for keeping oil out of the marsh
- **Ecosystems will recover after oil shock to system, open ocean ecosystems may rebound faster than marsh areas; worthwhile to apply dispersants**
- **Opportunity to learn**
- Tracking unknown oil in deep sea-
- **surface, start monitoring plan NOW. Start prior to potential future surface dispersant application**
    - Data set will be beneficial in damage assessment as well
    - Beneficial for dispersant or not
- **Toxicity tests-state of the art (standard 48hour tests)**
    - Bioassays; bioassay based decision tree
        - Important for public perception
    - 24 hour acute tox screen
    - Show public toxicity levels, ease concern
- Tox tests on underwater dispersion (rototox indicates not much toxicity)
- Don't know what tests to suggest (microtox)
- Manidya, mica, alga
- Public does care –sublethal effects, chronic effects
- **Selected bioassays at selected sampling points**
    - **Water**
    - **Sediment? If it comes ashore, definitely**
- Seafood safety-marketing
- Transfer risk to 10m is lesser of evils. Dispersant use on surface okay
- Water measurements dispersants and oil
- DO measurements
- Toxicity tests: selected bioassays
- **More confidence in where oil is going**

- **Mussel watch –time aspect, before and after oil spill**
    - Long term monitoring (monthly)

Sediment doesn't necessarily reflect dispersant use…need baseline and background for oil in sediment
Sediment baselines for future

Powerpoint presentation recommendations:

- Surface application of dispersants is ok
    - Transfer risk to 10m is lesser of evils
- Monitoring to provide more confidence in where oil is going
    - Long term monitoring (monthly); grid from inshore to open ocean (past oil slick edge)
    - Passive samplers in selected areas
    - Water measurements dispersants and oil
    - DO measurements
    - Toxicity tests: selected bioassays
    - Standard CTD tests plus chlorophyll measurements

Q1: What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?

- Location, location, location
  - Oil, dispersants, critters
- Levels of concern?
  - E.g., sensitive life stages
  - Oil and dispersant constituents

Q2: What is the current state of knowledge regarding the DWH spill?

- Dispersed oil in shallow water (10m)

What are the gaps in our knowledge or information?

- Effectiveness of dispersant
- Long term effects of dispersant exposure (carcinogenicity)
- Dispersed oil effects in an estuarine/riverine/pelagic environment
- Bioavailability, bioaccumulation (SPMD)

Recommendations

- Clearinghouse for baseline data being collected
- Know dose of exposure, effects, species present and tradeoffs with habitat protection
  - Dispersed verse non dispersed oil

Recommendations

- Surface application of dispersants is ok
  - Transfer risk to 10m is lesser of evils
- Monitoring to provide more confidence in where oil is going
  - Long term monitoring (monthly); grid from inshore to open ocean (past oil slick edge)
  - Passive samplers in selected areas
  - Water measurements dispersants and oil
  - DO measurements
  - Toxicity tests: selected bioassays
  - Standard CTD tests plus chlorophyll measurements

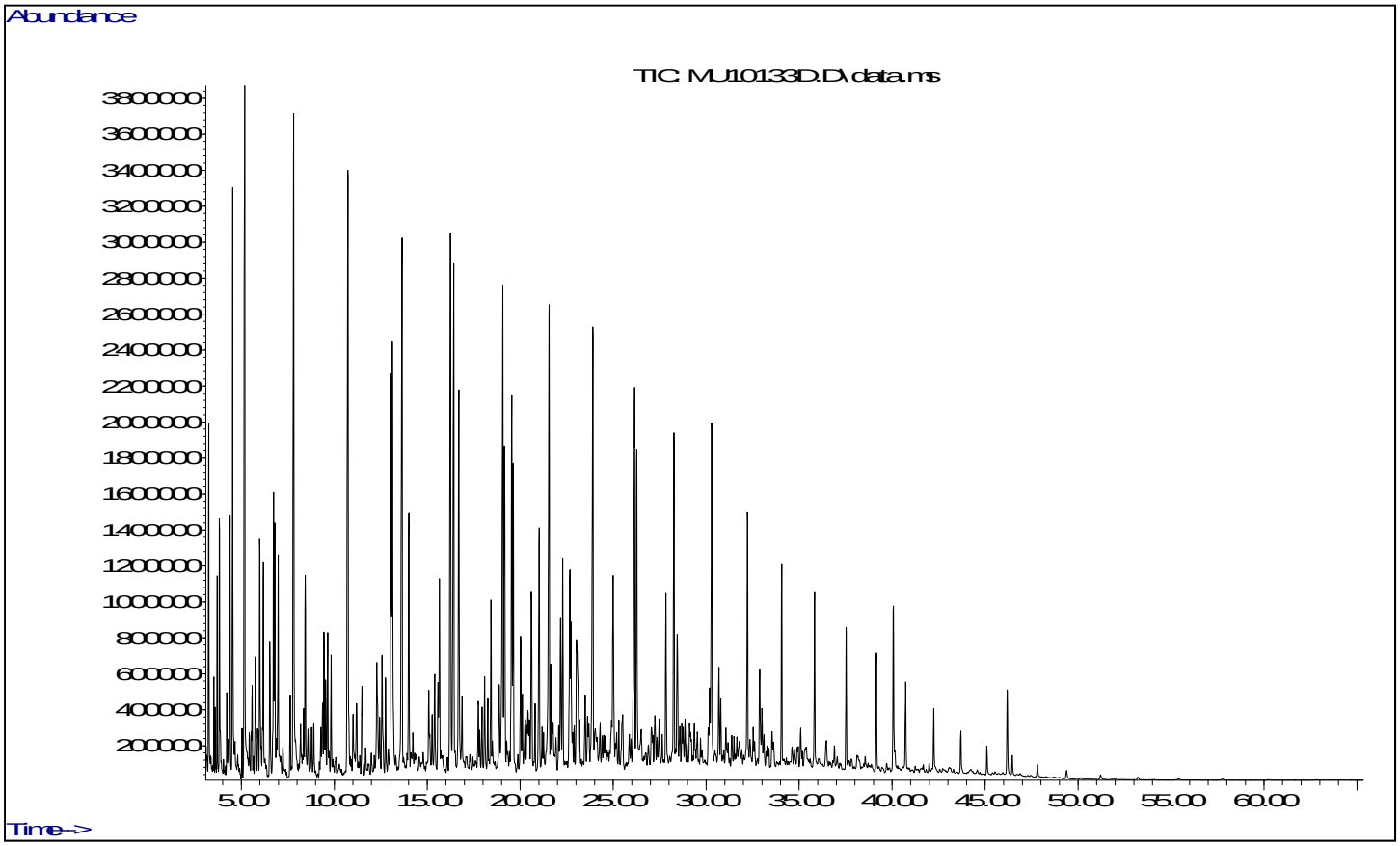
APPENDIX F

Data Courtesy School of the Coast and Environment, Louisiana State University

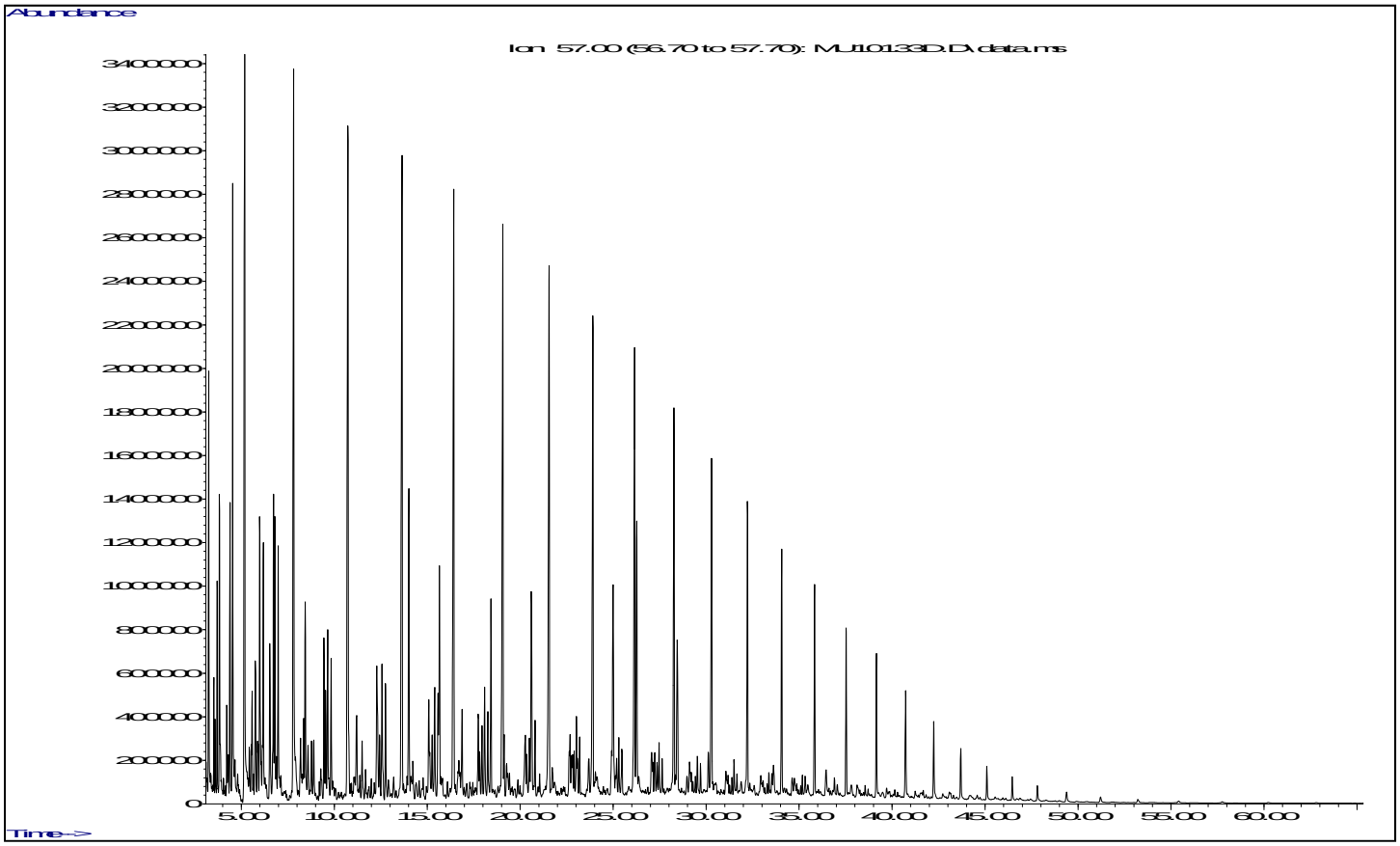
LSU ID# 2010133-02 **Source Oil, Pre-spill** **Sample Weight** 310 mg **Final Extracted Volume** 30 mL		**LSU ID# Lab Ref Oil** **South Louisiana Crude** **Sample Weight** 500 mg **Final Extracted Volume** 20 mL	
Alkane Analyte:	**Concentration (ng/mg)**	**Alkane Analyte:**	**Concentration (ng/mg)**
nC-10 Decane	2600	nC-10 Decane	2600
nC-11 Undecane	2600	nC-11 Undecane	2700
nC-12 Dodecane	2600	nC-12 Dodecane	2600
nC-13 Tridecane	2500	nC-13 Tridecane	2600
nC-14 Tetradecane	2400	nC-14 Tetradecane	2300
nC-15 Pentadecane	2000	nC-15 Pentadecane	2200
nC-16 Hexadecane	1800	nC-16 Hexadecane	2000
nC-17 Heptadecane	1700	nC-17 Heptadecane	1900
Pristane	960	Pristane	970
nC-18 Octadecane	1500	nC-18 Octadecane	1700
Phytane	770	Phytane	910
nC-19 Nonadecane	1300	nC-19 Nonadecane	1500
nC-20 Eicosane	1300	nC-20 Eicosane	1400
nC-21 Heneicosane	1100	nC-21 Heneicosane	1300
nC-22 Docosane	1000	nC-22 Docosane	1200
nC-23 Tricosane	940	nC-23 Tricosane	1100
nC-24 Tetracosane	890	nC-24 Tetracosane	1000
nC-25 Pentacosane	600	nC-25 Pentacosane	620
nC-26 Hexacosane	510	nC-26 Hexacosane	510
nC-27 Heptacosane	350	nC-27 Heptacosane	360
nC-28 Octacosane	300	nC-28 Octacosane	310
nC-29 Nonacosane	250	nC-29 Nonacosane	260
nC-30 Triacontane	230	nC-30 Triacontane	230
nC-31 Hentriacontane	150	nC-31 Hentriacontane	190
nC-32 Dotriacontane	120	nC-32 Dotriacontane	150
nC-33 Tritriacontane	100	nC-33 Tritriacontane	110
nC-34 Tetratriacontane	90	nC-34 Tetratriacontane	110
nC-35 Pentatriacontane	92	nC-35 Pentatriacontane	110
Total Alkanes	***30752***	***Total Alkanes***	***32940***

LSU ID# 2010133-02 **Source Oil** **Sample Weight** 310 mg **Final Extracted Volume** 30 mL		**LSU ID# Lab Ref Oil** **South Louisiana Crude** **Sample Weight** 500 mg **Final Extracted Volume** 20 mL	
Aromatic Analyte:	**Concentration (ng/mg)**	**Aromatic Analyte:**	**Concentration (ng/mg)**
Naphthalene	750	Naphthalene	710
C1-Naphthalenes	1600	C1-Naphthalenes	1300
C2-Naphthalenes	2000	C2-Naphthalenes	1500
C3-Naphthalenes	1400	C3-Naphthalenes	1100
C4-Naphthalenes	690	C4-Naphthalenes	590
Fluorene	130	Fluorene	100
C1-Fluorenes	340	C1-Fluorenes	270
C2-Fluorenes	390	C2-Fluorenes	270
C3- Fluorenes	300	C3- Fluorenes	240
Dibenzothiophene	53	Dibenzothiophene	56
C1-Dibenzothiophenes	170	C1-Dibenzothiophenes	210
C2-Dibenzothiophenes	220	C2-Dibenzothiophenes	280
C3- Dibenzothiophenes	160	C3- Dibenzothiophenes	240
Phenanthrene	290	Phenanthrene	200
C1-Phenanthrenes	680	C1-Phenanthrenes	360
C2-Phenanthrenes	660	C2-Phenanthrenes	340
C3-Phenanthrenes	400	C3-Phenanthrenes	200
C4-Phenanthrenes	200	C4-Phenanthrenes	84
Anthracene	6.1	Anthracene	6.2
Fluoranthene	4.2	Fluoranthene	4.5
Pyrene	8.9	Pyrene	7.1
C1- Pyrenes	68	C1- Pyrenes	43
C2- Pyrenes	84	C2- Pyrenes	31
C3- Pyrenes	96	C3- Pyrenes	31
C4- Pyrenes	54	C4- Pyrenes	20
Naphthobenzothiophene	11	Naphthobenzothiophene	7.8
C-1 Naphthobenzothiophenes	48	C-1 Naphthobenzothiophenes	30
C-2 Naphthobenzothiophenes	37	C-2 Naphthobenzothiophenes	30
C-3 Naphthobenzothiophenes	22	C-3 Naphthobenzothiophenes	25
Benzo (a) Anthracene	5.5	Benzo (a) Anthracene	5.4
Chrysene	36	Chrysene	14
C1- Chrysenes	100	C1- Chrysenes	28
C2- Chrysenes	100	C2- Chrysenes	27
C3- Chrysenes	54	C3- Chrysenes	18
C4- Chrysenes	19	C4- Chrysenes	5.6
Benzo (b) Fluoranthene	2.3	Benzo (b) Fluoranthene	1.7
Benzo (k) Fluoranthene	1.8	Benzo (k) Fluoranthene	1.5
Benzo (e) Pyrene	6.6	Benzo (e) Pyrene	2.9
Benzo (a) Pyrene	1.0	Benzo (a) Pyrene	1.0
Perylene	0 92	Perylene	0.89
Indeno (1,2,3 - cd) Pyrene	0 20	Indeno (1,2,3 - cd) Pyrene	0.22
Dibenzo (a,h) anthracene	1.3	Dibenzo (a,h) anthracene	0.92
Benzo (g,h,i) perylene	1.2	Benzo (g,h,i) perylene	1.1
Total Aromatics	***11203***	***Total Aromatics***	***8394***

