APPENDIX A
EXAMPLE NEWSLETTERS

OFFSHORE PERSPECTIVES:
THE ENVIRONMENT AND PLATFORM ENGINEERING

OffShore Perspectives

Volume 2 December 2006

Public Comment and Official Responses: The Environment and Platform Engineering

This is the first of three worksheets that present public comments and official federal agency responses from Environmental Impact Statements (EIS) developed for lease sales in the Beaufort Sea just off the Alaskan North Slope. During the EIS process, the public is invited to share concerns and issues, which are then addressed as part of the final document. This publication offers selected public comments and agency responses that touch on recurring themes, present the highest degree of community concern, or are key to understanding how the federal government deals with offshore lease sales and their subsequent results.

Introduction

One of the enduring concerns of many stakeholders is the potential for an oil platform to malfunction, resulting in an oil spill or other potential offshore engineering safety issue that would harm marine mammals and/or the North Slope environment as a whole. This publication explores the Minerals Management Service (MMS) responses to North Slope residents and other stakeholders. The following are comments and corresponding responses taken directly from the *Final Environmental Impact Statement for the Beaufort Sea Planning Area, Oil and Gas Lease Sales 186, 195, and 202* (OCS EIS/EA MMS 2003-01).

Alaska's Environmental Sensitivity

Public Comment - (EIS)

"Alaska's Beaufort Sea is too productive and sensitive to threaten with OCS oil and gas development. Alaska is the only state in the nation where large portions of coastal residents depend on marine resources for subsistence.

The fierce climatic conditions, high winds and seas, sea ice, and cold temperatures challenge offshore technologies far beyond their capabilities at present. These conditions make ecosystems more vulnerable and less resilient to disturbance and perturbations. Because of the inhospitable climate, challenging spill response and extreme productivity/sensitivity of the marine ecosystems off Alaska, this is the last place in the world that OCS exploration and development should be allowed.

Alaska shoulders more risk than any other state in the U.S. and the Beaufort sale areas constitute some of the riskiest acreage proposed for leasing. This is both unacceptable and dangerous to Alaska's unique environment. Please don't place our environment at such a risk and add this lease sale area to the moratoria as is appropriate."

The MMS Response

The MMS recognizes that the Beaufort Sea is a productive and sensitive area that has a very unique environment. However, oil and gas exploration and production have been successfully and safely conducted in other areas of the world where the environment is equally productive, sensitive and unique in its own right.

The Gulf of Mexico region, for example, is an extremely productive ecosystem and is very sensitive to changes introduced by the oil and gas industry. The area is home to endangered and threatened species and supports a huge fishing industry. However, that has been addressed through a comprehensive regulatory process and through site- and situation-specific mitigation.

The United States has the most rigorous regulatory regime for protection of the environment from potential impacts related to offshore oil and gas activities of any country. One of the most serious threats to the offshore environment is the potential for oil spills from tankers carrying imported oil from foreign counties. Domestic exploration and production are needed to lessen this very real threat.

Notes:

Marine Life and the Marine Ecosystem

Public Comment - (EIS)

"The proposed oil and gas lease sales endanger the fragile marine environment off the coast of northern Alaska. Productive marine ecosystems, marine mammals, sea birds, and coastal communities are all at risk from potential blowouts and pipeline oil spills. Even small amounts of oil can negatively affect marine life. Oil pollution increases susceptibility to diseases in fish; inhibits phytoplankton productivity; and interferes with reproduction, development, growth and behavior of many species.

Additionally, marine life is threatened by toxic sediments and cuttings disposed of at sea during exploratory drilling, noise pollution generated by vessel traffic, drilling, platform work, seismic testing, and the laying of miles of pipelines in or on the sea floor."

The MMS Response

Topics listed in this comment letter have been addressed in this EIS and satisfy the requirement of NEPA disclosure, discussion, and analysis. Effects of the proposed action have been discussed either in the physical, biological, and/or social-cultural sections of this EIS. See the EIS Table of Contents for specific topic listings.

Notes:

OffShore Perspectives

Public Comment - (EIS)

The MMS Response

Spill Cleanup in Broken Ice

"Fierce climatic conditions, high winds and seas, sea ice, and cold temperatures challenge offshore technologies and spill cleanup far beyond present capabilities. Recent oil spill drills both by oil companies and contractors have confirmed their inability to effectively respond to a spill in broken ice and open water conditions that prevail for most of the year in the Beaufort Sea. The Exxon Valdez oil spill of 1989 taught Alaskans and the world harsh lessons about the ability to clean up a significant oil spill. Scientific studies of the Exxon Valdez oil spill show long-lasting and significant damage to fish, wildlife, and subsistence."

The field tests conducted during 2000, did not demonstrate a failure of industry to contain and clean up oil. The tests were key in establishing reasonable maximum operational limits for one set of tactics. The efficiency of the tactics demonstrated was more limited than initially proposed, but they would have been effective in removing oil in a broken-ice environment. In a response situation, these tactics would be only one of the methods used to remove oil from the environment. In a real-world response situation, responders would be able to use any of the various tactics and response equipment they maintain in their response toolbox, including in situ burning.

Additional field tests were conducted during July 2002 to demonstrate response tactics developed to improve response capabilities in broken ice. The new tactics were highly effective and expand industry's window of operation and provide better access in broken-ice conditions, should an oil spill occur.

Also, the broken-ice season is a short period of time. Solid-ice conditions are present nearly nine months out of the year, and industry has an extensive inventory of equipment and tactics that can be used to effectively remove oil under those conditions.

Notes:

Public Comment - (EIS)

The MMS Response

Possible Need for Drilling Restrictions

"While the alternatives presented in the EIS do not differ significantly for exploration activities, once the projects move into the production phase, the increase in the number of producing wells can also lead to an increase in the risk of spills. For this reason, the state supports the use of drilling restrictions or other spill prevention measures during open water periods and until the ice thickness is sufficient to support heavy equipment as described in the Alaska Clean Seas Tactics Manual.

After initial entry into a formation, production well shutdown and start-up present the next highest spill risks. Current drilling restrictions such as those employed at the Northstar Project can reduce the spill risk. In addition, most oil spill response resources for the North Slope are located in the Deadhorse area. The geographically expanded exploration and production activities in the lease sale area may require the establishment of other oil spill response depots east and west of Deadhorse to ensure timely oil spill responses."

The MMS conducts a rigorous review of industry-proposed exploration and development activities to ensure that proper safeguards are in place to prevent the release of oil into the environment. These include employee training in well control, requiring that well-control safety equipment include blowout preventors and requiring that the sufficient primary well-control measures are available during the drilling of the well (drilling-fluid components).

The MMS also has established a standard set of requirements that must be followed to establish platform suitability and that the drilling equipment is sufficient for the proposed operation. Finally, the MMS believes that industry has sufficient oil-spill-response capabilities to address control and removal activities year-round, either through mechanical or nonmechanical means. We do not feel that drilling restrictions beyond what already is required are necessary.

Notes:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

Prepared by: EDAW | AECOM

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:

Barbara Bamberger
Email. Barbara.Bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Web Site: www.edaw.com/mms

OFFSHORE PERSPECTIVES:
OIL SPILL MODELING, RESPONSE AND CLEANUP

OffShore Perspectives

Volume 2 December 2006

Public Comment and Official Responses: Oil Spill Modeling, Response and Cleanup

This is the second of three worksheets that present public comments and official federal agency responses from Environmental Impact Statements (EIS) developed for lease sales in the Beaufort Sea just off the Alaskan North Slope. During the EIS process, the public is invited to share concerns and issues, which are then addressed as part of the final document. This publication offers selected public comments and agency responses that touch on recurring themes, present the highest degree of community concern, or are key to understanding how the federal government deals with offshore lease sales and their subsequent results.

Introduction

Oil spills in the Arctic can be devastating to the environment, flora and fauna, and the native population's livelihood and food supply. That is why understanding the risks involved – through modeling and real-world experience in other locations – as well as constantly improving response and cleanup technologies are critical aspects of oil lease planning. This publication explores the Minerals Management Service (MMS) responses to North Slope residents and other stakeholders. The following are comments and corresponding responses taken directly from the *Final Environmental Impact Statement for the Beaufort Sea Planning Area, Oil and Gas Lease Sales 186, 195, and 202 (*OCS EIS/EA MMS 2003-01).

Public Comment - (EIS)

The MMS Response

Oil Spill Risk

"I am writing to comment on the three proposed federal lease sales in the Beaufort Sea. I am very much opposed to any new oil and gas leasing across the Arctic coast. I feel offshore lease sales jeopardize the integrity of the wilderness, wildlife, and the coastal habitats of the Arctic Refuge and Teshekpuk Lake. Oil spills pose great threat to this sensitive area. Industry has not yet developed a fail-safe means of cleaning up the Beaufort Sea if a spill occurs."

The MMS has participated in equipment and tactic demonstrations in the Beaufort Sea during 1999, 2000, and 2002, in conditions including open-water, spring broken-ice, and fall freeze-up. The equipment, tactics, and personnel are capable of responding to an oil spill in all of these. The oil-spill-response demonstrations conducted to date have identified individual tactic limitations and have led to the addition of new tactics to improve effectiveness in broken-ice conditions. In an actual response situation, industry would be able to use every tool at their disposal; they would not be limited to a single skimming configuration but would mix and match tactics to most efficiently access oil. The MMS believes that industry will be able to conduct a credible spill response regardless of the time of year. Industry has an extensive spill-response toolbox that includes mechanical response, *in situ* burning, and tracking capabilities. Research to improve oil-spill response is being actively pursued by both industry and MMS to add new tools and increase effectiveness of existing methods and equipment.

Notes:

Public Comment - (EIS)

The MMS Response

Wildlife Impacts

"The Beaufort Sea is home to polar bear, walrus, seals, migratory birds (including the Pacific black brant, threatened spectacled and Steller's eiders) and the endangered bowhead whale. Oil spills in this harsh, ice-dominated environment would have a severe impact on many of these species, particularly on bowhead whales during migration off Barrow and offshore from the Arctic National Wildlife Refuge, and on black brant during molting along the coast in the Teshekpuk Lake area of the NPRA."

The EIS recognizes the potential threats that oil spills pose to endangered bowhead whales, polar bears, walruses, seals, and many species of migratory birds, including brant and the threatened spectacled and Steller's eiders, and their habitats. See Section IV.C - Analysis of Effects by Resource and Alternative: IV.C.5 - Endangered and Threatened Species, including bowhead whale and threatened eiders; IV.C.6 - Marine and Coastal birds, including brant; and IV.C.7 - Marine Mammals, including polar bear, walrus, and seals for a detailed analysis of potential effects of oil and gas development on these species. Routine activities associated with such developments are not likely to result in significant adverse effects on birds or marine mammals. Overall, the chance of one or more spills occurring and entering the offshore waters is 8% to 10%, and the chance of one or more spills occurring and contacting resource areas important to these species is lower, on the order of 2% or less.

Notes:

OffShore Perspectives

Public Comment - (EIS)

The MMS Response

Traditional Knowledge of the Environment

"In the Executive Summary of the EIS, as part of the scoping process, MMS has held government-to-government and public forum meetings seeking traditional knowledge of ice movement, animal behavior and the like, but the comments and concerns regarding off-shore exploration activities has not been heeded. My statement does not indicate that the people being impacted by the oil and gas industry are giving up the fight to keep our traditional ways, but if MMS does not even have consideration for health and welfare in cases of oil spills on the Slope, why do you even bother to hold these public forums, and to permit and develop oil production in our garden? Additionally, marine life is threatened by toxic sediments and cuttings disposed of at sea during exploratory drilling, noise pollution generated by vessel traffic, drilling, platform work, seismic testing, and the laying of miles of pipelines in or on the sea floor."