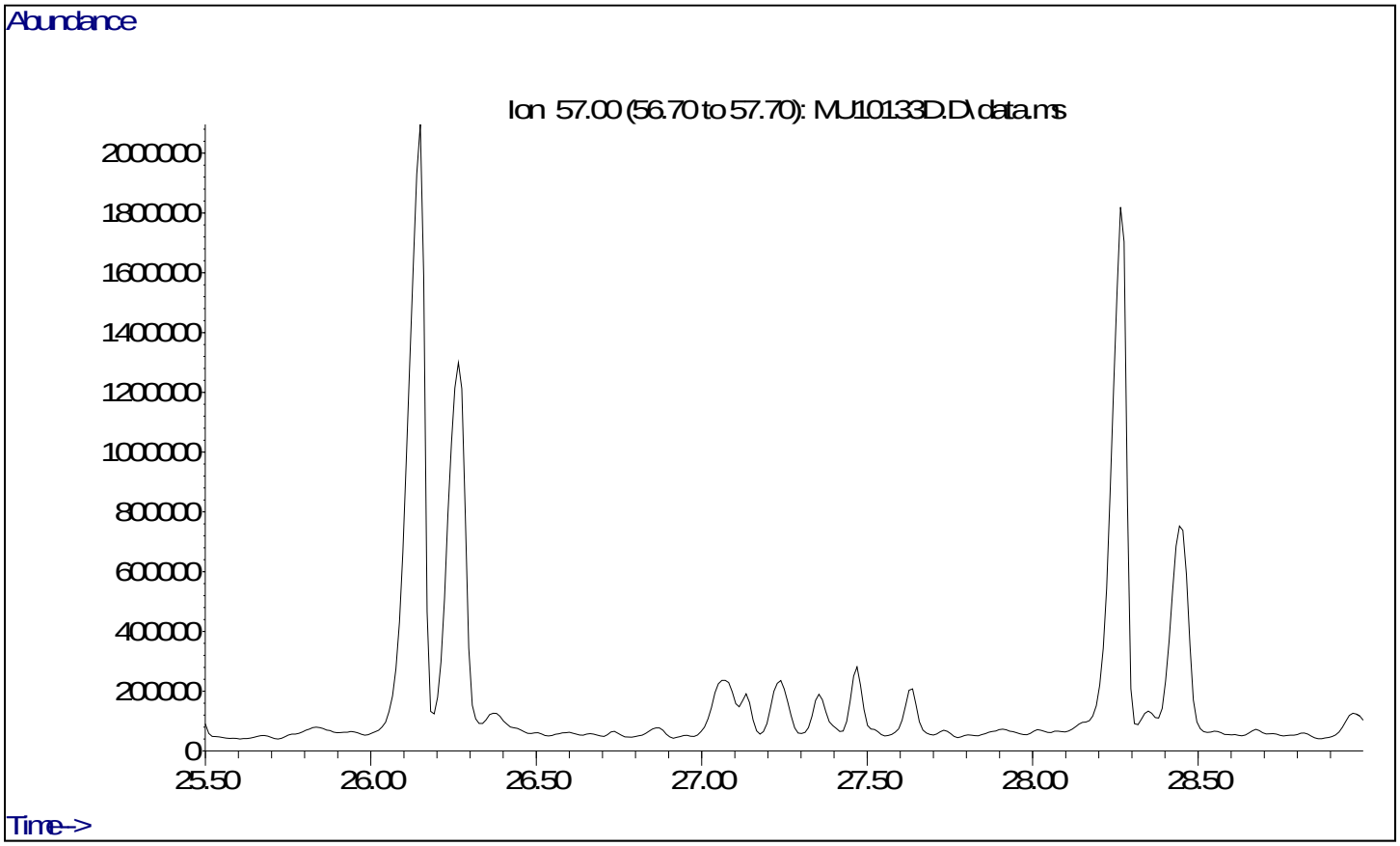
2010133-02 (Source Oil, Pre-spill) – TIC



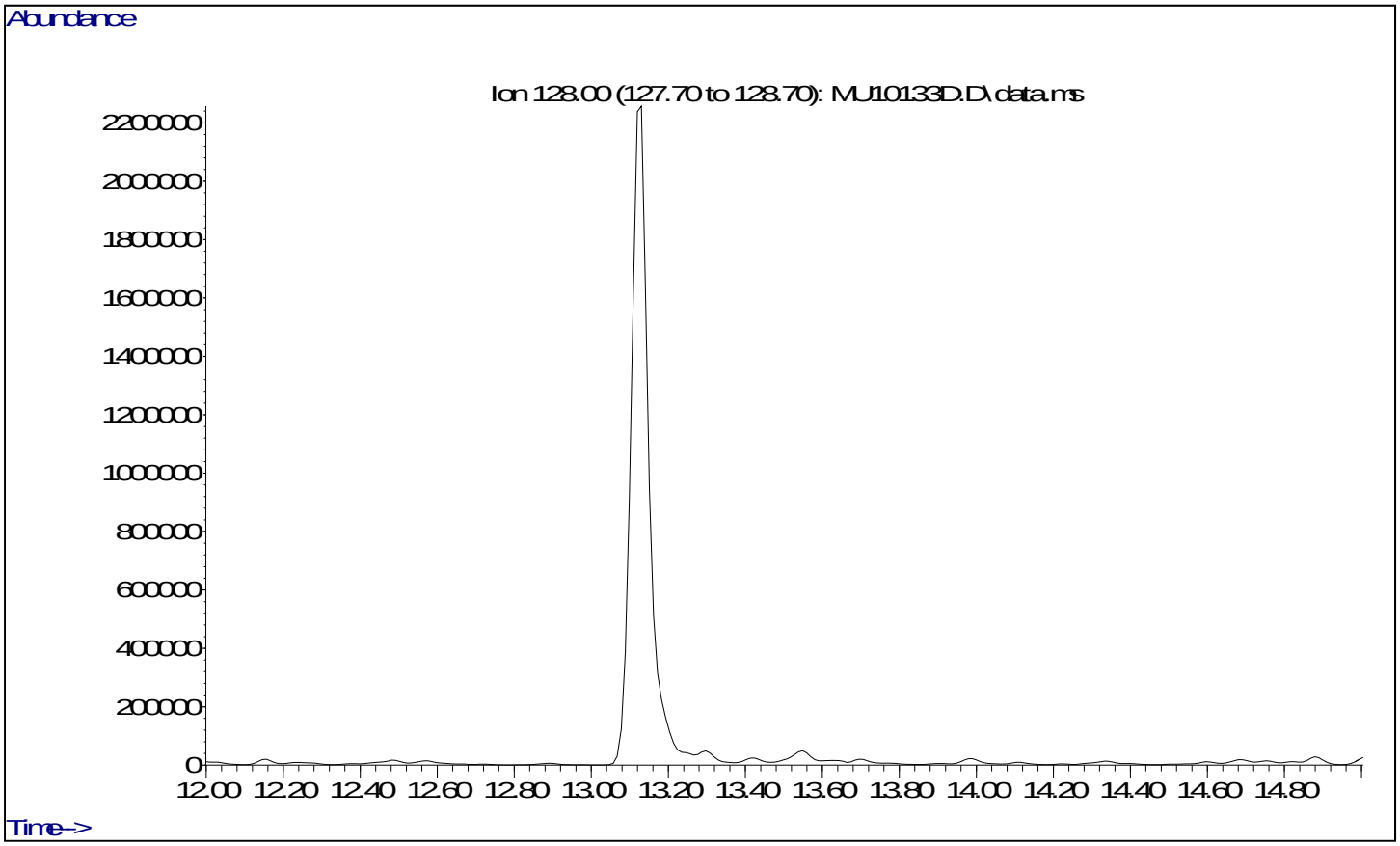
2010133-02 (Source Oil, Pre-spill) – Alkanes



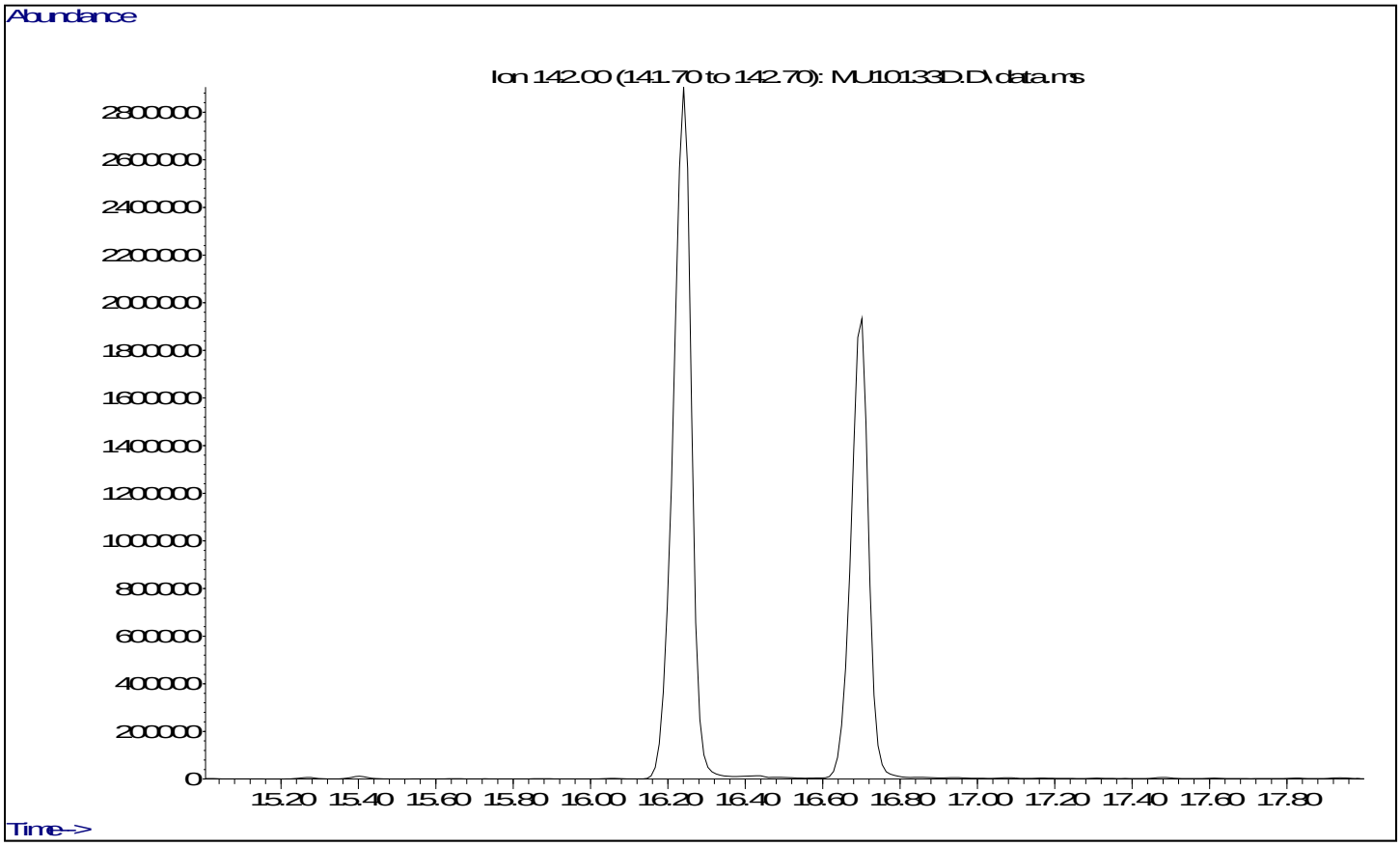
2010133-02 (Source Oil, Pre-spill) – C_{17}/Pristane, C_{18}/Phytane