The MMS acknowledges the importance of traditional knowledge and values its government-to-government relationships with North Slope tribes. We believe that the best deterrent to any disaster is to build facilities and pipelines that will withstand the rigors of arctic ice and weather forces, and we believe that traditional knowledge and the concerns heard through government-to-government consultation have helped in our understanding of such designs, in the development of mitigation, and in supporting conflict avoidance agreements that minimize impacts. However, nothing is foolproof, and there must be contingencies for oil spills.

Since 1995, the MMS has tried to take a more collaborative approach in its public involvement. The MMS has hired a community liaison person who spends a large part of his time maintaining contacts with local North Slope Native communities and ensuring that scoping and public meetings are scheduled to not conflict with local activities. As an agency fully committed to consultation under the executive orders for environmental justice and government-to-government relations, the MMS believes that the Department of the Interior needs to seriously consider an appropriation to its annual budget that provides funding to assist tribal governments with training and travel funds to assist their participation in Department of the Interior planning and decision-making processes under these orders.

Notes:

Public Comment - (EIS)

The MMS Response

Oil Spill Modeling

"Oil spills in this harsh, ice-dominated environment and would have a severe impact on many of these species – particularly on the bowhead whales during migration east of Barrow and offshore from the Arctic National Wildlife Refuge, and on black brant during molting along the coast in the Teshekpuk Lake area of the NPRA. Considering the industry's proven lack of ability to clean up oil spills in the Beaufort Sea during most of the year as well as the maximum of 10-15% of spilled oil that is ever "cleaned up" even in much less severe climates, the risks to these species and sensitive areas are too great to allow new lease sales to go forward."

Overall, the chance of one or more spills occurring and entering the offshore waters is low (8% to 10%), and the chance of one or more spills occurring and contacting resource areas important to these species is lower, on the order of 2% or less.

Notes:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

Prepared by:

EDAW | AECOM

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:

Barbara Bamberger
Email. Barbara.Bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Web Site: www.edaw.com/mms

OFFSHORE PERSPECTIVES:
MITIGATION AND COMMUNITY IMPACT ASSISTANCE

OffShore Perspectives

Volume 3 December 2006

Public Comment and Official Responses: Mitigation and Community Impact Assistance

This is the third of three worksheets that present public comments and official federal agency responses from Environmental Impact Statements (EIS) developed for lease sales in the Beaufort Sea just off the Alaskan North Slope. During the EIS process, the public is invited to share concerns and issues, which are then addressed as part of the final document. This publication offers selected public comments and agency responses that touch on recurring themes, present the highest degree of community concern, or are key to understanding how the federal government deals with offshore lease sales and their subsequent results.

Introduction

Native residents of the North Slope Borough feel that offshore oil exploration and production create great risk to their way of life but provide little benefit. The MMS pursues community impact assistance to address the perceived lack of benefits and other mitigation measures to address the potential effects of a spill. This publication explores MMS responses to North Slope residents and other stakeholders. The following are comments and corresponding responses taken directly from the *Final Environmental Impact Statement for the Beaufort Sea Planning Area, Oil and Gas Lease Sales 186, 195, and 202* (OCS EIS/EA MMS 2003-01).

Public Comment - (EIS) | **The MMS Response**

The Inevitability of Impacts

"Our concerns have been the same since the federal and state governments first considered offshore oil and gas leasing in the Beaufort and Chukchi Seas. We don't like it. We think it's a bad idea for all kinds of reasons. Offshore leasing leads to offshore exploration. While exploration with minimal impacts is possible with seasonal and other restrictions, it leads to offshore development and production. Even if there are no oil spills, production causes year-round impacts. Industrial noise in the marine environment has altered the distribution of bowhead whales and other subsistence resources in the past. The subsistence harvest of bowheads has always defined our Inupiat culture. Our communities have known hardship in the recent past when industrial operations forced whales out of the safe reach of our hunters. Protection of the opportunity for us to safely engage in the subsistence hunt of bowhead whales and other marine species should have the highest priority when governments are deciding on the best use of the Beaufort and Chukchi Seas."

The MMS has listened and reacted to the North Slope Borough's concerns in drafting the Beaufort Sea Multiple Sale draft EIS. The MMS has incorporated mitigating measures as part of every alternative, except the No Lease Sale Alternative. These standard mitigating measures have been developed during previous lease sales and are effective in reducing effects on subsistence whaling. The MMS will continue to work with the Inupiat people to address concerns related to offshore oil and gas activities that potentially could affect the bowhead whale subsistence harvest. Two stipulations included as part of the current and past proposals address these concerns. (1) the stipulation on Industry Site-Specific Bowhead Whale-Monitoring Program provides site-specific information about the migration of bowhead whales, and (2) the stipulation on Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities helps reduce potential conflicts between subsistence hunters and whalers, and oil and gas activities. It helps reduce noise and disturbance conflicts during specific periods of time, such as the annual spring and fall whale hunts. The consultations required by this stipulation ensure that lessees, including contractors, consult and coordinate events including both the siting and the timing with regard to subsistence activities. This stipulation applies to exploration and development and production activities.

Notes:

Public Comment - (EIS) | **The MMS Response**

The Need for Socioeconomic/Sociocultural Analysis

"In its comments on the DEIS for the OCS Oil and Gas Leasing Program: 2002-2007, the AEWC also requested that the MMS prepare a revised discussion on Sociocultural Impacts and Environmental Justice, including a balanced account of the "Socioeconomic Environment: for the North Slope," with a reasoned discussion of mitigation measures. The MMS has yet to provide this revised discussion."

The draft EIS for the 2002-2007 OCS Oil and Gas Leasing Program is a national, programmatic document that does not approach the level of detail that a discussion of mitigation would require. The document is meant to be an overview. A "reasoned discussion" of mitigation would come at the lease-sale EIS stage. We believe that the draft and this final multiple-sale EIS for the Beaufort Sea have provided such a discussion. Mitigating measures are built into the analysis, and effects are assessed as though they were in place. New stipulations also are being considered. For instance, concerns about potential effects to Inupiat bowhead subsistence whaling are addressed to some degree by proposed Stipulation No.7 - Pre-Booming Requirements for Fuel Transfers. This stipulation would moderate possible effects on this activity. Even though the stipulation would not prevent a fuel spill, pre-booming would help with spill recovery and would serve to moderate potential effects.

Notes:

OffShore Perspectives

Public Comment - (EIS)

The MMS Response

Why Focus on the Beaufort Sea

"We are frustrated that most planning areas off the shores of the lower 48 states are withdrawn from consideration or are under a congressional moratorium. We do not think that these areas should be leased, but question why they are off-limits while the Beaufort Sea is not. MMS has explained that several factors contribute to decisions about offering areas for leasing. The Final EIS for the 2002-2007 OCS Oil and Gas Leasing Program was published in April. It says that these factors include not only environmental concerns, but also oil and gas potential, industry interest, and the views of the Governors of coastal states. Other factors that we consider critical were not mentioned. Shouldn't it matter that the prevailing conditions of an area limit the ability to mitigate the potential risks of oil and gas operations? And shouldn't a primary factor be the views of the local residents who live adjacent to the planning area and who will feel all of the impacts of leasing? MMS continues to aggressively lease in remote, highly sensitive, challenging, and vulnerable arctic waters over the loud and continuous objections of the Native Inupiat population. We bear all of the risks and receive very little of the benefit. This raises significant questions of fundamental fairness and environmental justice."

The U.S. energy plan is a national program that takes into consideration competing energy sources – domestic and foreign, renewable and nonrenewable – together with economic and political interests. The Interior Department has participated in discussions about areas considered for moratoria or exclusion by Executive Order, but the decisions are made by the Congress or the President. The Department continues to support leasing in areas where environmental and other citizen concerns can be addressed through mitigation.

Notes:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

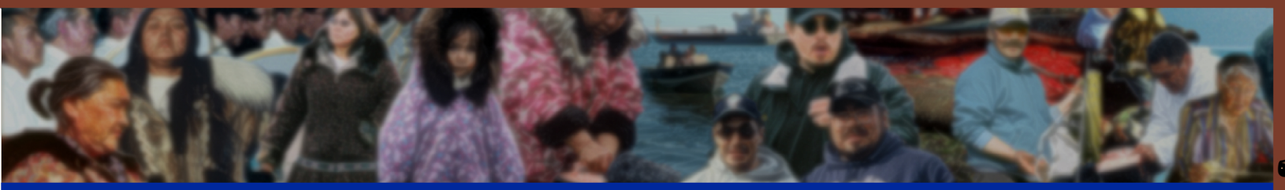
Prepared by: EDAW | AECOM

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:

Barbara Bamberger
Email. Barbara.Bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Web Site: www.edaw.com/mms

OFFSHORE OUTLOOK:
FOCUS ON PRODUCTION FACILITY ENGINEERING



Summary

Design details of offshore facilities are always customized, but the same basic safety features apply: careful siting and orientation, massive weight and strength, elevation, erosion control, sub-seafloor shut-off valves, sub-seafloor pipelines, peer review of design specifications, employee training, alarm systems, and routine operational inspections to ensure compliance with regulations. Despite the dangers of the Arctic environment, it is possible to engineer production facilities to operate safely in the Beaufort Sea. Planned safeguards in design, during construction and throughout the operational life of the facilities, are numerous and rigorous.

Feedback:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

Prepared by:

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:
Barbara Bamberger
Email. barbara.bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

OffShore Outlook

Volume 1 December 2006

Focus on Production Facility Engineering

This is the first in a series of four newsletters intended to address North Slope Borough community concerns about offshore oil activities. Each newsletter will focus on a specific topic, beginning with a summary of concerns expressed in regard to lease sale documents by individuals on the North Slope, and provide information addressing these concerns.

Concerns Expressed by Community*

Offshore Oil Activities in Arctic Environment

The Arctic is a harsh, yet fragile environment. Because of that, offshore oil activities are often seen as problematic, at best. Strong currents and severe ice conditions can damage anything, notably oil production facilities, typically called platforms. Anything man-made appears bound to fail, especially under these conditions.

Impacts to Livelihoods

When offshore oil production facilities fail or are damaged, they could dramatically impact the marine environment, marine mammals (especially whales), and the livelihoods of the North Slope Iñupiat population.

* *Based on community concerns reflected in comments to the Environmental Impact Statement for Lease Sale 186.*

Understanding Production Facility Engineering

The Minerals Management Service (MMS) works hard to protect the Arctic region. One important priority is to prevent an oil spill from occurring. Prevention involves research, planning, training, regulation, and inspection to ensure that operators use the highest quality design, materials, equipment, and practices to safeguard against accidental discharge of oil in the ocean.

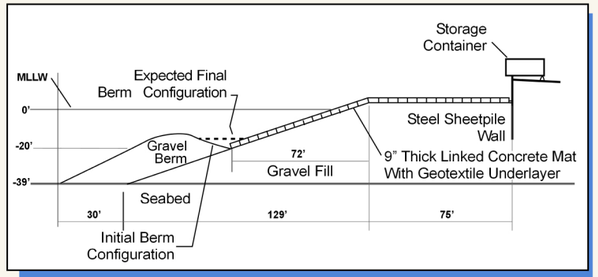
Production facilities are engineered to fit their environmental operating conditions. Offshore facilities can be grouped into two main types, depending upon whether extraction will occur in shallow water with land-fast ice, or in deep water, amidst multiyear ice. The explanation on the next two pages highlights major safety measures and is intended to respond to comments from the community.

Shallow Water Facilities

The most typical and cost-effective design for the relatively shallow land-fast ice zone involves gravel islands. These are specifically designed to operate safely in Arctic conditions, with many design features that make it possible to withstand the region's extremely strong natural forces such as ice, wind, and water movement.

Site and orientation

Gravel islands are uniquely situated to minimize the impact of storms and ice movement by reducing facility exposure to prevailing winds and currents. Production facilities and wells are located toward the center of the island, or leeward side, to further protect against ice and waves. Also, the surface contour of the island leads any runoff into collection pits away from production facilities and away from surrounding waters.