2010133-02 (Source Oil, Pre-spill) – Naphthalene



2010133-02 (Source Oil, Pre-spill) – C1-Naphthalenes



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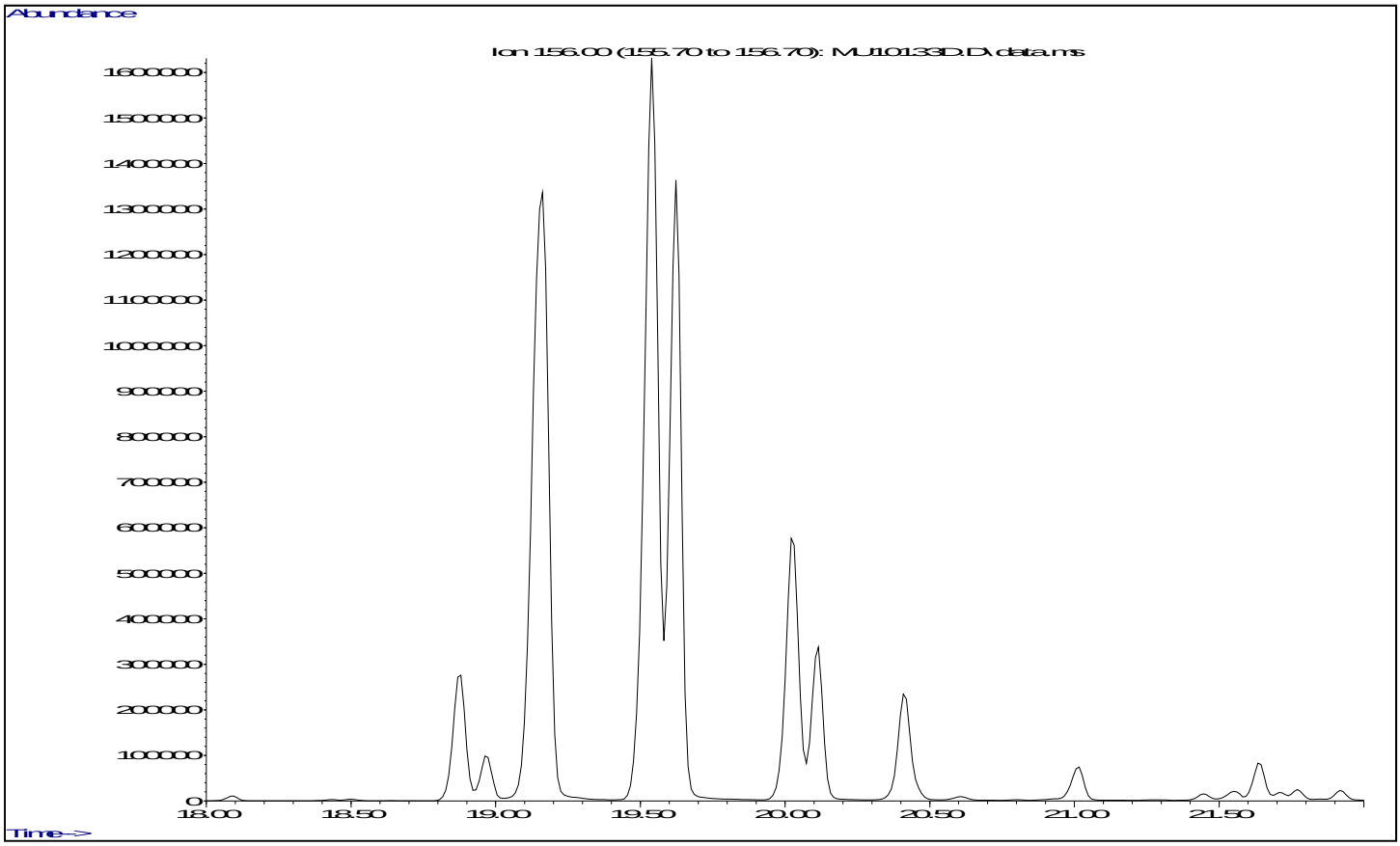
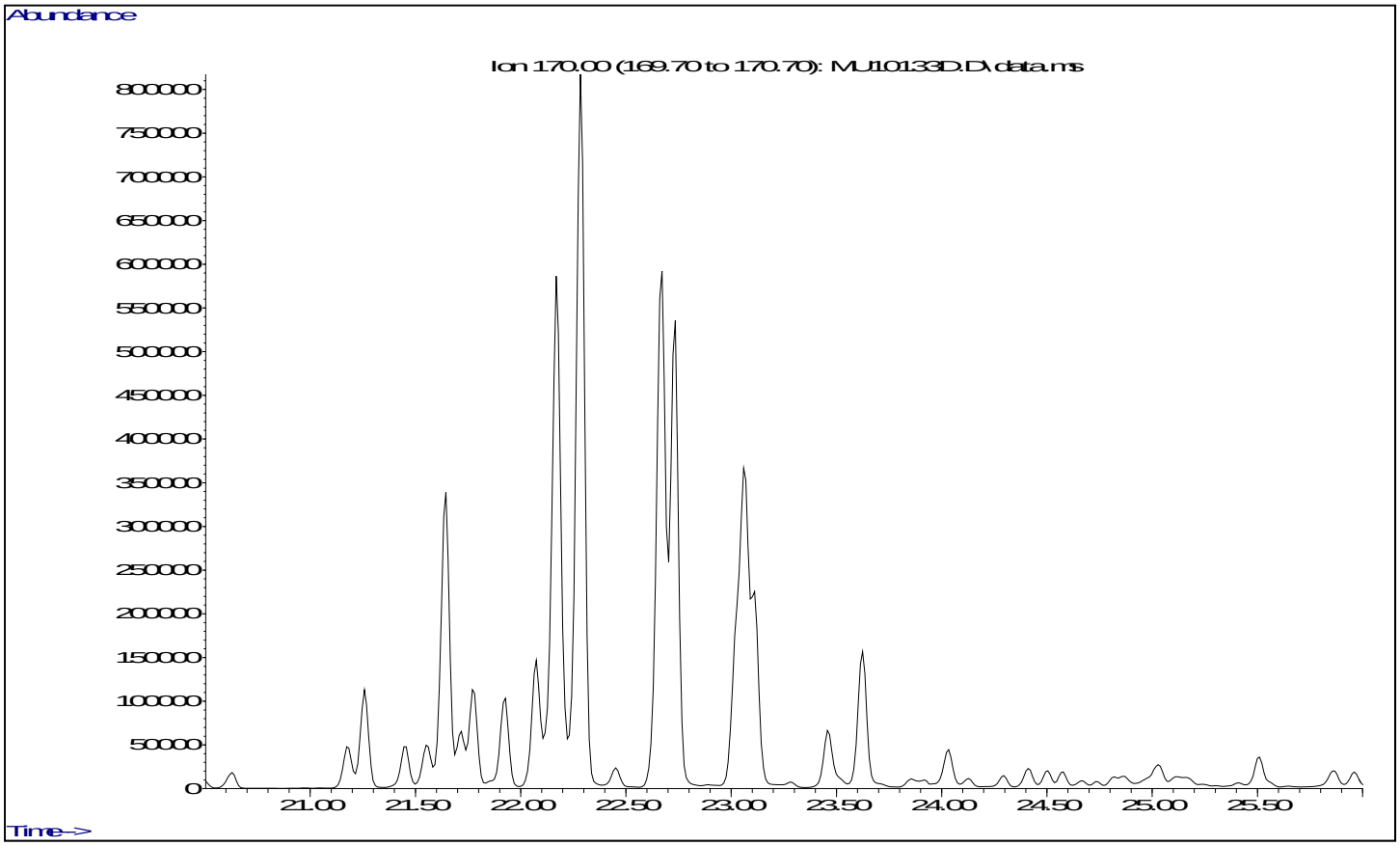
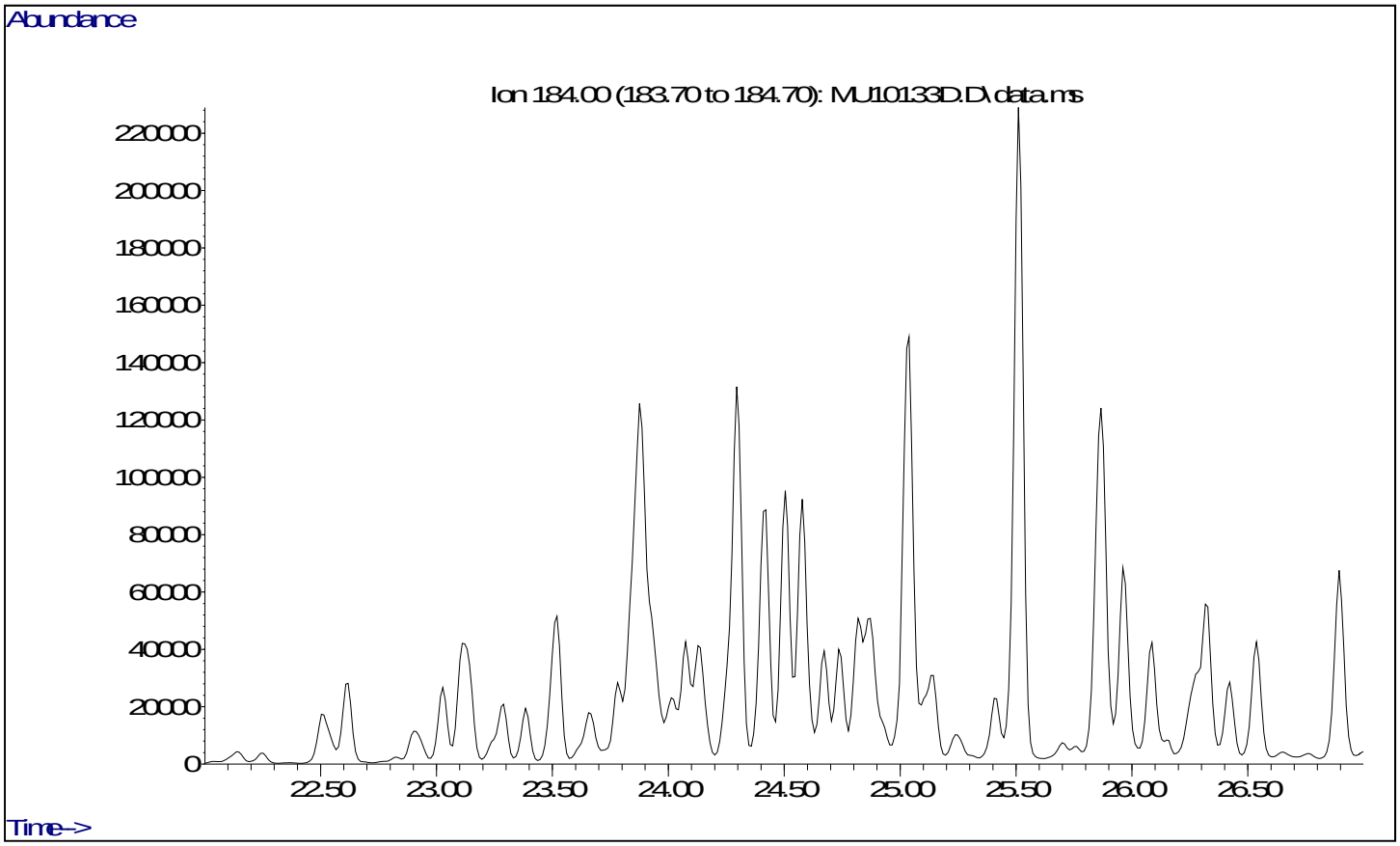


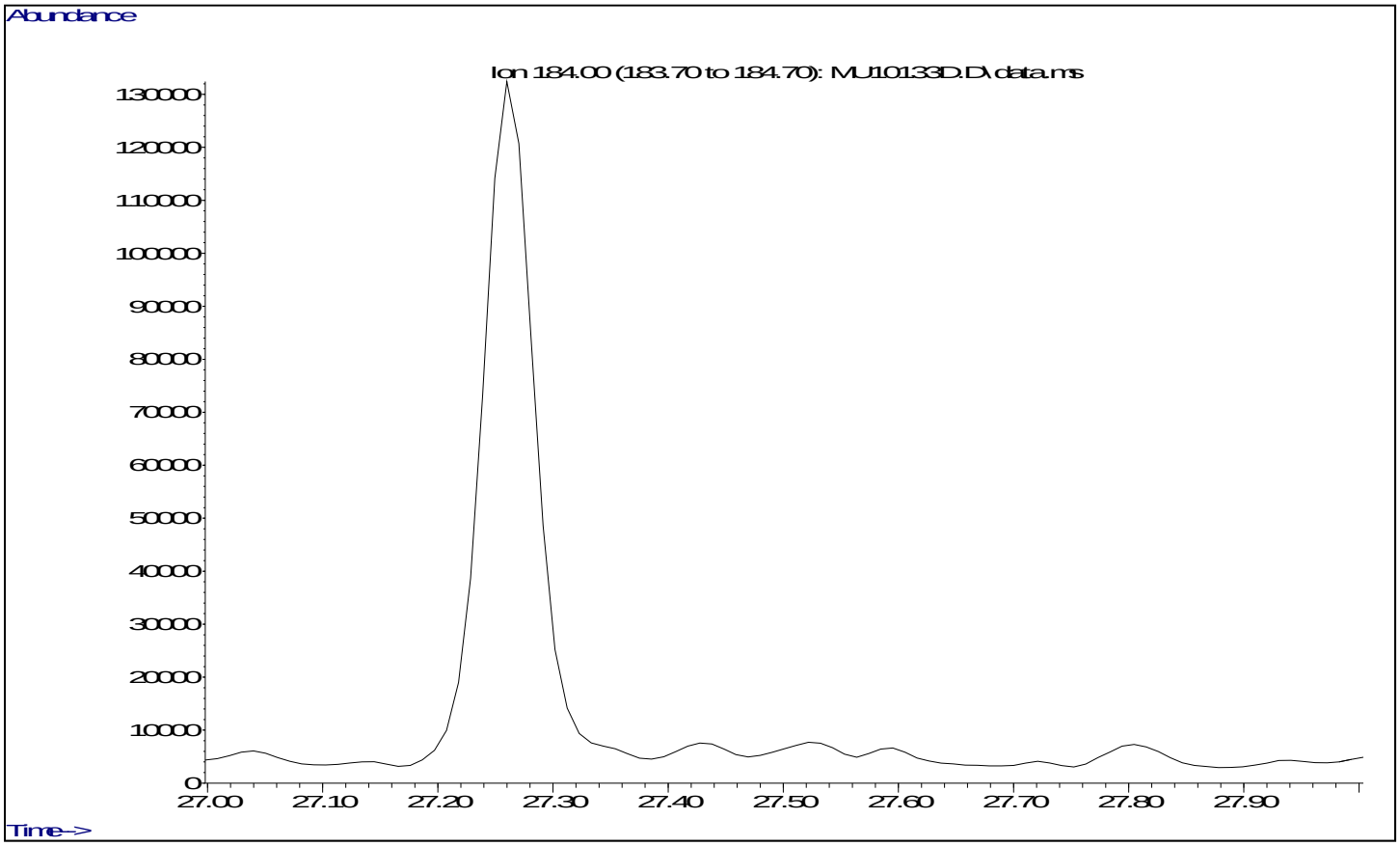
2010133-02 (Source Oil, Pre-spill) – C3-Naphthalenes



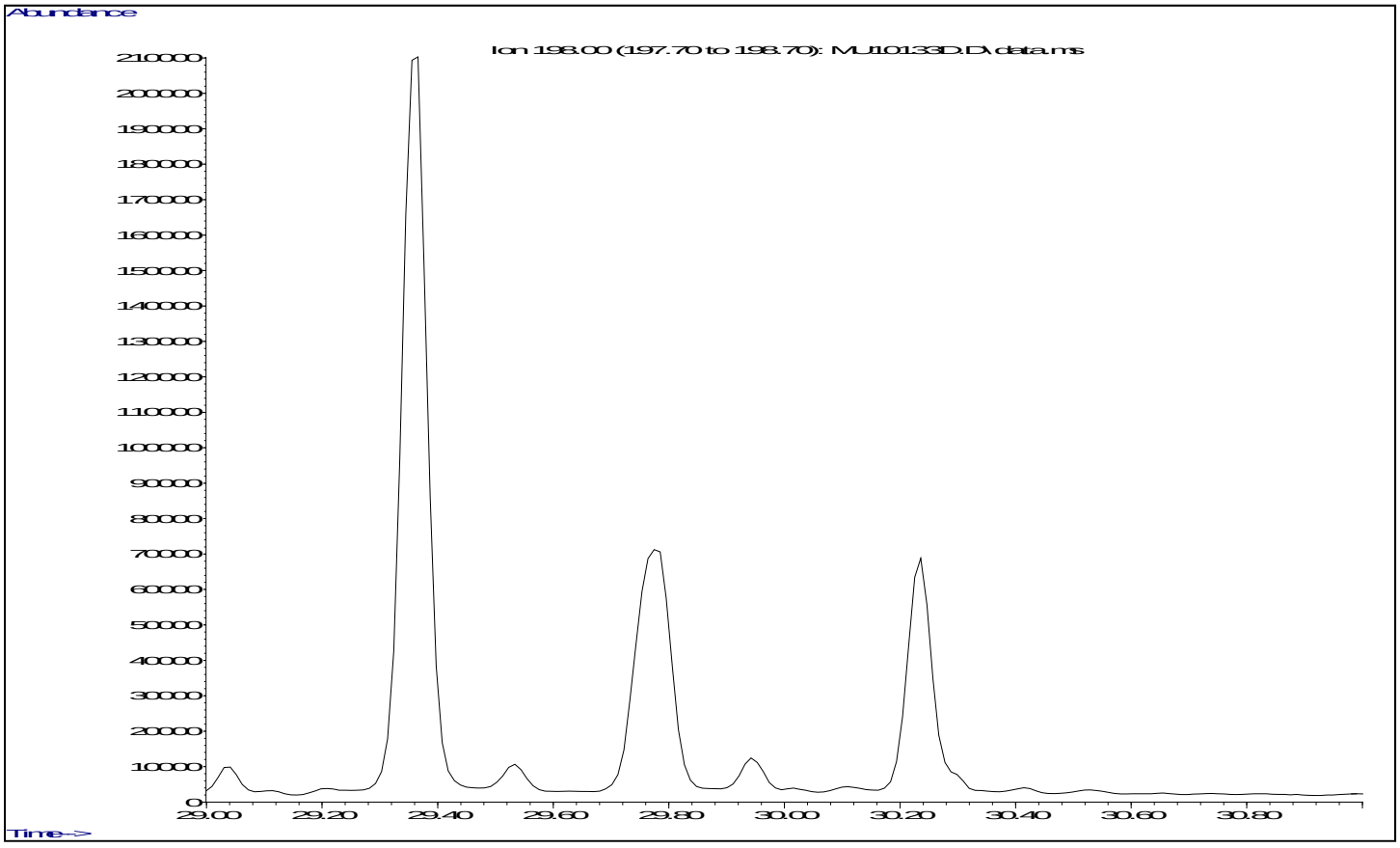
2010133-02 (Source Oil, Pre-spill) – C4-Naphthalenes