Gravel Island

Mass and strength

Gravel foundations are generally mined onshore and transported by trucks using ice roads. Once the gravel fill is in place, workers compact, grade, and shape the islands for mass and material strength. For example, the Northstar gravel island is 690 feet long and 590 feet wide, with a total work surface of approximately 5 acres. The total mass provides sufficient resistance to lateral movement under maximum ice loads. Minimizing such movement further reduces the risk of failure.

Erosion control

At the seafloor, the island's base is protected by a gravel berm that can be replenished. The slope most exposed to currents and waves is protected with interconnecting concrete blocks that cover the gravel from a depth of 20 feet to 6 feet above sea level.

The concrete blocks are linked together by stout chains and secured by heavy anchors. A fine filter material between the gravel and concrete blocks also helps control erosion.

Effective buffering

Beyond the elevated rim of the slope, a broad gravel bench covered with concrete mats reduces wave energy, increases resistance to ice over-ride, and induces natural formation of an ice rubble field to further prevent over-ride from reaching the interior.

At Northstar, the buffer extends 75 feet from the perimeter. Beyond the buffer area, an additional 15- to 30-foot wall of steel armor (vertical sheet-pile) prevents wave or ice impacts from even rare 100-year storm events.

Safety shut-off valve

Each well has an automatic shut-off valve at least 1,500 feet below the ocean floor so that oil can be confined and secured during emergency conditions.

Employee training

All offshore operations involve highly selective hiring practices. These experienced employees are specially trained to recognize and mitigate unsafe conditions. Alarms within the production facility alert operators about changing conditions so they can monitor events and take timely action.

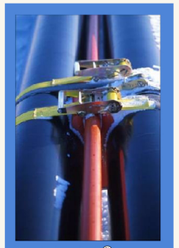
Other equipment measures

Once drilling begins, fluids can be separated onsite or onshore. Pipelines are designed by material and thickness to resist both internal and external forces. Automatic valves at each end of the pipe control flow and can isolate any problem that arises. Pipelines are buried below the ocean floor to keep them safe from ice gouges and other dangerous forces. At Northstar, geological seismic surveys determined that 7 feet was a safe burial depth.

Leak detection and location system

At Northstar each pipeline is fitted with a leak detection system sensitive enough to measure a loss of less than 1% of the flow. One instrument, the LEOS®, can also detect small vapors in the surrounding environment near a pipeline to signal even smaller leaks.

Further, all offshore pipeline systems are significantly thicker than onshore pipelines, and they are monitored periodically (at least every three years) for damage, corrosion, or displacement with internal smart-pig tools. In addition, buried pipelines at Northstar are protected by electro-chemical processes that use electric current to inhibit rust formation and corrosion.


"LEOS"®


Smart-Pig Tool

Verification and enforcement

Offshore design specifications are carefully checked in advance of construction. The island design of every project is thoroughly scrutinized by the MMS staff and by third-party engineering firms to ensure that they are sufficiently strong to withstand the Arctic Ocean environment. This continues during construction and installation. Once production begins, routine inspections ensure compliance with the regulatory framework. At Northstar, external inspections occur several times a year.

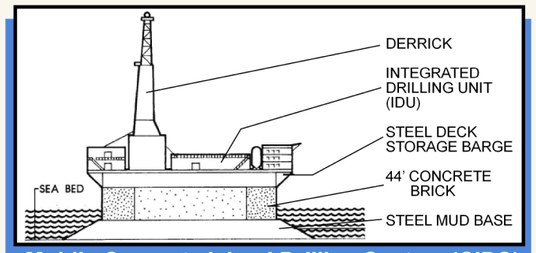
Deep Water Facilities

While shallow water production has occured recently, to date there has been no production facilities located in the deeper (more than 40 feet) waters of the Beaufort Sea. These deeper waters are where multiyear pack ice meets annual land-fast ice to form the more dangerous sheer-ice zone. There are, however, facilities compatible with Arctic conditions operating in other locations, such as Sakhalin, a Russian island in the North Pacific; or the Caspian Sea basin, bordered by Russia and the Caspian States. So far, two engineering options have been developed for deep exploration and potential production in the Beaufort Sea.

One design is the mobile Concrete Island Drilling System (CIDS) originally developed for use in the Beaufort Sea in 1984. The CIDS is composed of honeycomb, modular, concrete "bricks" (295 feet square by 44 feet high). These bricks sit on a 25-foot steel base on the ocean floor and support an integrated drilling rig high above sea level.

The interlocking structure and massive weight of the CIDS provide exceptional resistance to lateral, transverse, and torque forces. As noted earlier, this further minimizes vulnerability of the facilities to physical failure.

The CIDS is designed to resist ice movement and to displace lateral force outward to the naturally occurring pressure ridges of the ice pack. It was designed so that several foundational "bricks" could be stacked to allow for production in a wide range of water depths.



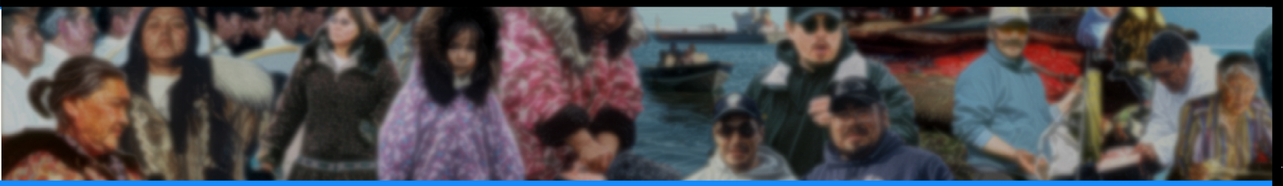
Mobile Concrete Island Drilling System (CIDS)

The other engineering option is the Steel Drilling Caisson (SDC). Like the CIDS, this system also relies on ocean floor contact and ballast weight to resist ice forces. It has been used successfully for two seasons on different drill sites in the Canadian Beaufort Sea, using a modified tanker for its shell. The SDC has also been used successfully to drill five exploration wells in the Alaskan Beaufort Sea. In its current configuration, the SDC is 715 feet long and 360 feet wide and can work in water depths from 25 to 80 feet.


Steel Drilling Caisson (SDC)

Engineers work to ensure that deep water facilities can be developed to the same level of safety as shallow water facilities. Pipelines for the transport of fluids to shore will undergo the same rigorous planning and review as their shallow-water counterparts. Each site-specific review will determine the type and amount of protection needed.

OFFSHORE OUTLOOK:
FOCUS ON OIL SPILL RESPONSE AND CLEANUP



Ongoing Efforts

The MMS continues to fund research and to conduct field tests to improve the technologies and tactics to detect, contain, and clean up spills. Recent breakthroughs include use of ground-penetrating radar to detect oil in or under thick layers of solid ice, improvements in surface detergents that herd oil into thicker mats to improve mechanical recovery, and improved techniques for finding and mining oil out of melting ice sheets. Of course, challenges still exist, but effective measures for use in the offshore Arctic environment are available and continue to be improved.

Summary

Rapid response and effective cleanup techniques are critical for minimizing effects of a spill. Therefore, any operator who fails to meet stringent preparation and response requirements can be restricted from operating. A variety of response and cleanup techniques have been proven effective, even under challenging Arctic conditions such as broken ice. The techniques and technologies continue to improve.

Feedback:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

Prepared by:

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:
Barbara Bamberger
Email. barbara.bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

Volume 2 December 2006

OffShore Outlook

Focus on Oil Spill Response and Cleanup

This is the second in a series of four newsletters intended to address North Slope Borough community concerns about offshore oil activities. Each newsletter will focus on a specific topic, begin with a summary of concerns expressed in regard to lease sale documents by individuals on the North Slope, and provide information addressing these concerns.

Concerns Expressed by Community*

Nothing can clean up a spill in Arctic waters

Oil exploration and production will almost certainly result in oil spills, either from platform failure or pipeline breach. There is no effective method for responding to and cleaning up an oil spill in Arctic waters, given the harsh climate, especially during broken-ice conditions.

Oil spills will seep under the ice and spoil our hunting grounds

The lack of experience with cleanup in the Arctic puts our livelihoods, our culture, and one of the most sensitive areas of North America at very great risk.

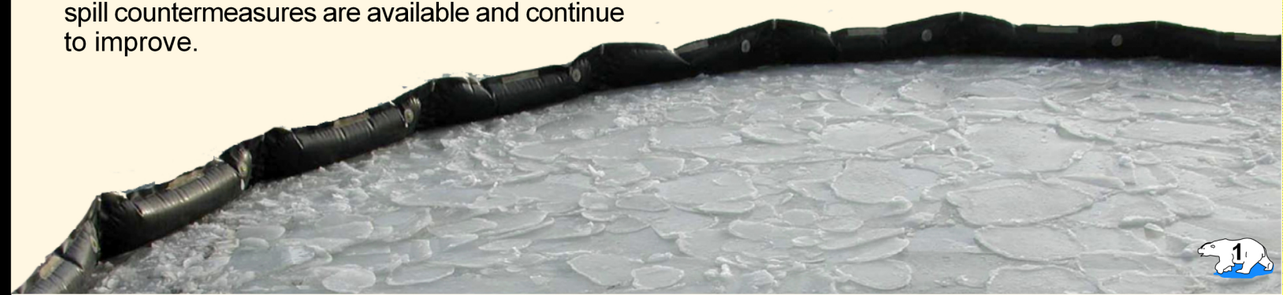
* *Based on community concerns reflected in comments to the Environmental Impact Statement for Lease Sale 186.*

Understanding Oil Spill Response and Cleanup

The Minerals Management Service (MMS) is keenly focused on deploying the best oil spill control techniques in the Arctic region. Prevention of spills is the first priority. In the event of a spill, however, the priorities are early detection and rapid response, containment, and efficient cleanup operations.

This newsletter will explain the major features of current oil spill response technologies and cleanup strategies specific to Arctic waters. It will describe how spills are detected, the manner in which responses are planned, and containment/cleanup options that can be used in Arctic ice and open water conditions.

While Arctic conditions do tend to change the tool-kit for spill control, they do not prevent an effective response. Years of research and operational experience show that effective oil spill countermeasures are available and continue to improve.



Detection of Spills

To detect any leak as quickly as possible, each offshore pipeline is fitted with an independent leak detection system sensitive enough to measure a loss of pressure in the flow of oil even when it is less than one barrel. The system can also identify oil or gas in the surrounding area to detect even smaller leaks. This new detection system runs concurrently with the standard "mass balance" detection system that focuses on changes in flow pressure.

A demonstration in April 2004 verified the early warning capabilities of this system under ice. The leak detection system uses a specially designed air-filled tube that only allows hydrocarbon vapors to penetrate. The system's computer is capable of diagnosing a leak to within about 50 feet.

Planned Response

Numerous federal, state, and local laws and regulations require operators to maintain adequate Oil Spill Response Plans for both onshore and offshore facilities in Alaska.

These plans require operators to maintain oil spill equipment and staging areas in a high state of readiness; formalized notification and response procedures; evidence of financial responsibility and adequate insurance; and evidence of completing mandatory personnel training, equipment testing, and periodic drills. Operators must demonstrate the ability to mobilize within 72 hours and successfully deploy cleanup equipment. The State of Alaska requires industry to meet stringent standards through the primary use of mechanical cleanup equipment.

If an operator fails to demonstrate this at any time, the MMS and the State of Alaska will impose work-stop orders or seasonal drilling restrictions. The North Slope Borough also has authority to provide input into all spill response decisions. Other laws and agreements provide for rapid distribution of mitigation funds as compensation for loss of subsistence foods or disruption to cultural lifestyle.

Regional oil spill cooperatives share funds and resources across interested stakeholder groups to train personnel, sponsor research and development, conduct field tests, and purchase equipment and machinery for spill control.

Alaska Clean Seas (ACS) is the cooperative for both offshore and onshore operations in the Prudhoe Bay area and has been a catalyst in the evolution of spill response preparations.