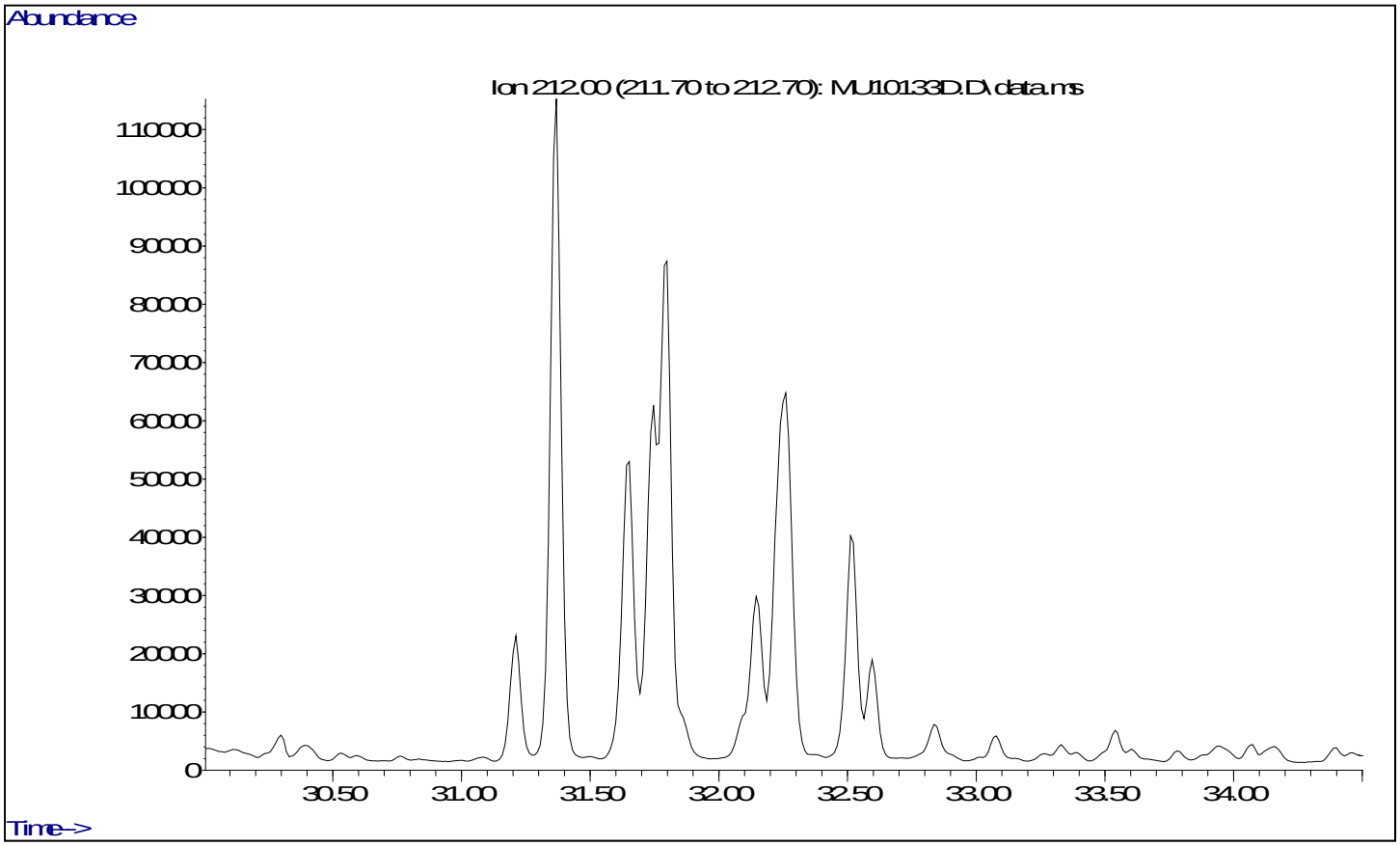
2010133-02 (Source Oil, Pre-spill) – DBT



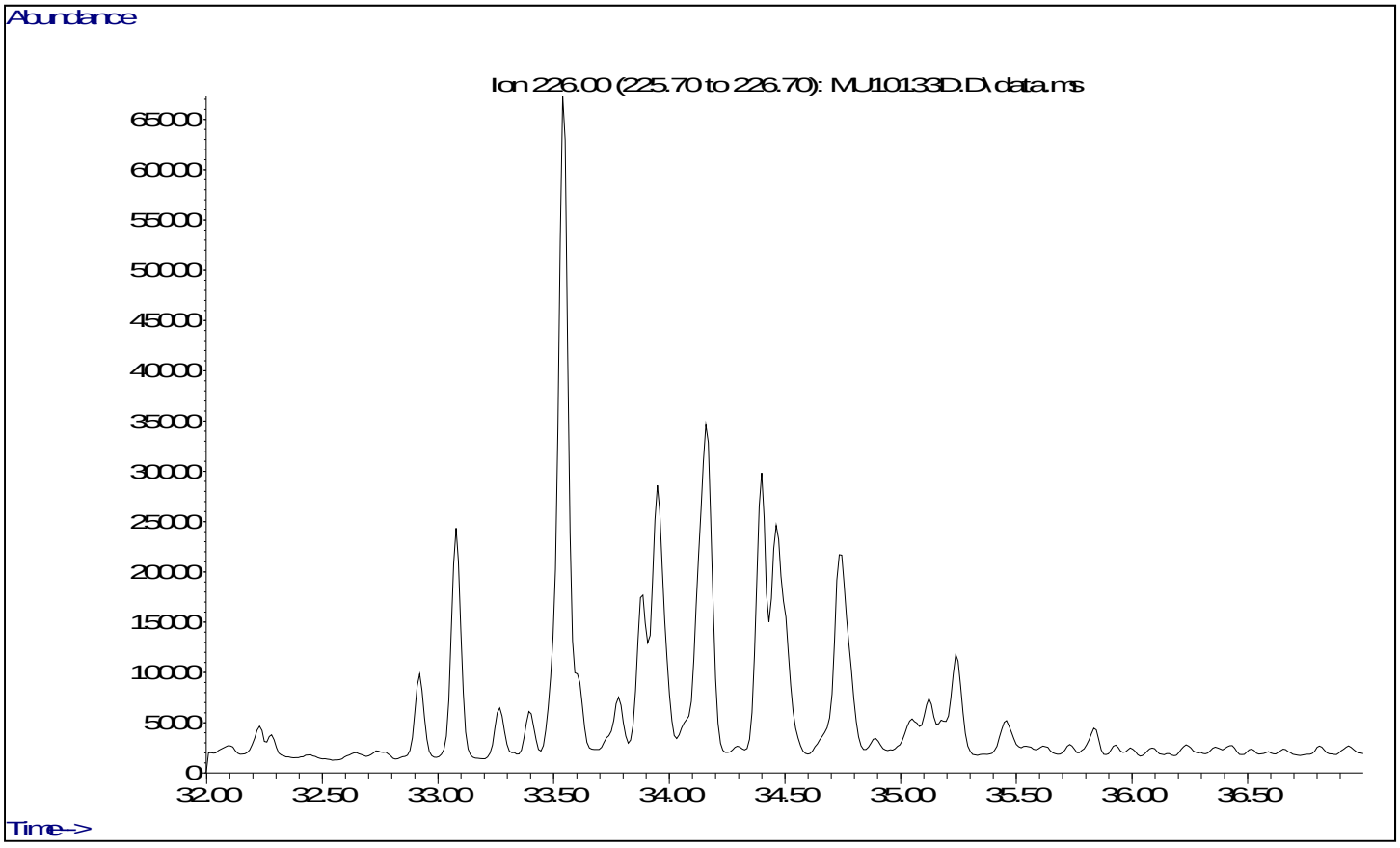
2010133-02 (Source Oil, Pre-spill) – C1-DBTs



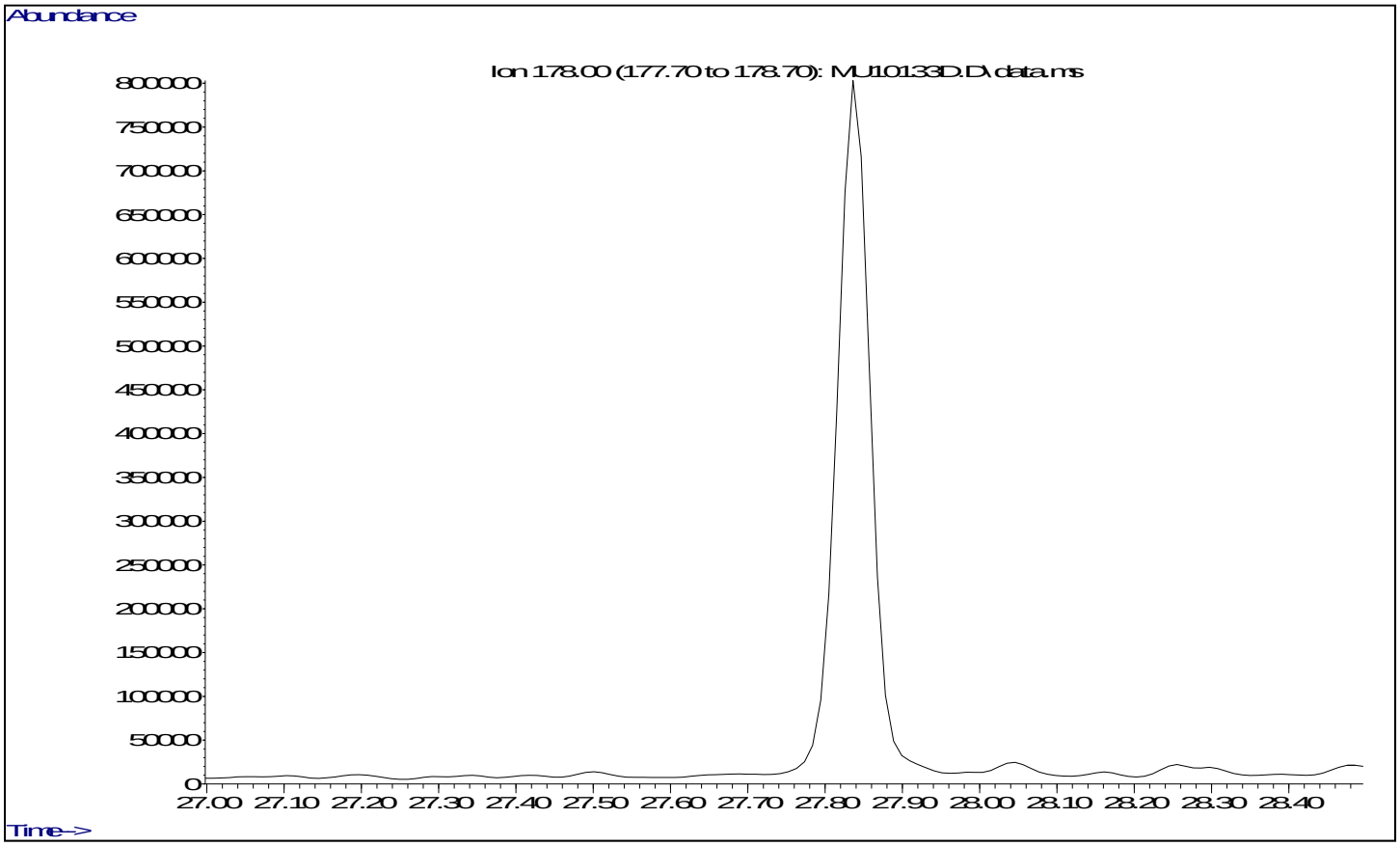
2010133-02 (Source Oil, Pre-spill) – C2-DBTs



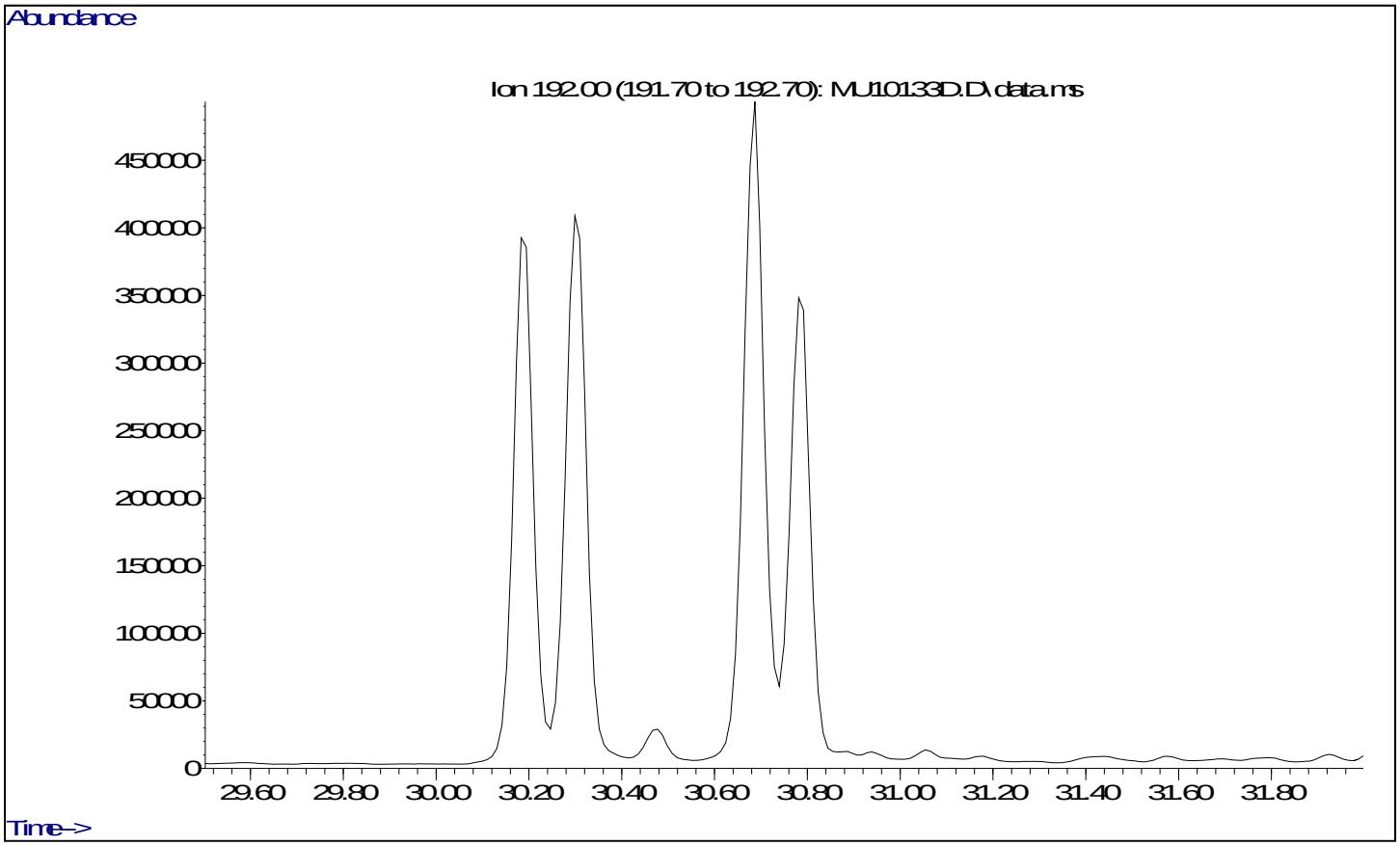
2010133-02 (Source Oil, Pre-spill) – C3-DBTs



2010133-02 (Source Oil, Pre-spill) – Phenanthrene



2010133-02 (Source Oil, Pre-spill) – C1-Phenanthrenes



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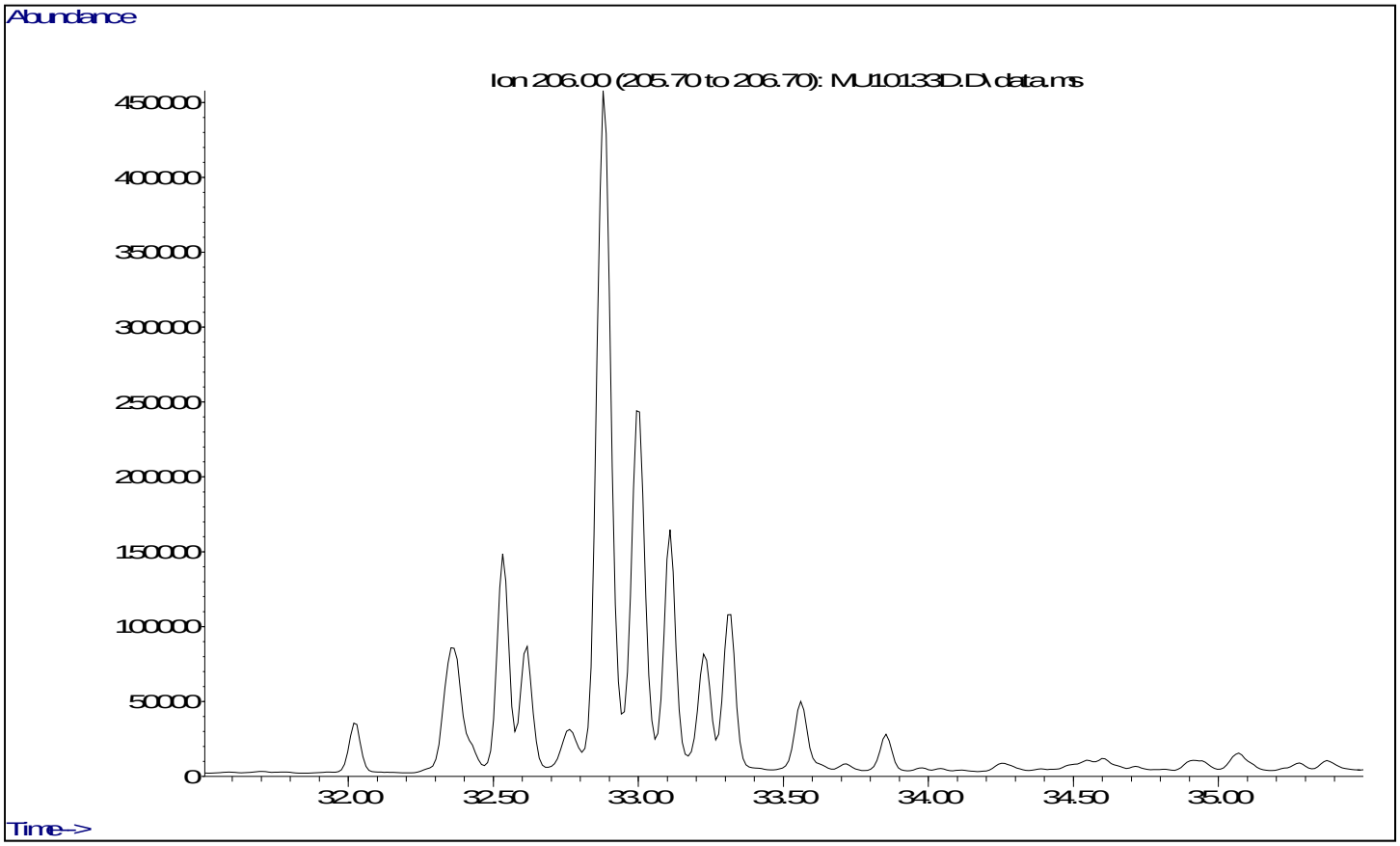
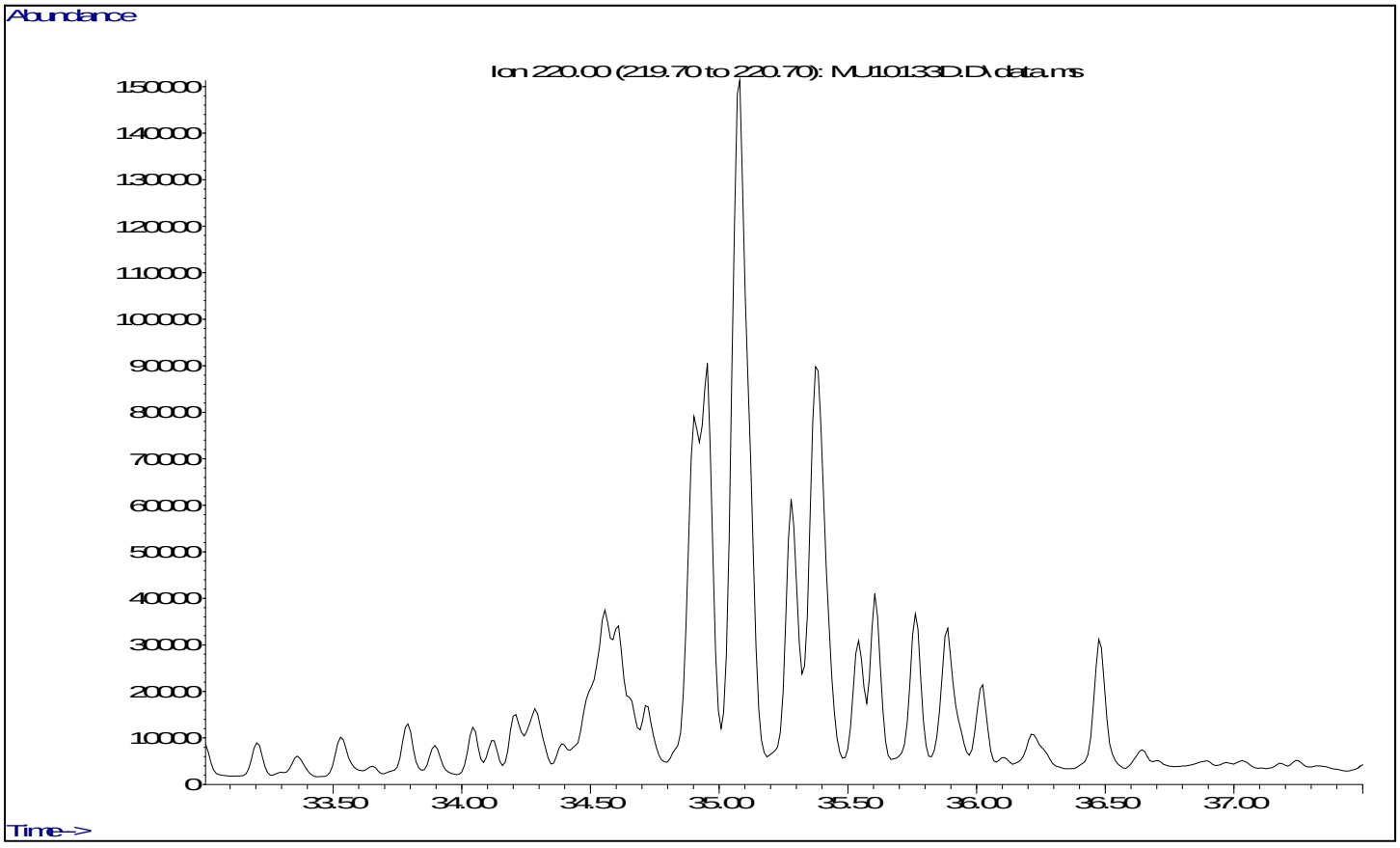
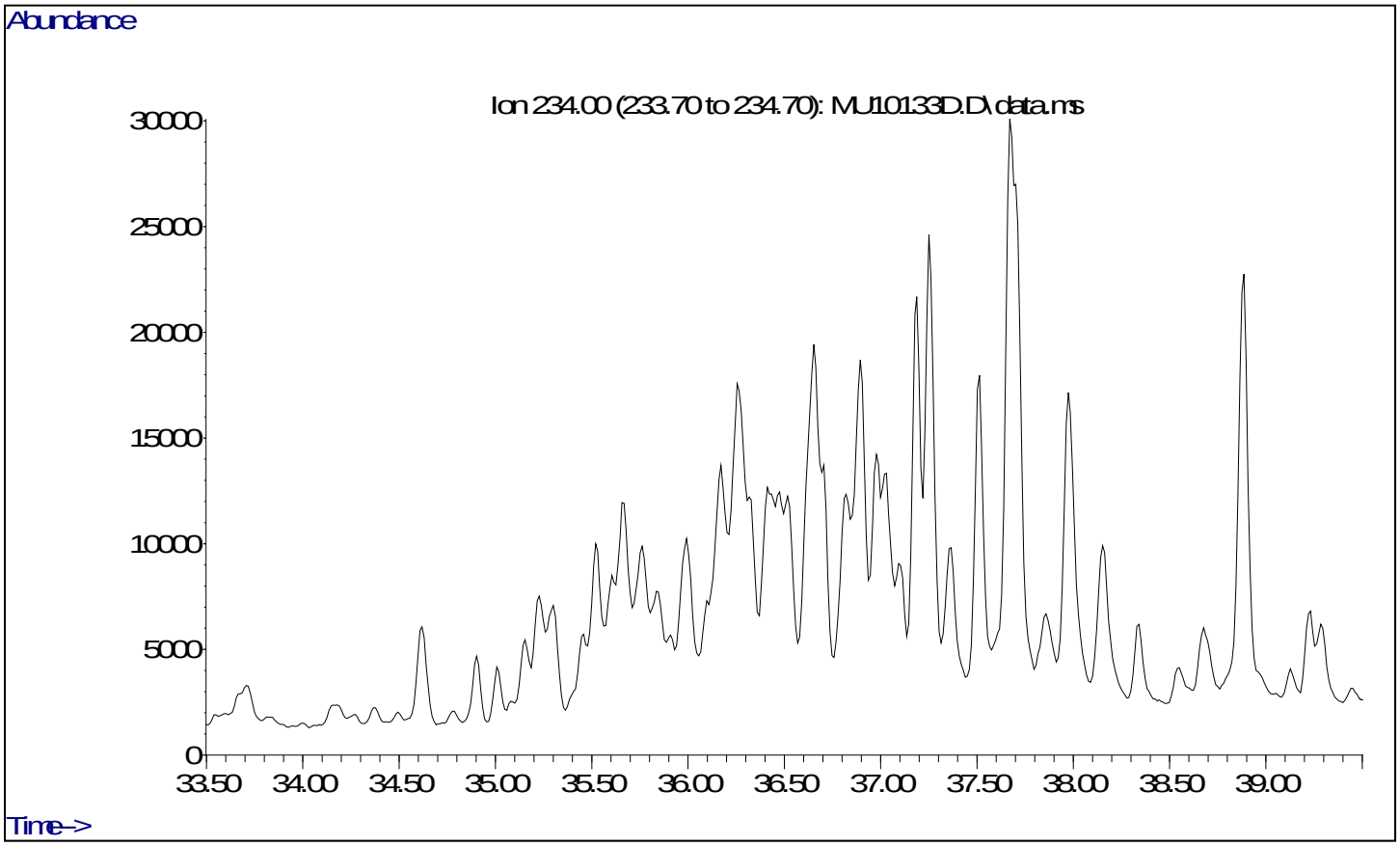


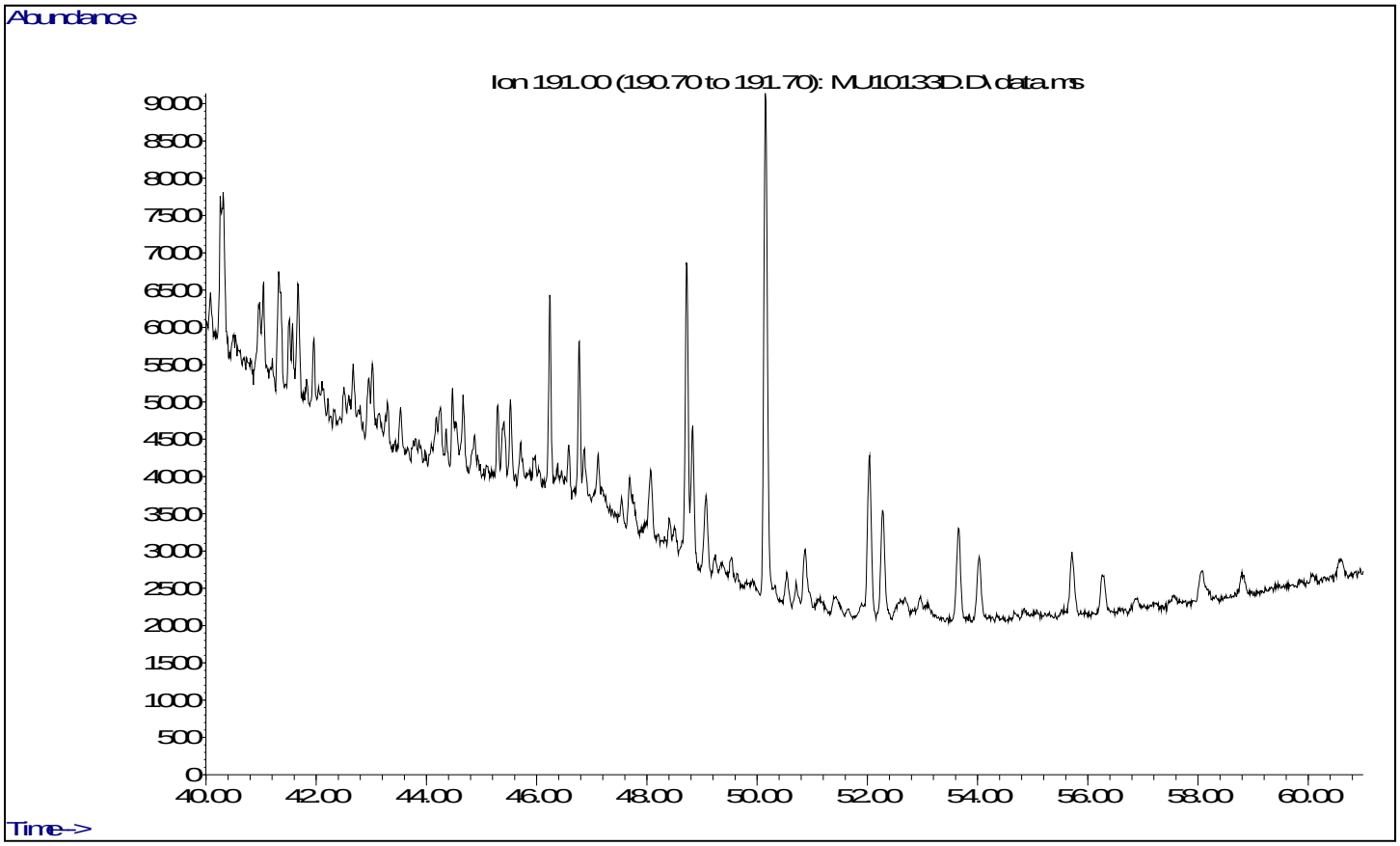
2010133-02 (Source Oil, Pre-spill) – C3-Phenanthrenes