Containment and Cleanup

Conventional cleanup techniques include:

- Containment Booms
- Burning
- Dispersants (offshore, deep water response)
- Mechanical Recovery (skimming/scooping)
- Absorbents (onshore response)
- Surfactants (offshore response)
- Ice Techniques (for Arctic response)
- Enhanced Biodegradation (to assist decomposition)

Several variables affect containment and cleanup, including weather, water depth, proximity to land, chemical nature of the slicks, biological exposures and sensitivities, availability of equipment and materials, and the scale and cost of mobilization.

Containment boom and skimmer being tested with oil at the National Oil Spill Response test facility

Containment and cleanup are always based on the specific conditions surrounding a particular spill. In the Arctic, there are three seasonal conditions that affect strategy: solid ice, open water, and broken ice. Each season dictates a customized strategy to optimize containment and cleanup.

Solid Ice

This season allows the best prospects for oil recovery. Cleanup typically mimics an onshore response, bringing heavy equipment such as bulldozers and front-end loaders into the spill area.

In winter, a spill would be subject to extremely low temperatures, thick ice cover, and drifting snow. While this can hamper cleanup in some aspects, it also facilitates cleanup in many ways.

For example, semi-solid oil would likely become a thick mat on top of the ice. Snow is an excellent absorbent and could be mixed with the oil to form mulch, making it possible to handle a large volume of oil quickly and safely.

Any oil that leaked under the ice might be forced into thick pools or natural concavities, permitting removal through drilled holes or containment trenches.

Research shows that oil spilled under stable land-fast ice in the Beaufort Sea will not spread more than a few hundred feet because under-ice current is low and storage capacity is high. Also, artificial formation of ice traps from sprayed water can contain oil to buy more response time. When response crews pump or burn oil from a trapped layer, they typically deal with fresh crude, even months after the spill. As ice melts in spring, remnant oil naturally rises to the surface and cleanup may resume.

Open Water

During this season, spill response in Arctic waters is as good as, or better than conditions in other offshore areas. Near-freezing temperatures of the Arctic Ocean present a problem for some aspects of cleanup but help reduce other challenges.

For example, cold reduces the efficiency of some skimming devices because the oil is more viscous. On the other hand, increased viscosity helps limit the extent to which oil disperses. Oil slicks in cold water typically spread several hundred times slower than in warm water.

Containment booms tend to be the first equipment mobilized for an open water spill and the last to be removed. They help concentrate the oil for skimming and keep it out of sensitive areas. Options for skimming oil include a weir, belt, disc, or rope mop.

In situ burn experiment in cold water and broken ice conditions

Burning, when appropriate, is also more effective with thicker oil. Recent field studies show burning can remove more than 90% of slicks in open water when conditions allow ignition.

Broken Ice

This season, encompassing both autumn and spring, presents the most challenges for cleanup operations. Demonstrations and drills have shown that mechanical skimmers and other traditional response equipment, when used without modification, are much less effective in broken ice. Yet, important differences exist between broken ice conditions in autumn and spring.

During freeze up (autumn), once ice crystals begin to form, skimming systems lose effectiveness. The preferred response is to trap oil in the ice for extraction after freeze up is complete (winter). For this reason, the offshore Northstar facility may not pursue new drilling during freeze up conditions.

During break up (spring), broken ice conditions are still problematic, but ice fragments create a natural containment, enhancing burn-off or modified skimming operations.

Successful skimming operations demonstrated in broken ice conditions in 2000

Recent research and field experiments have led to great improvements. For example, in July 2002, ACS successfully demonstrated cleanup in 70% broken ice coverage. While field tests in 2000 had established skimming equipment limits at 10% to 30% ice coverage, the new tactic eliminated a large boom and multiple support vessels so that maneuverability improved.

The improved tactic uses small skimming devices that operate from both sides of the vessel to recover oil that is contained by ice floes. In field tests, the vessel was able to move easily into position, and the skimmers proved very effective in accessing oil floating on or between large ice floes. By avoiding problems from ice and boom interactions, the cleanup was much more successful.

OFFSHORE OUTLOOK:
FOCUS ON OIL SPILL MODELING

Summary

Because there has not been a great deal of oil development in the Arctic Ocean, it is difficult to assess the risk of a spill in a comprehensive way. Therefore, the MMS uses a complex modeling process to develop oil spill occurrence estimators for each lease sale. These are not perfect but are useful tools that are constantly being improved.

Feedback:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

Prepared by:

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:
Barbara Bamberger
Email. barbara.bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

OffShore Outlook

Volume 3 December 2006

Focus on Oil Spill Modeling

This is the third in a series of four newsletters intended to address North Slope Borough community concerns about offshore oil activities. Each newsletter will focus on a specific topic, begin with a summary of concerns expressed in regard to lease sale documents by individuals on the North Slope, and provide information addressing these concerns.

Concerns Expressed by Community*

We don't trust risk studies; they have not been applied to the Arctic
Human endeavors entail risk, and for offshore oil activities the obvious risk is oil spills. Yet no one quite knows how to handle spills in the Arctic because there is little experience here. For that reason, the expected frequency of spills is a major concern. With no real-time testing in the Arctic under winter conditions, how could these risk studies have meaning to us? Show us its success here, in the Arctic, in January, and then let's talk.

Any risk is too much risk when it impacts our way of life
Any spill would be significant because of the nature of the Arctic environment, the difficulty of cleanup and the significant impacts to wildlife and the entire ecosystem. Furthermore, studies for oil lease sales are too optimistic as they rarely if ever take into account the conditions particular to the Arctic and do not demonstrate worst-case scenarios.

* *Based on community concerns reflected in comments to the Environmental Impact Statement for Lease Sale 186.*

Understanding Oil Spill Modeling

This newsletter will explain the basic method by which the Minerals Management Service (MMS) models and analyzes the chance that one or more large oil spill(s) may eventually occur because of a lease sale in the Arctic Ocean. It is important to understand that oil spill occurrence estimates are not well suited to provide a basis either to support or oppose offshore production.

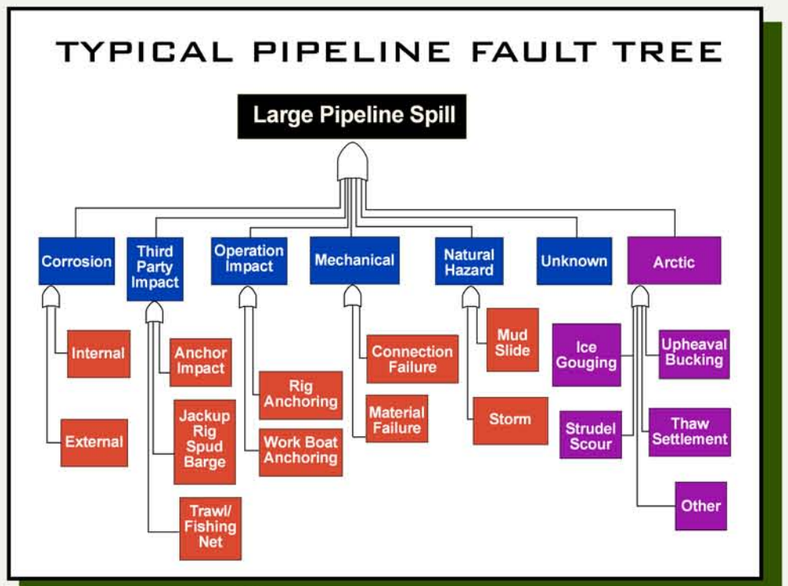
These estimates are only one tool for the comparison of alternatives. The estimates, although built upon rigorous good-faith efforts, unavoidably involve uncertainty, extrapolation, and inference. They do not predict what will occur. The MMS uses the most advanced methods available to understand and manage risk.

MMS Models and Risk Analysis

With each lease sale, the MMS assesses the chances of oil spills of various sizes and the potential environmental damage that could result. At the same time, the MMS regulates the industry to ensure that spills are prevented to the fullest extent possible.

Over time, the MMS has developed an elaborate Oil Spill Risk Analysis (OSRA) model to simulate the most likely path and contact with environmental resources from a hypothetical spill resulting from offshore production.

Within the OSRA model, analysts first establish an "oil spill occurrence estimator," which yields a rough estimate of the probability that one or more oil spills may occur over the lifetime of a potential development project involving an estimated volume of oil.



Large pipeline spill fault tree

The MMS uses this probability estimator for each lease sale Environmental Impact Statement long before project proposals or specific development plans exist, based upon an estimate of the oil and gas that may be present, as well as typical development scenarios. One tool commonly used in oil spill modeling is called the "fault tree." Fault tree models seek to incorporate all of the possible events and combinations of events that have led to, or could lead to, an oil spill from a platform or a pipeline. Fault trees provide an overview of the undesirable things that might occur and therefore provide information about the likelihood of occurrence of spills. Fault trees assume that the factors incorporated into the tree comprise the most likely significant factors that may cause spills.

Rationale for Oil Spill Modeling

A model is necessary because, fortunately, there have been too few spills in Arctic conditions to produce a credible risk assessment based solely upon historical data. Spill occurrences are typically expressed as the number of barrels spilled per billion barrels produced, but offshore production in federal waters of Alaska has not yet approached even 20 million barrels.

If analysts relied only on historical data, the production risks would appear excessively low and would not be statistically significant. Therefore, to make risk analysis for the Arctic Ocean more relevant, the MMS uses historical data from the Gulf of Mexico and then makes adjustments for regional differences.

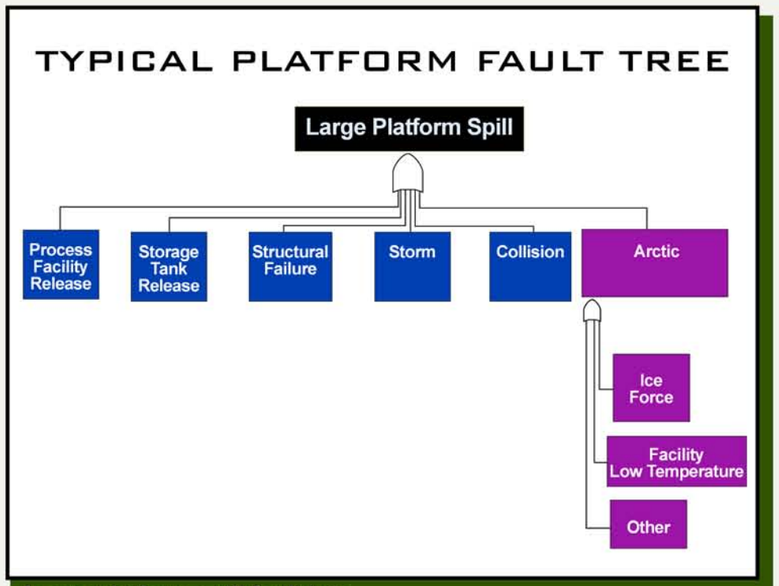
For example, some events are less likely to occur in the Arctic than in the Gulf of Mexico. These include hurricanes, mudslides, and impacts from trawler nets. Other events are more likely to occur in the Arctic. These include a combination of currents, ice, and extremely cold temperatures.

While scientists can agree that such adjustments are reasonable and appropriate in modeling exercises, the relative weight attributed to each adjustment is subject to debate.

The MMS then uses mathematical procedures to simulate spill events from offshore platforms and pipelines.

In the 2004 Beaufort Lease Sale, for example, the MMS estimated spill event rates at 0.15 platform spills and 0.10 pipeline spills per billion barrels of oil produced, with a combined 95% confidence interval of 0.21 to 0.30 oil spills. In other words, the model indicated with a high degree of confidence that no more than one large spill (defined as 1,000 barrels or more) occurs with roughly every 3 billion barrels produced offshore. At current rates of production at the Northstar facility, it would take more than 130 years to produce that amount of oil, although a spill event could still occur at any time.