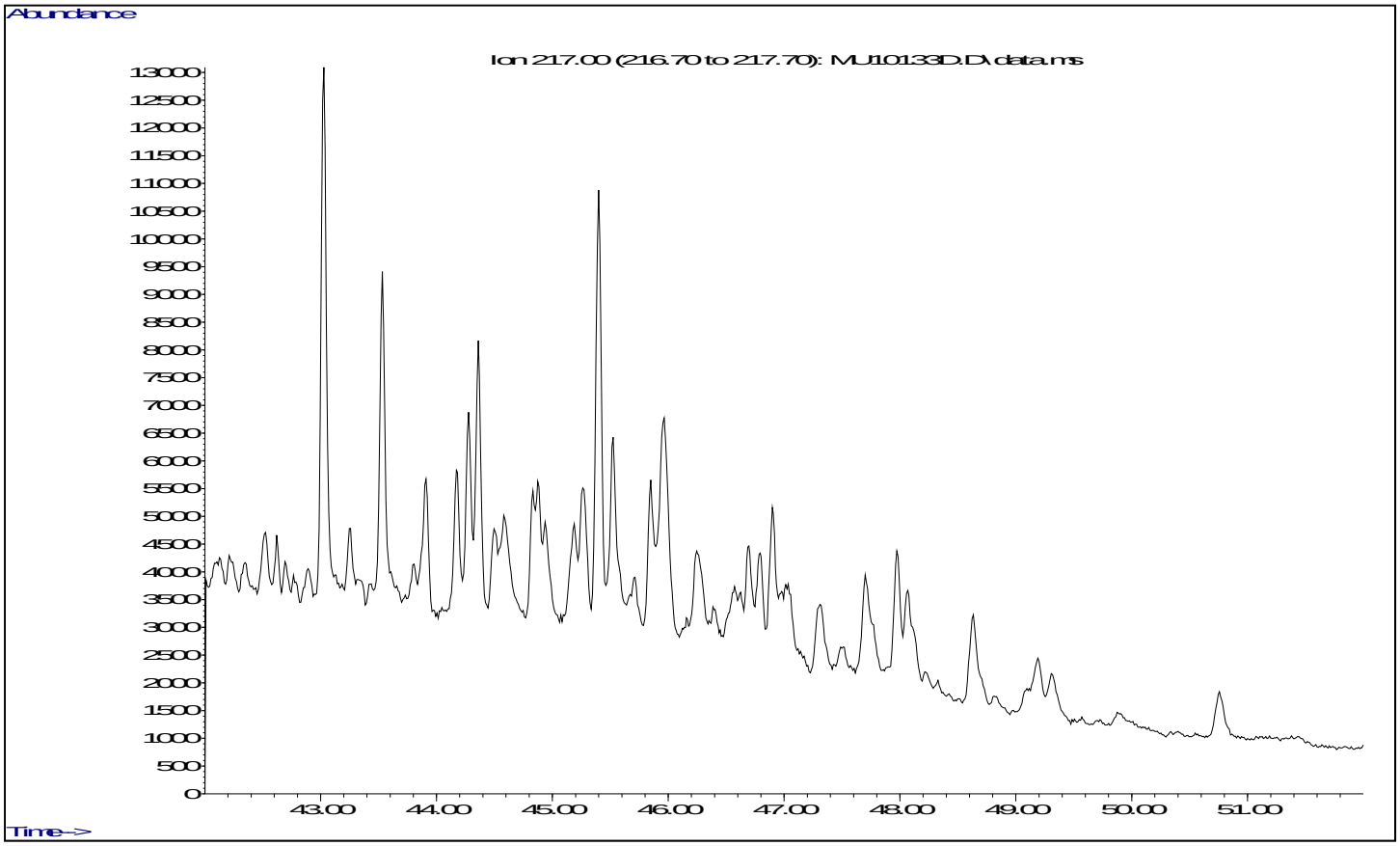
2010133-02 (Source Oil, Pre-spill) – C4-Phenanthrenes



2010133-02 (Source Oil, Pre-spill) – Hopanes



2010133-02 (Source Oil, Pre-spill) – Steranes



APPENDIX G

Welcome

Deepwater Horizon Dispersant Use Meeting

Deepwater Horizon Dispersant Use Meeting

May 26-27, 2010

Nancy E. Kinner
Coastal Response Research Center
(CRRC)
UNH Co-Director

LOGISTICS

- Fire Exits
- Restrooms
- Location of breakout rooms
- Dining - breakfasts, lunches & snacks (outside meeting rooms)
- Evening Dinner:
  - Location: Mike Anderson's (directions on registration desk)
  - Cash bar available (beer and wine) - 6:30 pm
  - Buffet Dinner
- If you have any questions - check with staff at registration table

KEY CRRC STAFF

- Nancy Kinner - UNH Co-Director
- Joseph Cunningham - Research/Group Lead
- Zachary Magdol - Research/Group Lead
- Kathy Mandsager - Program Coordinator
- Heather Ballestero - Graduate Student/Recorder
- Mike Curry - Graduate Student/Recorder
- Tyler Crowe - Graduate Student/Recorder
- Joe Corsello - Undergraduate Student/Recorder
- Eric Doe - Undergraduate Student/Recorder

CRRC OVERVIEW

CRRC CREATION

- NOAA's Office of Response and Restoration (ORR)/UNH spill partnership in 2004
- Co-Directors:
  - UNH - Nancy Kinner
  - NOAA - Amy Merten
- Funding for oil spill research decreasing
  - Government
  - Private sector
- Many research needs exist regarding spill response, recovery and restoration

OVERALL MISSION

- Develop new approaches to response and restoration through research/synthesis of information
- Serve as a resource for ORR, NOAA and other agencies
- Serve as a hub for spill research, development and technical transfer for ALL stakeholders
  - Spill community (U.S. and internationally)

SPECIFIC CENTER MISSIONS

- Conduct and oversee basic and applied Research and outreach on spill response and restoration
- Transform research results into practice
- Educate/train students who will pursue careers in spill response and restoration

OUTREACH EFFORTS

- Workshops on hot topics to identify research priorities and partners
  - Dispersed Oil: Efficacy and Effects
  - Submerged Oil: State of the Practice
  - Human Dimensions of Spills
  - Dispersed Oil Research Forum
  - Integrated Modeling
  - PAH Toxicity
  - Environmental Response Management Application (ERMA®)
  - Environmental Response Data Standards
  - HEA Metrics Workshop
  - Opening the Arctic Seas: Envisioning Disasters & Framing Solutions
  - Oil Spill Research Needs
  - NRDA in Arctic Waters: The Dialogue Begins

CRRC DISPERSANT ACTIVITIES

- May 2005 - NRC Dispersed Oil Report
  - Highlighted need for R&D
- July 2005 - CRRC Hosted Dispersed Oil R&D Meeting
  - Federal & State Agencies, Industry, NGO's
- September 2005 - Dispersed Oil Workshop
  - 52 Participants Representing Cross Section of Stakeholders
  - 2006 R&D Needs Report Released

DISPERSANT R&D NEEDS IDENTIFED

- Chemical parameters that influence overall effectiveness
- Operational and hydrodynamic parameters that influence overall effectiveness
- Modeling integration of chemical, operational, and hydrodynamic parameters
- Fate of oil and dispersed oil in the water column and other habitats
- Realistic exposure regimes/toxicity testing
- Integration to make short and long term prediction of effects

DISPERSANT WORKING GROUP

- Formed to Coordinate Dispersants Research Funding
- ~26 Members - Major Funding Organizations
  - U.S. and International
- Public & Private Sector
  - Governmental Agencies, Industry, NGOs
- ~$8.3M in Dispersant R&D by DWG Members
- CRRC ~$2.4M - Focused on Transport, Behavior and Effects
  - NOAA Interests

DISPERSANTS WORKING GROUP

- Activity/Information on CRRC
  - www.crrc.unh.edu/dwg
- 2006 R&D Report
- 2007 Dispersants Forum Slides
- List of All Dispersants R&D Funded by DWG Members

BACKGROUND FOR TODAY'S MEETING

- CRRC NRDA in Arctic Workshop: April 20-22, 2010
- April 20th DWH Blowout
- Dispersant Use - Large Volume
  - Aerial Sorties
  - Subsurface (5000 ft depth) Injection
- Largest Volume of Dispersants Ever Applied
- Unique Subsurface Injection into Plume at ~5000ft Depth

STAKEHOLDER & PUBLIC CONCERN

- If Top Kill of Well Does Not Work This Week
  - Is Large Scale Aerial and Subsurface Dispersant Use Advisable for Another 2-2.5+ Months While Relief Well Is Completed?
  - What Monitoring Protocols Needed for Long-Term Use?

CRRC ROLE IN TODAY'S DWH DISPERSANT MEETING

- CRRC History With Dispersants R&D
- CRRC Leadership of DWG
- CRRC: Independent and Honest Broker
  - NH not oil-producing state
  - UNH independent academic affiliation
  - Strong record of peer review
  - Known for bringing all stakeholders into discussions

DWH DISPERSANT USE MEETING

- First Suggested Few Weeks Ago
- Should Be in a Gulf State
- Representatives of All Stakeholders
- Short Time Frame
- Final Clearance to go Forward = Saturday, May 20
  - ~96 hr Ago!!!!!!

PLANNING COMMITTEE

Carl Childs, NOAA ORR
Tom Coo baugh, ExxonMobil
Dave Fritz, BP
Kurt Hansen, USCG, R&D Center
Charlie Henry, NOAA SSC
Bruce Hollebone, Environment Canada
Nanc_ Kinner_ CRRC
Ken Lee, Fisheries & Ocean, Canada
Alan Mearns, NOAA ORR
Joe Mullin, MMS
Bob Pond, USCG HQ
Nat Scholz, NOAA,NMFS
Al Venosa, EPA

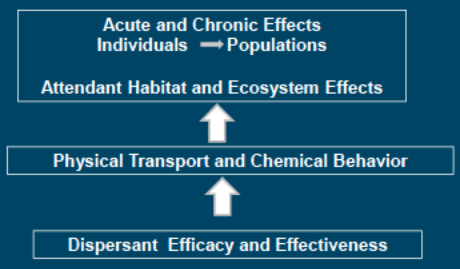
NATURAL RESOURCE FOCUS OF SPILL RESPONSE

- Minimize Damage to Natural Resources
- Focus on Individuals, Populations, Habitats, Ecosystems
- Question of Acute and Chronic Effects
- Therefore Need to Know Exposure Pathways
- Need to Know Contaminant Concentrations Biota Exposed to and Exposure Duration

CONCENTRATION AND TIME

- Based on Physical Transport and Chemical Behavior
  - Which is Based on Dispersant Efficacy and Effectiveness

FRAMEWORK OF DISCUSSION



MEETING GOALS

- Bring Together Experts on Biological Effects, Physical Transport and Chemical Behavior, and Dispersant Efficacy and Effectiveness
  - Scientists, Engineers, Practitioners
- Goal to Inform RRTs as They Make Decisions about When, Where and How to Use Dispersants in DWH Incident

MEETING GOALS

- Provide input to the Region 4 and Region 6 Regional Response Teams (RRT) on the use of dispersants going forward in DWH Incident
  - Also for Future Spill Responses
- Identify possible monitoring protocols in the event of continuing aerial and subsurface dispersant application

MEETING STRUCTURE

- Wednesday AM plenary session overviews
  - 1:15 Breakout Session I
  - 3:15 Break
  - 4:15 Plenary Session: Group Reports
  - 5:15 Wrap-Up
  - 5:30 Adjourn
- Thursday
  - 8:00 Continental Breakfast
  - 8:20 Overview and Review/Recalibrate
  - 8:30 Breakout Session II
  - 10:00 Break (as necessary)
  - 11:15 Plenary Session: Breakout Group Reports
  - 12:15 Lunch
  - 1:00 Plenary Session: Development of Recommendations and Protocols for RRTs and Next Steps
  - 4:30 Adjourn

MEETING STRUCTURE

- **Breakout Groups- Wednesday PM and Thurs AM**
  - *Group A: Dispersant efficacy and effectiveness* **Leader: Joe Cunningham, CRRC**
  - *Group B: Physical Transport/ Chemical Behavior of dispersed oil* **Leader: Bruce Hollebone, Environment Canada**
  - *Group C: Biological effects of dispersants on species with commercial interest* **Leader: Zach Magdol, CRRC**
  - *Group D: Biological effects of dispersants on non commercial species*

MEETING STRUCTURE

- **Wednesday AM Breakout Questions**
  - What do we need to know in order to give input regarding dispersant operations and to identify possible monitoring protocols?
  - What is the current state of knowledge regarding the DWH spill?
  - What are the gaps in our knowledge or information?
    - Can these gaps be addressed using information from past experience and/or the literature?
    - If not, what information should be collected in the short and long term?

Meeting Structure

- **Thursday AM Breakout questions**
  - Develop input for RRTs on aerial and subsurface dispersant use if the DWH release continues
    - What are the tradeoffs (risks/benefits) associated with this input?
  - Identify possible monitoring protocols in the event of continuing dispersant use.

MEETING STRUCTURE

- **Thursday PM- Plenary Session**
  - **Consensus on input to RRTs**
    - **Noting all views in discussion**
  - **Consensus on monitoring protocols**
    - **Noting all views in discussion**
  - **Next steps including R&D needs**
    - **Noting all views in discussion**

CRRC MEETING REPORT

- Report with input on use of dispersants going forward and suggested monitoring protocols
- Report contents include:
  - Participant list
  - Recorders notes
  - Group report out presentations
  - Plenary slide presentations

MEETING IS NOT MEDIA EVENT

- Dispersant use is "hot" media topic
- Meeting of Best Expertise on Inform RRTs as They Continue to Make Decisions about Dispersant Use
- Meeting only open to participants
  - Working meeting
  - Not public forum on dispersant use

"CIVIL" DISCUSSION

- LISTEN, LISTEN, LISTEN
- Speak forthrightly, not dismissively
- Be sure everyone gets heard
- Use language carefully and precisely
- Work hard, Stay loose

FINAL GUIDANCE

- We must give input to RRTs regarding dispersant use going forward
- Real world situation
  - Not table top exercise
- RRTs must make decision on if and how to continue dispersant use if "top kill" does not work
- Decision even if field and lab data are not conclusive

QUESTIONS ABOUT AND DISCUSSION OF MEETING FORMAT AND GOALS?

Coastal Response Research Center Website

www.crrc.unh.edu

PARTICIPANT INTRODUCTIONS

- Name
- Affiliation
- Expertise

GOOD MORNING!

Deepwater Horizon Dispersant Use Meeting Day 2

BREAKOUT GROUPS

- *Group A1: Dispersant efficacy and effectiveness : Deep Ocean* **Leader: Joe Cunningham, CRRC**
- *Group A2: Dispersant efficacy and effectiveness : Surface* **Leader: Nancy Kinner, CRRC**
- *Grou B: Ph sical Trans ort/ Chemical Behavior of dispersed oil* **Leader: Bruce Hollebone, Environment Canada**
- *Group C: Biological effects of dispersants Deep Ocean* **Leader: Zach Magdol, CRRC**
- *Group D: Biological effects of dispersants: Surface Water Group Leader Nichole Rutherford, NOAA*

EFFICACY AND EFFECTS

- **Surface BIG ROOM**
  - Tom Coolbaugh
  - J.T. Ewing
  - Chantal Guenette
  - Ann Hayward Walker
  - Ed Levine
  - Joe Mullin
  - Duane Newell
  - Kelly Reynolds
- **Deep Ocean**
  - Craig Carroll
  - Per Daling
  - Ben Fieldhouse
  - Lek Kadeli
  - Paul Kepkay
  - Zhengkai Li
  - Bob Pond
  - Al Venosa

MEETING GOALS

- Provide input to the Region 4 and Region 6 Regional Response Teams (RRT) on the use of dispersants going forward in DWH Incident
  - Also for Future Spill Responses
- Identify possible monitoring protocols in the event of continuing aerial and subsurface dispersant application

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- Decision even if field and lab data are not conclusive

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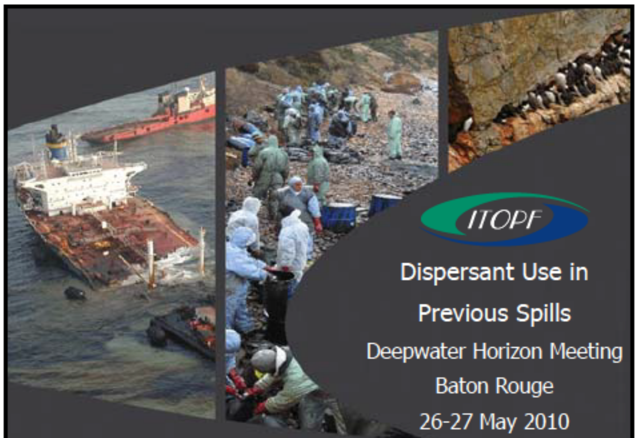
  - 4:30 Adjourn

Meeting Structure

- Thursday AM Breakout questions
  - Develop input for RRTs on aerial and subsurface dispersant use if the DWH release continues
    - What are the tradeoffs (risks/benefits) associated with this input?
  - Identify possible monitoring protocols in the event of continuing dispersant use.

QUESTIONS ABOUT AND DISCUSSION OF MEETING FORMAT AND GOALS?



Dispersant Use in Previous Spills

Deepwater Horizon Meeting

Baton Rouge

26-27 May 2010

INTRODUCTION TO ITOPF

- Established in 1968 after Torrey Canyon to administer TOVALOP
- Specialised technical advisory role began in early 1970's
- Main role is to provide advice on marine spills of oil & chemicals
- Primarily maintained by shipping industry & their P&I Insurers
- Operates as a non-profit making organisation
- Based in London but provides a global service

Role of ITOPF

ITOPF RESOURCES

- Collectively more than a century of hands-on experience of spills
- Attendance at over 600 incidents in 90 countries since 1972
- Worldwide network of contacts built over 40 years of history
- Comprehensive technical library and databases on oil & chemical spills
- 25 staff with 13 technical advisers on call 24 hrs a day

Role of ITOPF

RECENT INCIDENTS ATTENDED (JAN 09 – MAY 10)

Date of Incident	Vessel	Tanker	Location	Country	Spi l type	Estimated Amount spilled
28/01/2009	ASSALAMA	N	a faya	Mo occo	None	None
13/02/2009	DUNLIN ARROW	N	ouched Bottom	Dom n can Republ c	IFO 380	40 m³
20/02/2009	MARINE STAR	N	ff Saka de,	Japan	HFO	3 5 - 6 m³
11/03/2009	PACIFIC ADVENTURER	N	sbane	Aust al a	IFO 380, Ammon um N t ate	230 - 270 m³ 31 Conta ne s
20/06/2009	ISOLA VERDE	Y	zm	Tu key	Fuel o l M-100	10 m³
27/06/2009	MARTI PRINCESS	N	Off Island Bozcaada	Tu key	None	None
14/07/2009	YM INCEPTION	N	o t Sa d	Egypt	Bunke	6 8 m³
31/07/2009	FULL CITY	N	angesund	No way	IFO 180	200 m³
07/08/2009	W-O BUDMO	Y	Heng Chun	Ta wan	None	None
08/08/2009	XIN DONG GUAN 3	N	oho Bah u	Malays a	IFO 380	10 m³
26/08/2009	GULSER ANA	N	aux Cap	Madagasca	IFO 180, Rock Phosphate	600 m³, unknown
27/08/2009	CABO PILAR	Y	Mad e De Deus	B az l	IFO 380	50 m³?
15/09/2009	AGIOS DIMITRIOS	N	Gaolan Do	Ch na	IFO 380	50 m³
02/10/2009	MV RED ROSE	N	o t of Dunk k	F ance	IFO 380	20 m³
23/10/2009	MV MARSTAN	N	o t of Hambu g	Ge many	IFO 180	8 m³
24/10/2009	LOWLANDS PROSPERITY	N	aofe d an	Ch na	HFO	126 m³
28/10/2009	MSC SHENZHEN	N	Algec as	Spa n	IFO 380	280 m³
01/11/2009	ZOORIK	N	uhuashan,	Ch na	IFO 180	500 m³
05/12/2009	AFFLATUS	N	We ha	Ch na	IFO 380	Unknown
31/12/2009	SAMHO HERON	N	Off Imaba a	Japan	Lube Base O l S-96	300 m³
05/01/2010	FURNESS MELBOURNE	N	l Jad da	Mo occo	None	None
12/01/2010	HUASCO	N	A ca	Ch le	IFO 180	4-5 m³
24/01/2010	EAGLE OTOME	Y	o t A thu	USA	Olmeca C ude-Sou	1400 m³
26/01/2010	SEA ANGEL	N	enghu Island,	Ta wan	Bunke	Unknown
19/02/2010	CMA CGM STRAUSS	N	Genoa	taly	HFO 500	180 m³
[illegible]	[illegible]	N	[illegible]	[illegible]	IFO 180	[illegible]

SPILLS INVOLVING THE USE OF DISPERSANTS (1995 – Present)

Date	Vessel	Location	Oil type	Approx. Spill Volume	Air/Vessel Application	Conditions
10/07/1995	IRON BARON	Australia	HFO	450te	?	winter
22/07/1995	SEA PRINCE	S Korea	mixed Arabian crude oils	1 400te	A	Strong shoreward winds
03/08/1995	YEO M NG	S Korea	HFO	40te	?	
17/11/1995	HONAM SAPPHIRE	S Korea	Arabian Heavy crude	5 000te	Both	n berth
15/02/1996	SEA EMPRESS	UK	Forties Crude	76 000te	A	Entrance to dock
25/03/1996	LIVERPOOL BAY	Saudi Arabia	HFO	257te	V	outside port
09/08/1996	KRITI SEA	Greece	Arabian Light Crude	20-30te	V	
02/12/1996	TAIYOUNG JASMIN	S Korea	HFO marine diesel & lube	<150te	V	50m deep
02/01/1997	NAKHODKA	apan	FO 180	5 200 - 8 000te	A	200m from shore bow section)
08/02/1997	SAN JORGE	Uruguay	Canadon Seco crude	5 000te	Both	19 miles from shore Grounded
03/04/1997	OSUNG NO.3	Rep. of Korea	HFO	1 700te on board	V	70m deep
02/07/1997	DIAMOND GRACE	apan	3mm Shelf (Abu Dhab) ligh	500te	V	n bay and port
07/08/1997	KATJA	France	HFO	190te	V	n port reaching beaches & marina
17/08/1997	MUTIARA	ndonesia	Sangatta crude	40-150te	V	
15/10/1997	EVOIKOS	Singapore	HFO		?	Tropical 20-50m dee
18/09/1998	PRINCESS OF THE ORIENT	Philippines	Fuel oil (mostly HFO)	500te on baord	?	
15/10/1998	CHUN IL	apan	Diesel and HFO	15te of each	?	Grounding
22/07/1999	MARY ANNE	Philippines	FO	71 te	V	57m deep

PREVIOUS DISPERSANT USE

SPILLS INVOLVING THE USE OF DISPERSANTS (1995 – present)

Date	Vessel	Location	Oil type	Approx. Spill Volume	Air/Vessel application	Conditions
24/07/1999	Irish Sea	Chile	IFO	40-100te	V	cold
24/0 /2000	AL JAZIAH	UAE	Fuel oil (?)	100-200te	?	Nr port 5m deep
22/06/2000	TREASURE	S Africa	fuel and lube o ls	200te	V	
29/08/2000	NORDLAND	Greece	IFO 180	110te	?	
0 /10/2000	NATUNA SEA	Singapore	Nile Blend crude	7 000te	Both	
20/12/2000	RANDGRID	UK	Heldrun crude	12-15te	V	
10/07/2001	LUC NAM	India	IFO 80 marine diesel & lube	<100te	V	Warm water
15/0 /2002	EASTERN FORTITUDE	Thailand	IFO180	260te	V	
3 /0 /2002	AI GE	Japan	Heavy Bunker o l and LFO	115te	V	Cold 12 miles out open water
3 /0 /2002	AGATE	Singapore	Waxy Indonesian Crude	128te	?	Cold
12/06/2002	NEPTANK V I	Singapore	IFO 380	300te	V	
2 /1 /2002	TASMAN SEA	China	Brunei Crude Oil (light volat le)	160-350te	V	Warm moderate winds 25m deep
27/07/2003	TASMAN SPIRIT	Pakistan	Iranian cude	30 000te	A	Near port
04/08/2003	ALMA ATA	Colombia	Coal and HFO 380	168te	Both	warm
22/02/2004	LONDON EXPRESS	Japan	IFO 380 bunkers	10te	V	In container berth
14/12/2004	AL SAMIDOON	Suez Canal	Kuwait medium crude	9000te	?	
07/04/2005	RATNA SHALINI	Kenya	Murban crude	150- 80te	V	
08/04/2005	GG-CHEMIST	China	Diesel(MDO) oil (bunkers)	unknown	V	190km from Shanghai

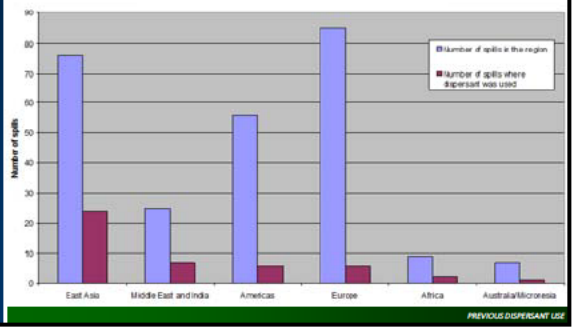
PREVIOUS DISPERSANT USE

SPILLS INVOLVING THE USE OF DISPERSANTS (1995 – Present)

Date	Vessel	Location	Oil type	Approx. spill Volume	Air/Vessel application	Conditions
20/04/2005	SAETTA	Colombia	HFO (IFO 380)	27te	Both	
23/05/2005	ASTRO LUPUS	Iran	Kuwait Export Crude	560te	V	14-18nm from shore
22/09/2005	JUB LEE GLORY	China	IFO380/diesel oil	950m3 oily water	V	shallow brackish water
31/10/2005	E DER	Chile	HFO (IFO 180)	<200m3	V	deep (continental shelf) near shore
13/04/2006	EASTERN CHALLENGER	Japan	IFO180		V	
04/2006	TITAN MERCURY	Saudi Arabia	Arabian Heavy Crude	50-300 m3	Both	
30/05/2006	OCEAN SERAYA	India	HFO	390te	?	
11/08/2006	SOLAR 1	Philippines	IFO	2000te	?	
20/01/2007	MSC NAPOLI	UK	Fuel Oil		V	
07/12/2007	HEBEI SPIRIT	South Korea	Crude	10500te	A	
14/07/2009	YM INCEPTION	Egypt	HFO	7te	V	In canal
15/09/2009	AGIOS DIMITRIOS	China	IFO 380	50te	V	
24/10/2009	LOWLANDS PROSPERITY	China	HFO	120te	V	
01/11/2009	ZODIAK	China	IFO 180	500te	V	
05/12/2009	AFFLATUS	China	IFO 380	Unknown	V	

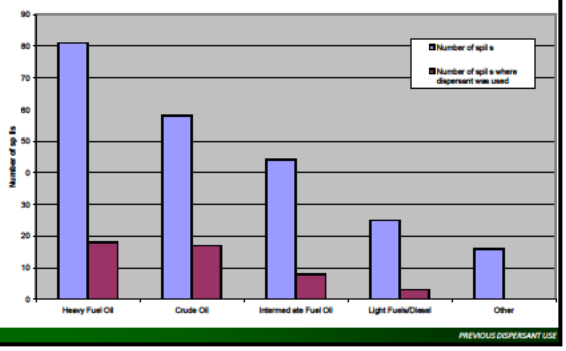
PREVIOUS DISPERSANT USE

REGIONAL DISTRIBUTION OF SPILLS AND DISPERSANT USE (1995 – 2005)



PREVIOUS DISPERSANT USE

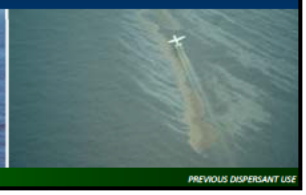
OIL TYPE DISTRIBUTION OF SPILLS AND DISPERSANT USE (1995 – 2005)



PREVIOUS DISPERSANT USE

SEA EMPRESS 1996

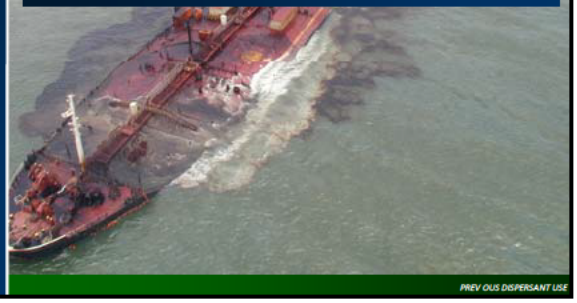
- SEA EMPRESS, Milford Haven (1996) – 72,000 tonnes Forties crude spilled
- Estimated 40% evaporation, 52% natural + chemical dispersion, 1-2% at-sea recovery
- Dispersant spraying reduced shoreline impact by an estimated 17,000 tonnes of oil



PREVIOUS DISPERSANT USE

TASMAN SPIRIT

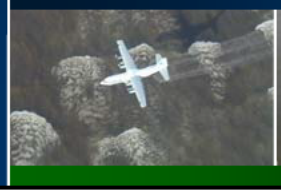
- Oil tanker loaded with 87,584 te of Iranian Light Crude Oil grounded at the entrance to Karachi Port on 27th July 2003
- Hull subject to stress from heavy swell due to south west monsoon. Cargo tanks ruptured but bunker tanks remained in tact
- Approx. 30,000 te of cargo lost, remainder (& 440 te of HFO) successfully offloaded



PREV OUS DISPERSANT USE

TASMAN SPIRIT

- Oil dispersing naturally into the water column
- Nearshore dispersant application as a result of NEBA – concerns over Indus Delta
- C 130 Hercules mobilised from OSR Singapore



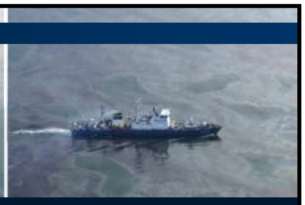
PREVIOUS DISPERSANT USE

HEBEI SPIRIT (7 DEC 2007)

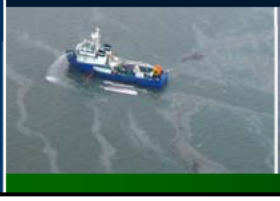
- Fully laden (264,000 MT) VLCC at anchor off Taean struck by drifting crane barge
- 3 port-side tanks damaged - 10,800 MT spill (Kuwaiti Export Iranian Heavy & Upper Zakum)
- ITOPF on site by 8th Dec at request of Skuld P&I & IOPC Fund

PREV OUS DISPERSANT USE

AT-SEA RESPONSE



- Korea Coast Guard + KMPRC (>100 vessels involved)
- Containment & recovery + dispersant + sorbents (>1,500 fishing boats)
- At-sea operations complete by 27th December (20 days post-spill)



PREVIOUS DISPERSANT USE

LARGE-SCALE DISPERSANT APPLICATION

- ITOPF advised use of OSRL-EARL C130 with ADDS Pack in early stages
- Rejected by authorities initially and then accepted after one week
- Window of Opportunity passed – oil too weathered & most stranded

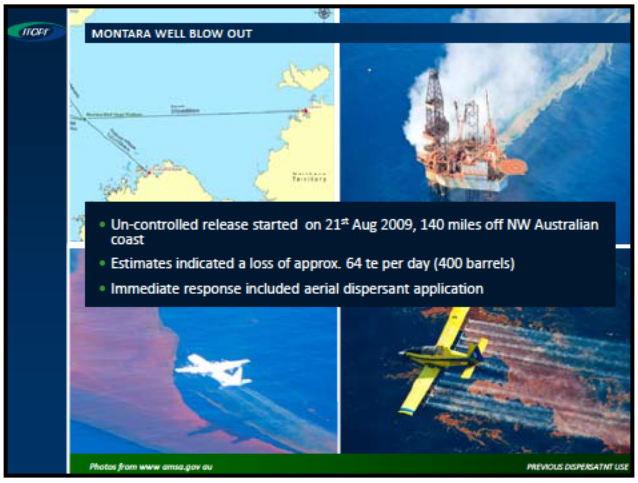
PREVIOUS DISPERSATNT USE

MALIPO BEACH

PREVIOUS D SPERSATNT USE


ITOPF
NATUNA SEA
Grounded in Singapore Straits, lost 7,000 te of Nile Blend Crude oil
Initial aerial application of dispersant, with political pressure for further sorties
Oil properties and weather conditions meant dispersants weren t effective
PREVIOUS DISPERSATNT USE


ITOPF
RECENT ITOPF EXPERIENCE OF DISPERSANT APPLICATION
PREVIOUS D SPERSATNT USE


ITOPF
MONTARA WELL BLOW OUT
Un-controlled release started on 21st Aug 2009, 140 miles off NW Australian coast
Estimates indicated a loss of approx. 64 te per day (400 barrels)
Immediate response included aerial dispersant application
Photos from www.amsa.gov.au
PREVIOUS DISPERSATNT USE


ITOPF
www.itopf.com

Dispersant Monitoring and Assessment for Subsurface Dispersant Application

Kenneth Lee, Zhengkai Li and Paul Kepkay
Centre for Offshore Oil, Gas and Energy Research (COOGER)
Fisheries and Oceans Canada

Plume Monitoring and Assessment for Subsurface Dispersant Application (US EPA Directive – May 10, 2010)

PART 1: "Proof of Concept" to determine if subsurface dispersant operation is chemically dispersing the oil plume.