That risk estimate, however, provides no basis to forecast actual spill events, location, or even potential consequences. As with any model, assumptions must be made along the way that increase its usefulness for some purposes, but decrease it for others. Many of the modeling assumptions the MMS uses are based on extreme case scenarios or broad estimations of system vulnerablility. While this is beneficial for purposes of safety planning and preparation, it decreases accuracy of the model as a forecast tool and may unduly alarm the public.



Large platform spill fault tree

Limitations of Oil Spill Estimators

After 30 years of federal leasing in Alaska and 23 lease sales, only one offshore production platform has been built, and that operates on a gravel island. Historically, estimates of risk have proven to be overstated, in part because the assumed frequency of development was too high. In addition, there are other uncertainties that affect the accuracy of the spill occurrence estimator.

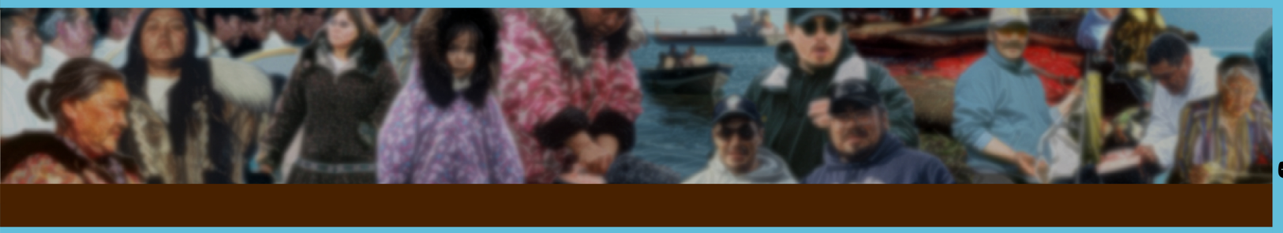
Gulf of Mexico data are sufficient for comparative analysis, but broader statistical data with more representation from Arctic facilities could strengthen analysis, if and when they become available. The bottom line is that oil spill estimators have many practical limitations. They should not be given too much emphasis, either by opponents or proponents of offshore production.

They do not, for example, help us define in social terms the Limit of Unacceptable Risk – that theoretical threshold beyond which a proposed lease sale would not be approved. That is not their intended purpose. Rather, their proper role is to show the complexity and the potential risk involved in considering alternatives.

One set of alternatives involves the consideration of different lease sale areas and deferral options. Oil spill models can help decision makers evaluate the tradeoffs from different sale options. New alternatives could come into play if a lease sale actually led to development and production. In that case, the development scenario could become far more specific and more accurate spill estimators could help guide engineering decisions about how to achieve the best precautionary safeguards.

Research and data collection to improve modeling are ongoing. Perhaps in the future, oil spill occurrence estimators will be empirical and sophisticated enough to establish firm risk scenarios with high confidence intervals. This could happen only after a considerable amount of production in the Arctic. In the meantime, we must understand the limitations of the current models, even as they are used as one modest tool to assist with risk analysis.

OFFSHORE OUTLOOK:
FOCUS ON MITIGATION AND IMPACT ASSISTANCE



Summary

Existing statutes and regulations have resulted in a solid record of safe, environmentally sound offshore oil and gas operations in the Gulf of Mexico, California, and Alaska. The regulatory framework is based on the best current knowledge and is constantly refined.

Given the strong national interest in both resource development and in preserving cultural heritage, there will probably always be divergent views about how to strike an appropriate balance. For the time being, the MMS firmly believes that current stipulations, conflict avoidance agreements, deferral areas, and regulatory safeguards can and do adequately control and mitigate potential impacts on subsistence hunting activities.

Feedback:

Prepared under contract to:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

Prepared by:

EDAW | AECOM

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101

For Comments Please Contact:
Barbara Bamberger
Email. barbara.bamberger@edaw.com
Ph. (619) 233-1454 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

Volume 4 December 2006

OffShore Outlook

Focus on Mitigation and Impact Assistance

This is the fourth in a series of four newsletters intended to address North Slope Borough (NSB) community concerns about offshore oil activities. Each newsletter will focus on a specific topic, begin with a summary of concerns expressed within lease sale documents by individuals on the North Slope, and provide information addressing these concerns.

Concerns Expressed by Community*

Regulatory Framework
Federal regulation of offshore oil development that may work elsewhere is inadequate to protect Arctic subsistence whaling, seal hunting, and fishing. Specific risks to migrating bowhead whales and whale hunting include oil spills, industrial noise, or other effects from vessel traffic and offshore drilling structures.

Impact Assistance
It seems unfair that the Native population (and environment) bears virtually all of the risk of offshore oil development, yet receives very little benefit of a nationally mandated activity. Revenue sharing, or impact assistance, is the exception rather than the rule, and is generally insufficient to compensate for actual and potential losses.

* *Based on community concerns reflected in comments to the Environmental Impact Statement for Lease Sale 186.*

Understanding Mitigation and Impact Assistance Strategies

This newsletter will explain briefly how the Minerals Management Service (MMS) conceives and fulfills its role to monitor and mitigate potential adverse impacts from offshore oil development in the Beaufort Sea. The purpose of mitigation is to avoid, minimize, eliminate, or rectify adverse impacts to the community, or to fairly compensate the community for those impacts.

Because the national mission of promoting domestic production is so important, the MMS generally seeks to control adverse impacts through a combination of leasing stipulations, lease deferral areas, conflict avoidance mechanisms, precautionary design, and safe regulation.

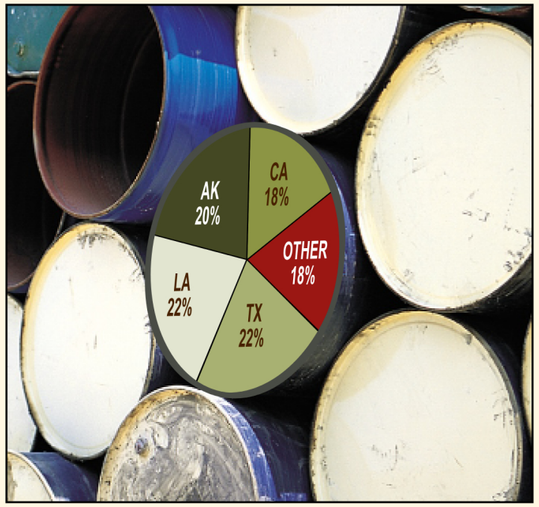
The MMS also strongly advocates for and distributes impact assistance funds directly to affected state and local communities to the extent permitted by the U.S. Congress.

The prospects for effective mitigation remain dependent upon a constructive dialogue with engaged stakeholders. Good two-way communication is essential to successful mitigation. To begin this dialogue, the following pages describe the mission of the MMS, its approach to mitigation funds, and the manner in which the MMS has developed protection measures to reduce impacts on subsistence whaling.

National Mission

The United States is the world's largest producer, consumer, and net importer of energy. The nation currently produces about 8 million barrels of oil each day, but consumes more than 20 million barrels per day, more than 60% of which must be imported. Public consensus holds that reducing dependence on foreign energy supplies is a national priority.

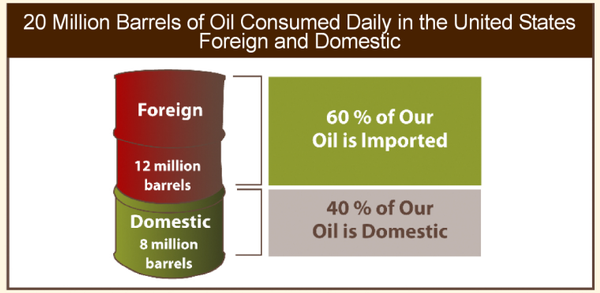
Proven domestic oil reserves (both onshore and offshore) are overwhelmingly concentrated in just four states: Texas (22%), Louisiana (22%), Alaska (20%), and California (18%). The MMS strives to promote oil exploration and development at fair market value in a safe and responsible manner.



Proven domestic oil reserves by state

National Benefits

The benefits to our nation in promoting domestic oil production are huge. It strengthens national security, reduces foreign debt, creates high-paying jobs, reduces inflationary pressures, and improves general economic activity. Benefits also flow directly to state and local governments, and their constituents, from the billions of dollars oil and gas leasing programs generate each year.



If discoveries occur, even greater revenues are generated through production royalties and corporate taxes.These monies are used to pay for government services and reduce the need for taxes. In Alaska, the MMS' offshore leasing program has generated more than $6 billion in federal revenues.

Another $591 million has been generated and distributed to the State of Alaska, Alaska Native organizations, and local communities through a variety of programs. In Alaska, 50% of the state share of federal offshore revenues goes into the Permanent Fund Account to provide direct financial benefit to every qualified resident. The other 50% is used for education and state services. Offshore revenues also fund local projects, such as playgrounds and ball fields. Such revenue streams are part of the national MMS mitigation strategy.

Mitigation Funds

In addition, new impact assistance programs are specifically designed to help mitigate the burdens, risks, and impacts that local communities endure for the benefit of their region, state, and nation. In 2001, Congress authorized a one-time allocation of $150 million to be divided among the seven states with offshore oil activities. Alaska received more than $12 million and about $2 million went to the NSB.

The Energy Policy Act of 2005 gave the MMS authority to administer a Coastal Impact Assistance Program (CIAP) funded by federal offshore revenues. The CIAP provides $1 billion — $250 million per year from 2007 through 2010 — to six coastal energy-producing states and subregions.

Protection of Subsistence Whaling

Although North Slope residents may look positively on the prosperity resulting from oil revenues, they remain concerned about access to wildlife, changes in traditional living, burdens of government process, and other emergent social problems. As one example, agency mitigation strategies must protect subsistence hunting of the bowhead whale.

Stipulations

The MMS has worked with the NSB, the Alaska Eskimo Whaling Commission (AEWC), and other local organizations to reduce or eliminate adverse effects to bowhead whales and subsistence whalers from prospective oil activities through six distinct leasing stipulations in the Beaufort Sea planning area.

Two are especially noteworthy:

Stipulation 4 requires any offshore operator of seismic surveys or drilling to conduct a site-specific monitoring program of bowhead whales to help control potential disruption during migration.

Stipulation 5 requires offshore operators to meet with local communities and the AEWC to resolve disagreements and prevent unreasonable conflicts. Before the MMS issues permits, operators must show that they have undertaken cooperative planning to ensure there are no unmitigated impacts on subsistence activities involving marine mammals. This stipulation has led to the creation of "Conflict Avoidance Agreements" between operators and whalers to provide, for example, logistical support to whaling efforts at Cross Island, near Nuiqsut.

Stipulations are enforceable requirements built into every federal lease contract in the Beaufort Sea. If the existing stipulations do not adequately mitigate significant adverse effects to subsistence hunting, the MMS is committed to working with local leaders to develop additional or alternative measures.

Deferrals

With every lease sale in the Beaufort Sea, the MMS evaluates alternative proposals that set aside specially protected zones (deferral areas) within the sale area in order to potentially reduce environmental impacts. However, the size and boundaries of potential deferral areas can change from sale to sale, causing some uncertainty.

Changes in these areas may result from new scientific information, new technologies, new priorities for national energy development, intensified interest in leasing, or changes in the subsistence protections within a given lease sale.

From the MMS perspective, deferrals are just one of many mitigation options, and decision-makers in Washington, D.C. may consider that other options in play are adequate.

Further, additional protection for subsistence hunting may be more effectively addressed as post-lease exploration and development proposals are evaluated. The MMS has invited the NSB to be a cooperating agency on any Environmental Impact Statement for proposed post-lease activities in the Beaufort Sea. Through such a relationship, the NSB could participate in protecting subsistence resources and their harvest.

More specific mitigation measures can be developed as precise locations are identified. For example, during the 2002 exploratory operation at the McCovey prospect, operators shut down the drilling rig during seasonal whale migration.


Bowhead whale calf

Monitoring

Northstar is the only existing Beaufort Sea facility that produces hydrocarbons in federal offshore waters. When development began in 1999, the MMS initiated the research program "Arctic Nearshore Impact Monitoring in the Development Area." After six years, the research has shown no adverse impacts to subsistence hunting.

The MMS also conducts vigorous inspections to ensure compliance with regulations, mitigation measures, and other operating requirements and shares the resulting information with local leadership. For example, in April 2004, an NSB representative accompanied the MMS inspection team to the Northstar facility.

The MMS will continue to monitor any future activities and develop different or additional mitigation measures, as appropriate.

OFFSHORE OUTLOOK:
OIL PRODUCTION FACILITY ENGINEERING
IN THE BEAUFORT SEA (REDESIGNED)

Offshore Outlook

Volume 1 No. 1

Oil Production Facility Engineering in the Beaufort Sea

Purpose of "Offshore Outlook"

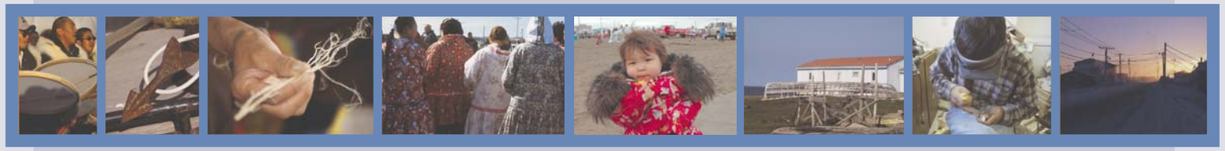
Residents of the North Slope Borough are deeply concerned about oil production and how it will affect their lives, their livelihood, and their country.

While onshore oil production has a history, offshore oil production is still relatively new to the region. Residents' concerns about offshore exploration and production in the Beaufort Sea fall into three primary categories. These concerns are the basis for a series of three newsletters.

- Oil production facility engineering –
  How can offshore facilities survive the harsh conditions?
- Oil spill response –
  What happens if something goes wrong?
- Impacts and benefits –
  What is the community's risk and what does it gain?

"We care about the impacts of oil development because we were here before oil and we will be here after oil."

(**North Slope Borough Mayor Itta,** North Slope News, March 2007).



"The subsistence harvest of bowhead whales has always defined our Inupiat culture."

(OCS EIS/EA MMS 2003-01)

Community Concerns about Oil Production Facility Engineering

The Arctic is a harsh, yet fragile environment. The harsh conditions make it more likely that anything man-made will fail; the fragility makes the risk of failure very high.

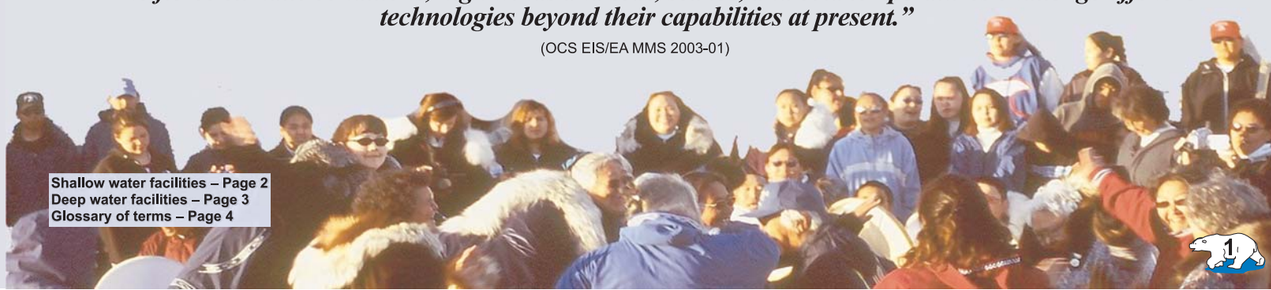
Offshore risks are different from onshore risks; strong currents and severe ice conditions can damage anything that is man-made.

Whales may be driven farther from shore by noise, pollution, and ships. This will make hunting them more difficult and more dangerous.

There is little to assure us that safe offshore oil production in the Beaufort Sea can be accomplished by the time new leaseholds begin.

"The fierce climatic conditions, high winds and seas, sea ice, and cold temperatures challenge offshore technologies beyond their capabilities at present."

(OCS EIS/EA MMS 2003-01)



Conclusion

This newsletter is intended to describe the engineering safeguards in offshore oil exploration and production. Every effort is made to prevent a facility failure of any kind. However, in an imperfect world, equipment can fail, errors can happen, and leaks or blowouts may occur.

The next newsletter in the series will deal with what happens if a failure occurs – how a leak, spill, or blowout is detected; what will likely happen; and how it will be cleaned up.

North Slope News

The North Slope Borough is hosting an oil and gas forum on September 20 and 21, 2007, in Barrow. This gathering is intended to bring together high-level decision-makers and other key personnel in a search for solutions that accommodate multiple stakeholder positions.

Upcoming events:

September 2007
Thursday, Sept. 27 – City Council Meeting

October 2007
Thursday, Oct. 18 – Alaska Day
Thursday, Oct. 25 – City Council Meeting
Monday, Oct. 29 – Daylight Saving Time Ends
Wednesday, Oct 31 – Halloween

Glossary of Terms

Caisson: A column made of steel or concrete, which serves as the foundation for a rigid offshore platform rig. A steel or concrete chamber that surrounds equipment below the waterline of an arctic submersible rig, thereby protecting the equipment from damage by moving ice.

Gravel Island and Gravel Berm: Provides a work surface in shallow water to support the main facilities for drilling oil and gas. The outside of the island is formed by a steel sheetpile wall. The inside is filled with gravel and sand. A gravel berm runs around the outside of the steel sheetpile wall to protect the gravel island from winter ice and summer storms.

LEOS®: LEOS® is a leak detection system developed by Siemens Germany, The LEOS® is an oxygen-filled pipe that sits adjacent to the oil and gas pipelines. Should a leak develop in the oil or gas lines, hydrocarbon fluids will seep into the LEOS® pipe, signaling an alert. LEOS® is designed to detect leaks as small as one barrel per day and to pinpoint the location to within a few feet.

Ice Rubble Field: A rough, inherently unstable field of ice where ridges have formed, or areas of ice have been pushed perpendicular to the main ice direction, but have not consolidated. It is not uncommon for unstable rubble fields or collars to form around offshore structures.

Smart Pigs: Scrubbing and scraping devices called "pigs" reduce build-up of waxes and other contaminants along the pipe's interior. Smart pigs are sophisticated and sensitive in-line inspection tools that travel through the pipe, measuring and recording irregularities that may represent corrosion, cracks, laminations, deformations (dents, gouges, etc.), or other defects.

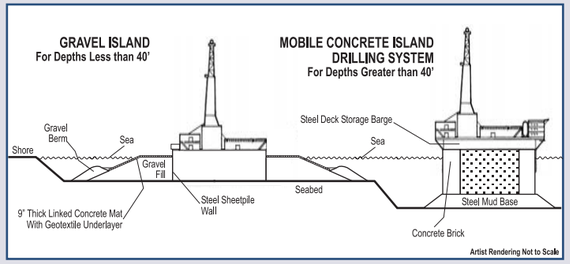
PREPARED UNDER CONTRACT TO:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

PREPARED BY: EDAW | AECOM

EDAW, Inc.
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
For Comments Please Contact:
Barbara Bamberger
Email. bambergerb@cox.net
Ph. (619) 232-2988 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

MMS ensures that the oil industry employs the best available technologies, monitors facility conditions, and seeks continuous improvement based on best practices and new advances. **Prevention of a spill is the ideal.** Production facilities must function safely in their environmental conditions, whether in shallow water with land-fast ice, or deep water with multiyear ice. Below is a diagram of the facilities for different depths.



Gravel Island and Mobile Concrete Island Drilling System (CIDS)

The most typical and cost-effective design for the relatively shallow land-fast ice zone involves gravel islands. This newsletter covers how shallow water facilities and deep water facilities work. A glossary of terms can be found on the last page.

Shallow Water Facilities

Gravel islands are man-made and specifically designed to allow safe oil production in Arctic conditions. Numerous features make it possible for them to withstand the region's extremely strong ice, wind, and water movement.

Gravel Island

Generally mined onshore and transported by trucks using ice roads, gravel is placed, compacted, graded and shaped to **maximize its strength**. Northstar's gravel island, for example, is 690 feet long and 590 feet wide with a work surface of about five acres.

Gravel islands are sited and oriented based on location-specific conditions to **minimize the exposure** of production facilities. Facilities and oil wells are located at the center or leeward side of the island.

The **production facility itself resists ice movement** enough to reduce the risk of facility failure. Erosion that can reduce a gravel island's protection is controlled by a replenishable gravel berm (or mound) at the base. The slope most exposed to waves and currents is protected with interconnecting concrete blocks from 20 feet below the island to six feet above sea level. The blocks are linked by stout chains and secured by heavy anchors.

Beyond the island's elevated rim, a gravel bench covered with concrete mats **reduces wave energy**, increases resistance to ice override, and induces natural formation of an ice rubble field. This prevents override from reaching the facilities. At Northstar, the buffer extends 75 feet beyond the perimeter. Beyond that, a 15- to 30-foot wall of vertical steel pile prevents wave or ice impacts from even 100-year-storm events.

Each oil well also has an **automatic shut-off valve** at least 1,500 feet below the ocean floor so that oil can be confined in the event of a leak. In the rare case where a shut-off valve fails, its design ensures that it shuts itself into a closed position, thus preventing leakage from the reservoir below. The pipes can also be manually turned off.

Alarms alert offshore personnel to any number of changing conditions so they can monitor and take timely action, if needed.

Pipelines are designed to resist both external and internal forces. Automatic valves at each end control flow and can isolate any incident. They are buried beneath the ocean floor to keep them safe from ice gouges and other dangers. At Northstar, geological surveys determined a burial depth of seven feet to be safe.

Pipelines are monitored at least every three years with internal "smart pigs" to detect damage, corrosion, or displacement. At Northstar, electrical current is used to inhibit rusting and corrosion.

Pipelines are fitted with leak detection systems, in case something happens to go wrong. The system at Northstar can detect a leak of less than one-third of a barrel (14 gallons) per day and pinpoint its location to within 100 feet along six miles of buried pipeline. The LEOS® instrument can even detect vapors near a pipeline to signal even smaller leaks. The LEOS® works year-round and weather conditions do not in any way affect its ability to detect spills.

"LEOS" ®

Smart-Pig Tool

Verification and enforcement are extensive. Offshore design specifications are carefully checked by MMS staff and specially retained engineering firms before construction is approved. Inspection continues during construction, installation, and operation. At Northstar, routine inspections occur several times a year.

Seven distinct stipulations are added to lease sale terms and are enforceable. Discussed in detail in the third newsletter, these include bowhead whale monitoring, conflict avoidance agreements with whalers, and protection of biological resources.

Deep Water Facilities

To date, there are no deep water (more than 40 feet) production facilities in the Beaufort Sea. To understand how these facilities will be engineered for safety, MMS currently relies on facilities in similar Arctic conditions, such as Sakhalin, a Russian island in the North Pacific, and the Caspian Sea basin bordering Russia. **Two deep water engineering options** have been developed for exploration and production in the Beaufort Sea – the mobile **Concrete Island Drilling Station** (CIDS) and the **Steel Drilling Caisson** (SDC).

Concrete Island Drilling Station (CIDS)

The CIDS was originally **developed specifically for use in the Beaufort Sea** in 1984. It is made up of huge concrete "bricks" 295 feet square and 44 feet high. Several of these bricks can be stacked for various water depths. These sit on a 25-foot steel base on the ocean floor and support an integrated drilling rig high above sea level.

The interlocking structure and massive weight provide **exceptional resistance to natural forces**, thus protecting the facilities from failure. It is specifically designed to resist ice movement.