Following review by the RRT….

PART 2: Robust sampling to detect and delineate the dispersed plume based on the results of PART 1 and input from hydrodynamic modeling

All data provided to the United States Coast Guard (USCG)Federal On-Scene Coordinator, and the Environmental Protection Agency (EPA) Regional Response Team (RRT)

PART 1 – Proof of Concept

- Towed Fluorometer at 1 meter
- **LISST Particle Analysis at 3.5m depth transects and at various depths from surface down to 550 meters**
- Dissolved Oxygen at various intervals from surface to 550 meters
- CTD – Conductivity, Temperature, and Depth at various intervals from surface to 550 meters
- Water sampling from surface to 550 meters for PAH analysis
- Aerial Visual Observation

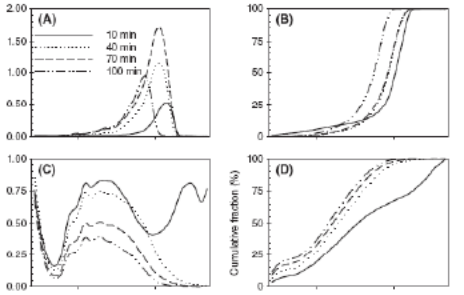
R/V Brooks McCall

PART 2 – Characterization Plan

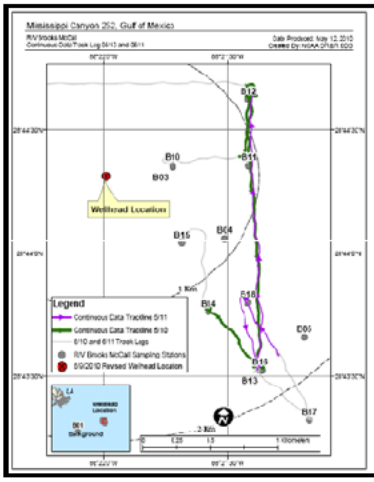
(Ongoing on R/V Brooks McCall and R/V Ocean Veritas

- **UV-Fluorometer casts – surface to sea floor**
- Implementation of the Special Monitoring of Applied Response Technologies ("SMART") Protocol
- **LISST Particle Analysis at various depths from surface to sea floor**
- Dissolved Oxygen, CTD (Conductivity, Temperature, and Depth) at various intervals from surface to sea floor
- Water sampling for PAH analysis
- Aerial Visual Observation
- Rototox toxicity testing
- **2D UV-Fluorescence testing to distinguish chemical vs. physical oil dispersion**

Oil Droplet Size Distributions under Regular Waves: LISST-100X



- Physical dispersion created mono-modal lognormal droplet size distributions
- Corexit 9500 formed multimodal lognormal size distribution
  - A larger number of small droplets and a wider range of size distribution

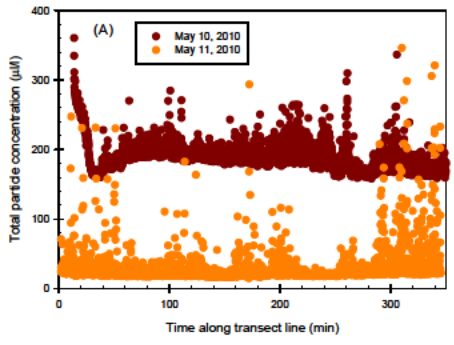


Deployment of LISST-100X at 3.5 m depth

Transect lines on May 10 and May 11, 2010 following subsurface injection of chemical dispersants

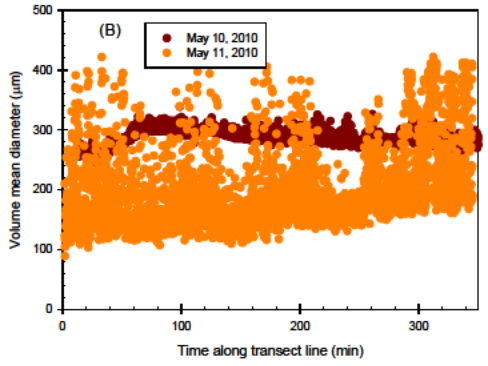
Total Oil Particle Concentration

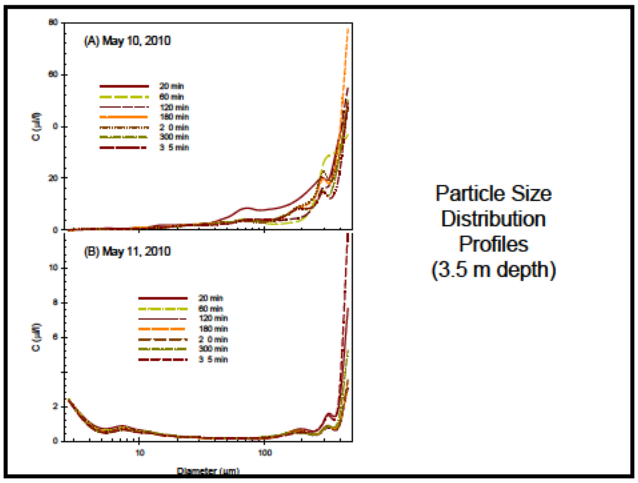
3.5 m depth LISST-100X transect lines



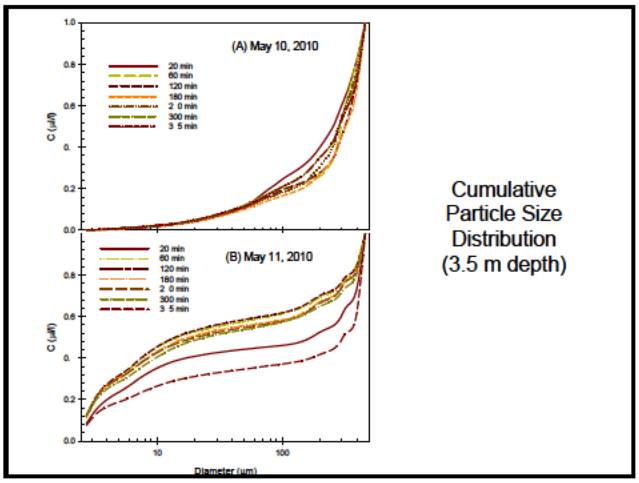
Volume Mean Diameter of Dispersed Oil

3.5 m depth LISST-100X transect lines

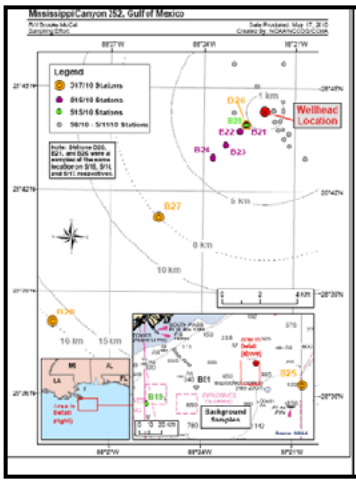




Particle Size Distribution Profiles (3.5 m depth)

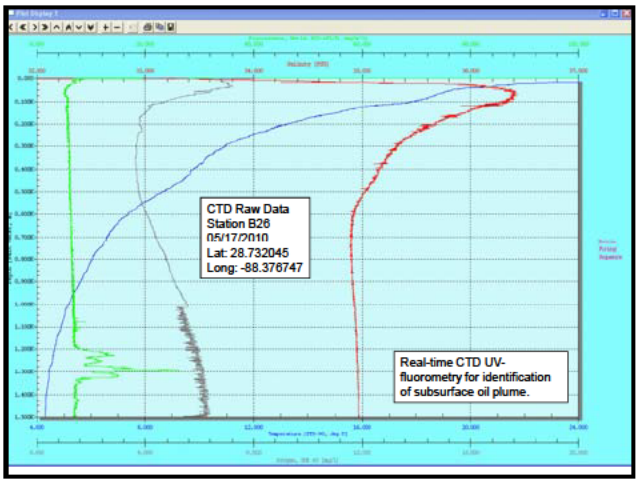


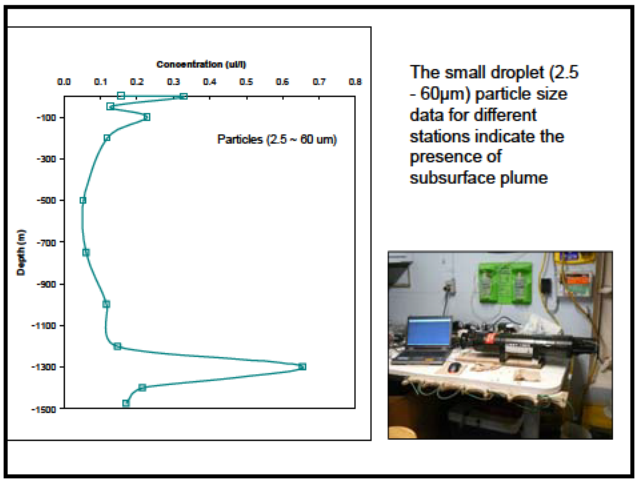
Cumulative Particle Size Distribution (3.5 m depth)



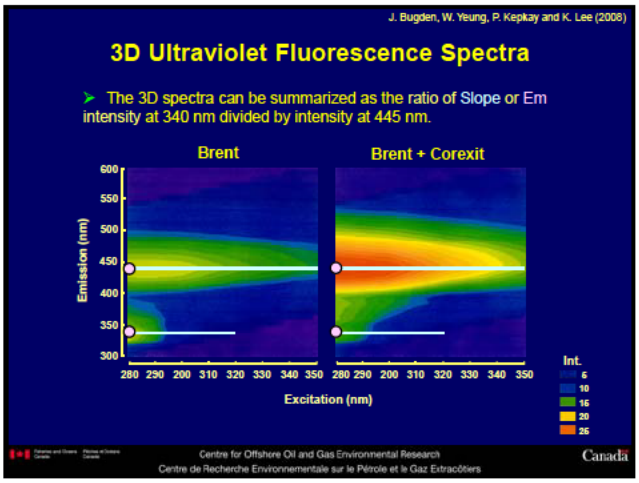
LISST-100X particle size, UV-fluorometry and GC/MS analysis of discrete water samples recovered by Niskin bottle casts

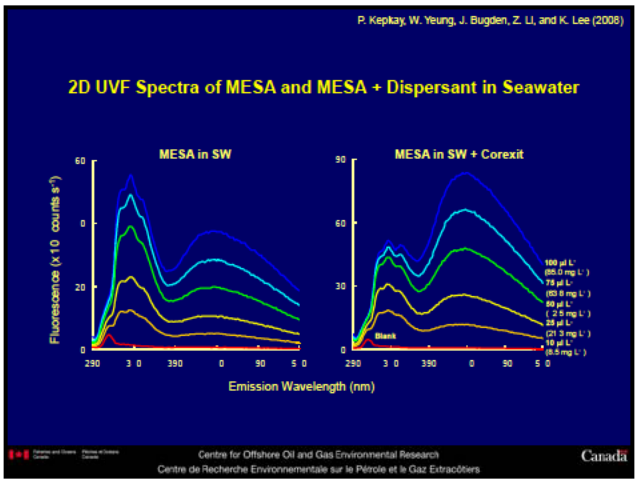
Depth profiles (surface to 1450m) from May 8 to 17, 2010

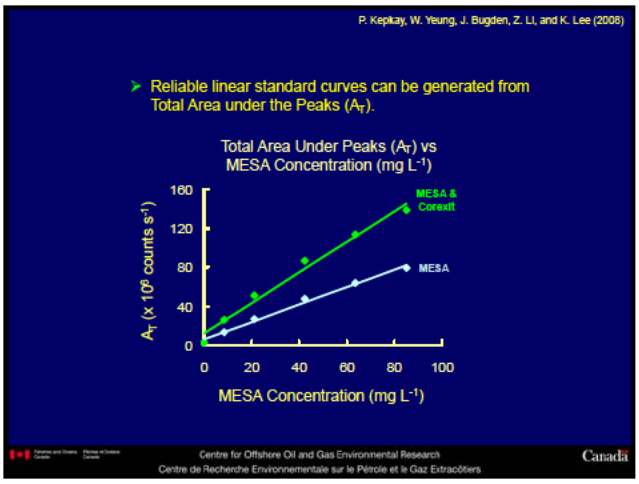


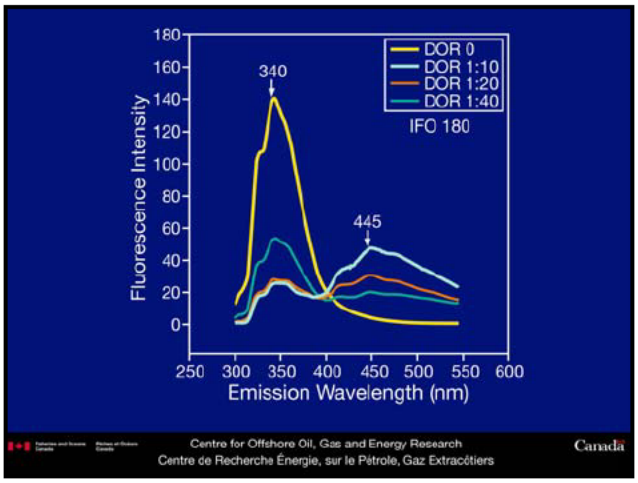


The small droplet (2.5 - 60μm) particle size data for different stations indicate the presence of subsurface plume









How Can Data-Rich 3D UVF (EEM) Spectra be Applied to the Dispersion of Oil Spills ?

- The simplification of a 3D spectrum to 2 measured emission intensities means that a technique can be developed which is based on a ratio (eg, $I_{340/445}$).
- This idea of following oil dispersion using a Fluorescence Intensity Ratio (FIR) is particularly important because the concentration of oil does not have to be measured.
- However, the ratio has to be compared to dispersion efficiencies established under standard conditions (where dispersion efficiency is the oil dispersed divided by the oil added (spilled).

Centre for Offshore Oil and Gas Environmental Research
Centre de Recherche Environnementale sur le Pétrole et le Gaz Extracôtiers
Canada