Another structure known as the SDC also relies on ocean floor contact and ballast weight to **resist ice forces**. A caisson is a column that serves as the foundation for an offshore platform rig. Made of steel or concrete, it surrounds equipment below the waterline of an arctic submersible rig and protects the equipment from damage by moving ice.

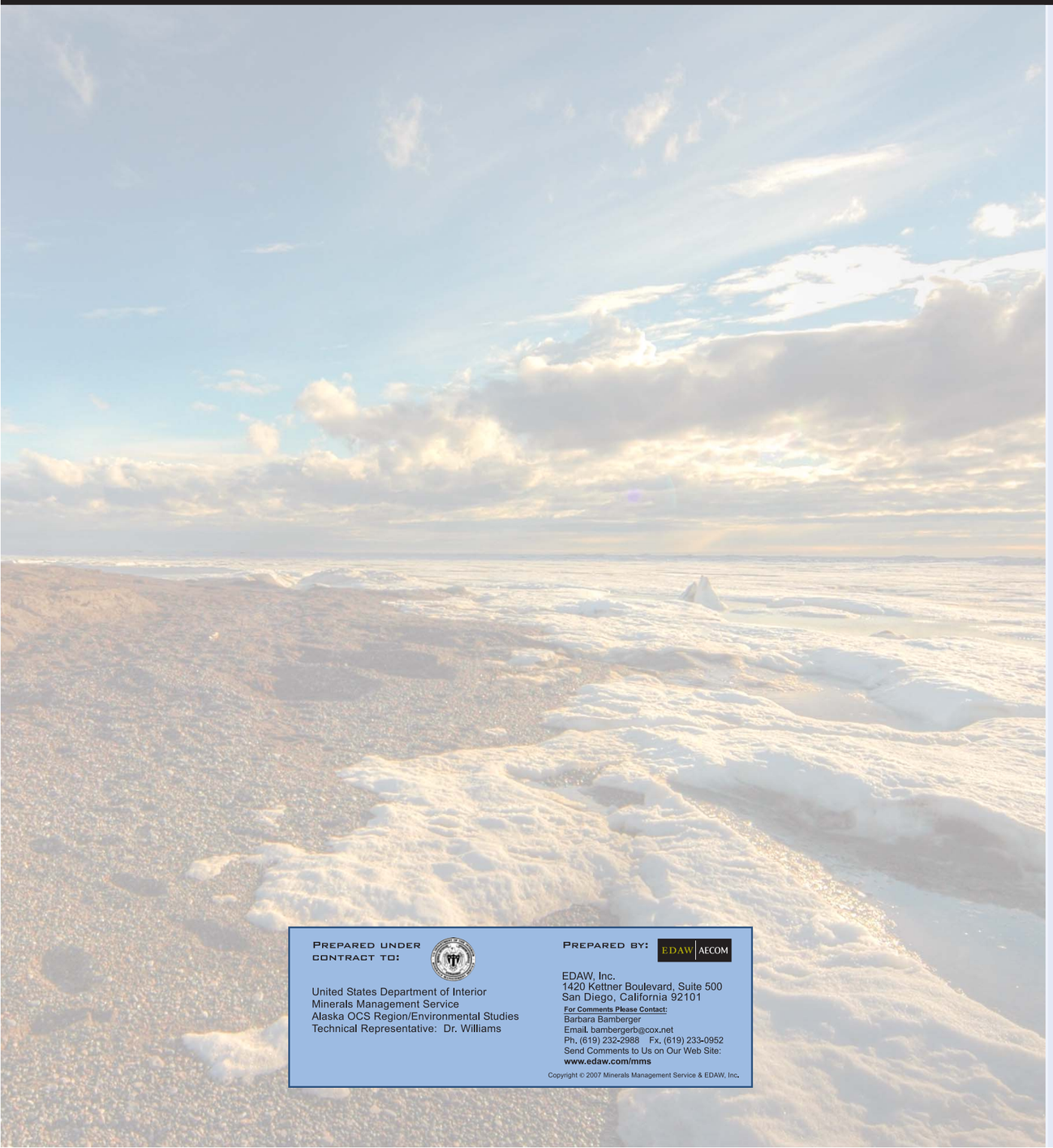
Steel Drilling Caisson (SDC)

In its current configuration, the SDC is 715 feet long and 360 feet wide, and can be used in water from 25 to 80 feet deep. Using a modified tanker for its shell (see photo above), it has been used over two seasons on different sites in the Canadian Beaufort Sea. The SDC has also been **used to successfully drill** five exploration wells in the Alaskan Beaufort Sea.

MMS works to ensure that deep water facilities operate at the same **level of safety** as shallow water facilities. Each site review will determine the type of engineering required to achieve this goal. Finally, pipelines will meet the same stringent requirements as shallow water pipelines, adapted to their specific conditions.

"Outsiders constantly ask if we are 'for' or 'against' oil development. How can anybody be for or against something that remains to be defined?"
(*In This Place*, Kaktovik, Alaska)

OFFSHORE OUTLOOK:
OIL SPILL RESPONSE (REDESIGNED)



PREPARED UNDER CONTRACT TO:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

PREPARED BY: EDAW | AECOM

EDAW, Inc.
1420 Kettner Boulevard, Suite 500
San Diego, California 92101

For Comments Please Contact:
Barbara Bamberger
Email. bambergerb@cox.net
Ph. (619) 232-2988 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

Purpose of "Offshore Outlook"

Residents of the North Slope Borough are deeply concerned about oil production and how it will affect their lives, their livelihood and their country.

While onshore oil production has a history, offshore oil production is still relatively new to the region. Residents' concerns about offshore exploration and production in the Beaufort Sea fall into three primary categories. These concerns are the basis for a series of three newsletters.

MMS is continuously assessing detection and clean-up technology. It has developed extensive preparation plans and set up a system to respond in the case of a spill. These plans must be in place before a lease can be approved.

North Slope residents have asked for more information on how oil spill response is carried out and who, locally, is involved. This newsletter begins to address the concerns expressed by North Slope residents.

- Oil production facility engineering –
  How can offshore facilities survive the harsh conditions?
- Oil spill response –
  What happens if something goes wrong?
- Impacts and benefits –
  What is the community's risk and what does it gain?

"We care about the impacts of oil development because we were here before oil and we will be here after oil."
(**North Slope Borough Mayor Itta,** North Slope News, March 2007).

"Industry has not yet developed a fail-safe means of cleaning up the Beaufort Sea if a spill occurs"
(OCS EIS/EA MMS 2003-01)

Voices from the Community: Concerns about Oil Spill Response

Demonstrate an effective method for responding to and cleaning up an oil spill in Arctic waters, given the harsh climate, especially during broken ice conditions.

Assure that the lack of Arctic experience cleaning up spills will not put our livelihoods, our culture, and one of the most sensitive areas of North America at great risk.

Acknowledge that techniques and equipment tested onshore or offshore in other regions may not be effective in the Beaufort Sea.

Understand that any risk is too much risk. Even a small spill would be significant, likely affecting the entire ecosystem.

"Productive marine ecosystems, marine mammals, sea birds, and coastal communities are all at risk from potential blowouts and pipeline oil spills. Even small amounts of oil can negatively affect marine life."
(OCS EIS/EA MMS 2003-01)

Key questions regarding oil spills in the Beaufort Sea include how can spills be detected under various ice conditions, who will respond to spills and what planning have they done, and what do containment and clean-up technologies look like.

Detection of Spills

Industry is primarily **responsible for preventing spills**, with MMS and the State as regulatory agencies overseeing the process. Detection is the first step. As mentioned in the first newsletter, technology has improved such that a LEOS® can detect vapors from very minor pipeline spills and works year round, even in the worst weather conditions. Weather does not affect its ability to detect a spill.

But what if an oil spill occurs under ice – can an oil spill be detected under sea ice? **The answer is yes**; LEOS® works under ice. Further, research shows that ground-penetrating radar and ultra-sensitive ethane sensors can detect oil under ice[1]. In a study conducted in March 2006, a full-scale test in Norway proved that radar can quickly map oil under ice from the surface; it can also map oil that is buried under snow that is on top of ice[2]. Automatic shut-off safety valves, as mentioned in the first newsletter, are present at least 1,500 feet below the ocean floor.

In the Event of a Spill: Planning and Response

A system has been established by all federal, state, and local agencies, to deal with oil spill response in the North Slope region. In the case of an actual or potential spill, a Unified Command system is activated, whether an incident occurs onshore or offshore. For offshore events the Coast Guard takes on those duties. This system allows the federal, state, and local governments in the North Slope to participate in the spill response.

The North Slope Subarea Plan **requires companies** to develop an oil spill response plan consistent with the Unified and North Slope Subarea plans. These plans require operators to maintain equipment and staging areas in a high state of readiness. If an operator fails to demonstrate this, the MMS and the State of Alaska can impose work-stop orders or seasonal drilling restrictions.

A North Slope Regional Multiagency Coordination Committee (MAC) will be activated to advise the Unified Command and provide recommendations on cleanup priorities, objectives, and on the action plan; **traditional knowledge** is part of the MAC.

A select group of contractors is **already on-call** in case of a spill. Alaska Clean Seas (ACS) is a non-profit cooperative whose members include oil and pipeline companies. ACS provides oil spill management and response training, research and development, and day-to-day response support[3].

Response Support

ACS has a fleet of responder boats, barges and skimmers. They work with local responders such as LCMF LLC., located in Alpine and Barrow. LCMF provides local response teams to ACS and the North Slope Borough. As with ACS, LCMF's experience is limited to onshore spills but both are trained and prepared for offshore spills.

Implementation of Response

Spill response is organized around 5 functions: Command, Planning, Operations, Logistics, Finance and Administration. This is called a "Unified Command Structure". For the North Slope, the command must include coordinators from all local, Federal, and State agencies, as well as the entity responsible for the spill[4]. Led by an "Incident Commander", this person is in charge of control, containment, removal, and disposal of the spill.

Conclusion

This newsletter describes the state-of-the-art in detection, response, containment and clean up that will minimize impacts in the event of an oil spill. It identifies responding entities and how they work. However, if spills occur and clean-up is not perfect, the community may suffer.

The next newsletter in the series will deal with the issue of the community's risks from a leak, spill or blowout, as well as the ways those risks are minimized and offset by certain benefits.

North Slope News

The North Slope Borough is hosting an oil and gas forum on September 20 and 21, 2007, in Barrow. This gathering is intended to bring together high-level decision-makers and other key personnel in a search for solutions that accommodate multiple stakeholder positions.

Upcoming events:

September 2007
Thursday, Sept. 27 – City Council Meeting

October 2007
Thursday, Oct. 18 – Alaska Day
Thursday, Oct. 25 – City Council Meeting
Monday, Oct. 29 – Daylight Saving Time Ends
Wednesday, Oct 31 – Halloween

Glossary of Terms

Absorbents: The property of some liquids or solids to soak up oil or other fluids.

In situ burning: The burning off of oil in the original location or position of a spill

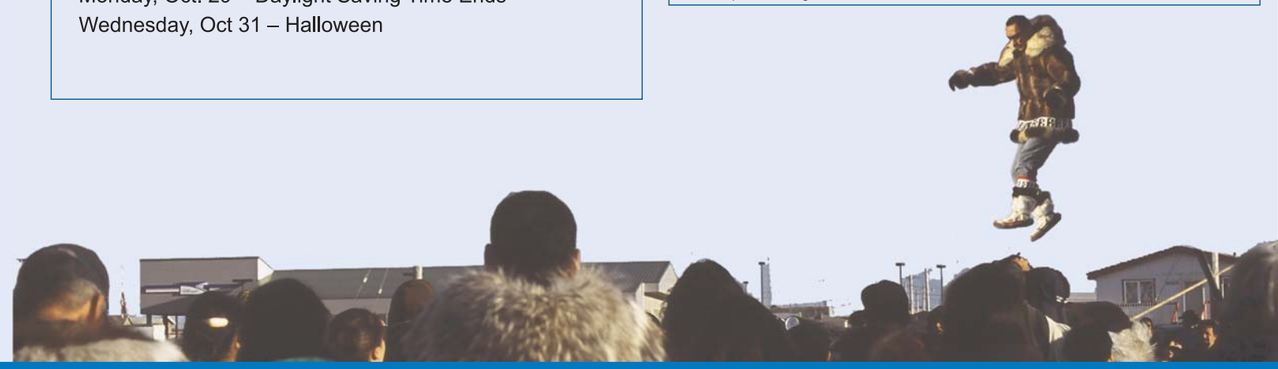
LEOS®: A leak detection system developed to detect leaks as small as one barrel per day and to pinpoint the location to within a few feet.

Surfactants: A chemical that acts as a surface active agent. This term encompasses a multitude of materials that function as emulsifiers, dispersants, oil-wetters, water-wetters, foamers and defoamers.

Viscosity: The thickness or resistance to flow of a liquid. Generally, viscosity of a liquid decreases as temperature increases.

Endnotes:

1 For more details, see www.mms.gov/tarprojects/517.htm
2 For more details on the Norway Spill study, see www.mms.gov/tarprojects/569.htm
3 Responder contracting list can be found at www.dec.state.ak.us/spar/ipp/docs/racname.pdf
4 The North Slope Subarea Contingency Plan is found at www.akrrt.org/NSplan/nstoc.shtml
5 For spills occurring on state lands or waters, the State of Alaska standard is 72 hours.



> ***"If they can't clean up the Exxon Valdez spill in a much milder climate, we want to know how they can do it under the ice in the Arctic Ocean?"***
>
> Robert Thompson, Inupiat whaler from Kaktovik, AP 4/19/2007

Ramp up procedures follows a 4-day (96-hour) **maximum timeline** for instigation of a full response team for any incident impacting federal lands and waters[5]. Requirements are specific and change with elapsed time:

0-6 Hours

During the first 6-hours, all federal, state and local agencies **must be notified** including the North Slope Borough's Police, Fire Department and Emergency Service Coordinators. This initial group is primarily responsible for containment equipment mobilization.

This group also determines the source of the spill if possible, identifies the responsible party, and begins to gather data to **formulate a response strategy**. If there is an immediate threat to public health and safety, action shall be initiated, and if needed, evacuation may be implemented according to the NS Borough Comprehensive Emergency Management Plan. Staging areas have been identified for each community and remote facilities in the North Slope Subarea have been determined.

6-96 Hours

After the "Initial Response Team" reveals the scope and size of the spill, the Unified Command **will begin to form**. From the 6 – 96th hour, appropriately trained personnel will be assigned as Section Chiefs for Operations, Planning logistics, and Administration/Finance.

96+ Hours (4 Days)

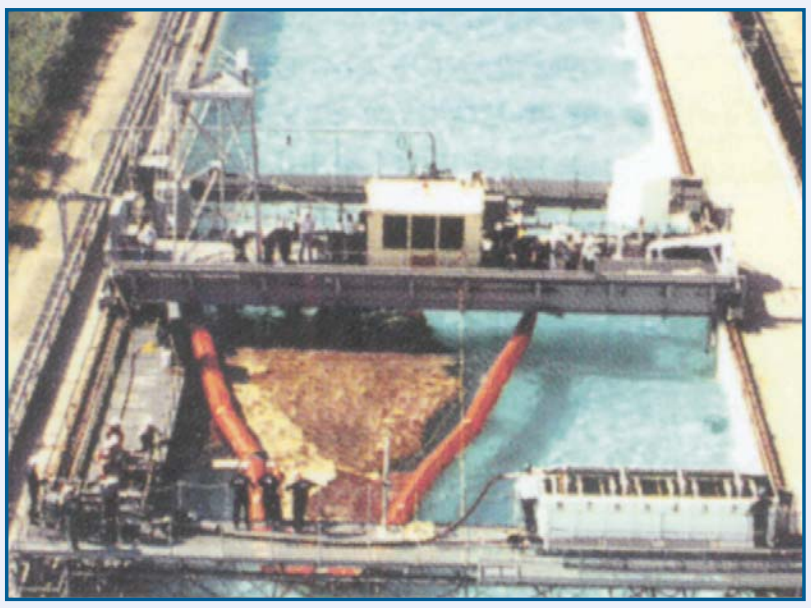
By the 96 hour mark, **the full team is assembled** and containment/cleanup is well under way. Planning and operations address recovery and protection, emergency response, air operations, wildlife, technical specialties, documentation, and demobilization. The Logistics command deals with communications, medical and food supplies, facilities, vessel support, and ground support. Finance addresses procurement of spill equipment, claims and compensation, and clean up costs.

Containment and Clean Up

Any decision regarding the use of dispersants and/or in situ burning in the North Slope will be made by the Federal and State on scene coordinators in consultation with the Alaska Regional Response Team (ARRT), which includes **local representatives**.

While there are no legal obligations for the ARRT to include the North Slope Borough in the decision making process regarding local use of dispersants and / or in-situ burning, the **ARRT includes the concerns** of the North Slope to the extent practicable.

Sensitive areas must be considered by the Regional Response Team in determining where and when dispersant use is appropriate in the North Slope Subarea.

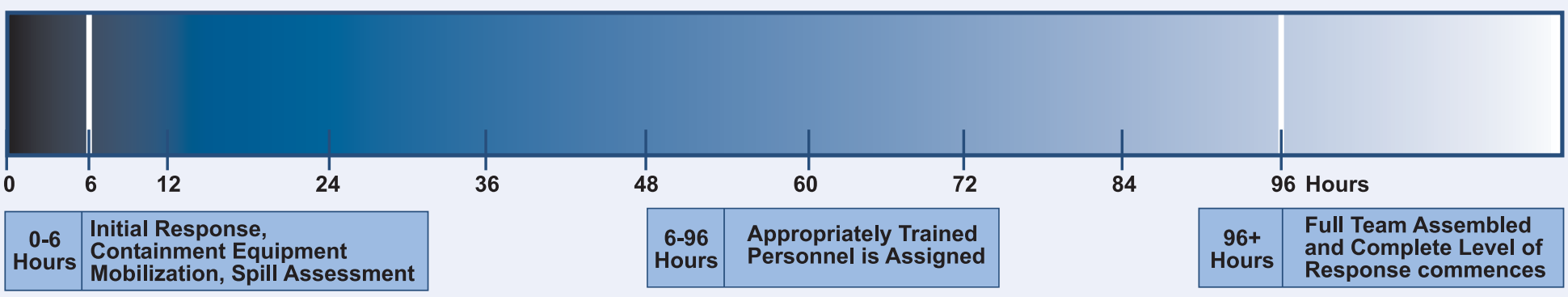


Containment boom and skimmer being tested with oil at the National Oil Spill Response test facility

Equipment **staging areas have been identified** for each community and remote facilities in the North Slope Subarea have been determined. ACS and its member companies own more than $50,000,000 in equipment. This includes more than 300,000 feet of containment boom, 175 skimmers, 96 vessels, 14 barges, tanks and bladders, and more.

Conventional clean up techniques include:

- Containment booms
- Mechanical recovery (skimming/scooping)
- Burning
- Absorbents (on-shore response)
- Dispersants (off-shore, deep water response)
- Surfactants (off-shore response)
- Ice techniques (for arctic response)
- Enhanced biodegradation (assists decomposition)



Containment and cleanup are **always based on the specific conditions** surrounding a particular spill. In the Arctic, three seasons affect conditions: solid ice, open water, and broken ice.

Solid Ice

This season allows **the best prospects for oil recovery**. Cleanup typically mimics an on-shore response, with mobilization of heavy equipment, such as bulldozers and front-end loaders, directly into the spill area.

Semi-solid oil would likely become a thick mat on top of the ice. Snow is an excellent absorbent and could be mixed with the oil to form mulch, making it possible to **handle a large volume of oil quickly and safely**. Any oil that leaked under the ice might be forced into thick pools or natural concavities, permitting removal through drilled holes or containment trenches.

Drilling in solid ice conditions

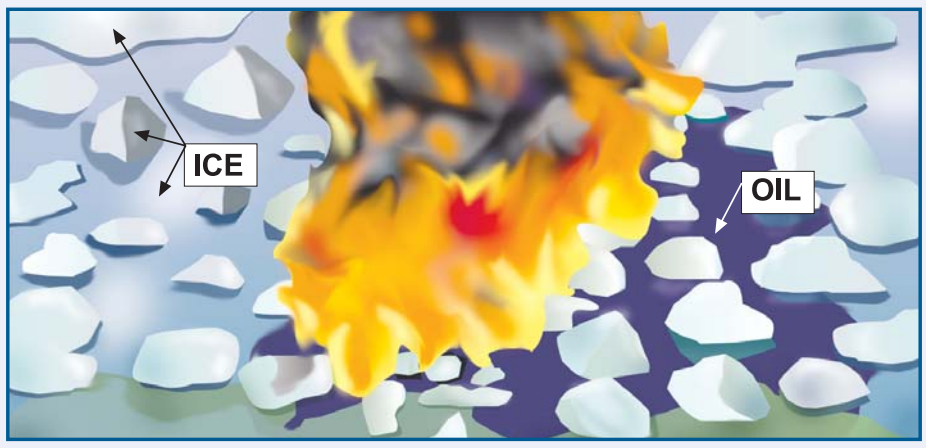
Research shows that oil spilled under stable land-fast ice in the Beaufort Sea **will not spread** more than a few hundred feet because under-ice current is low and storage capacity is high. As ice melts in spring, remnant oil naturally rises to the surface and cleanup may resume.

Open Water

During this season, near freezing temperatures of the Arctic Ocean present a problem for some aspects of cleanup, but help reduce other challenges. For example, cold reduces the efficiency of some skimming devices because the oil is more viscous. On the other hand, **increased viscosity helps limit oil dispersion**. Oil slicks in cold water typically spread several hundred times less than in warm water.

Containment booms tend to be the first equipment mobilized for an open water spill and the last to be removed. They help concentrate the oil for skimming and **keep it out of sensitive areas**. Options for skimming oil include a weir, belt, disc, or rope mop.

Burning, when appropriate, is also **more effective** with thicker oil. Recent field studies show burning can remove more than 90% of slicks in open water.



In situ burn experiment in cold water and broken ice conditions

Broken Ice

Two seasons, **spring and autumn**, present the most challenges for clean up. Demonstrations and drills have shown that mechanical skimmers and other traditional response equipment, when used without modification, are much less effective in broken ice.

During freeze-up (autumn), once ice crystals begin to form, skimming systems lose effectiveness. The preferred response is to trap oil in the ice for extraction after freeze-up is complete (winter). For this reason, the offshore Northstar facility may not pursue new drilling during freeze up (from June to November).

During break up (spring), broken ice conditions are still problematic, but ice fragments create a natural containment, thus enhancing burn-off or modified skimming operations.

Example of skimming operations in broken ice - 2002

Research and field experiments have **led to great improvements**. For example, in July 2002, ACS successfully demonstrated clean up in ice that was 70% broken. Field tests also established skimming equipment limits in ice that was 10% to 30% broken, improving maneuverability and eliminating the need for multiple support vessels.

OFFSHORE OUTLOOK:
COMMUNITY IMPACTS AND BENEFITS
(REDESIGNED)

Offshore Outlook

Volume 1 No. 3

Community Impacts and Benefits

Purpose of "Offshore Outlook"

Residents of the North Slope Borough are deeply concerned about oil production and how it will affect their lives, their livelihood, and their country.

While onshore oil production has an established history, offshore oil production is still relatively new to the region. Residents' concerns about offshore exploration and production in the Beaufort Sea fall into three primary categories seen to the right. These concerns are the basis for a series of three newsletters.

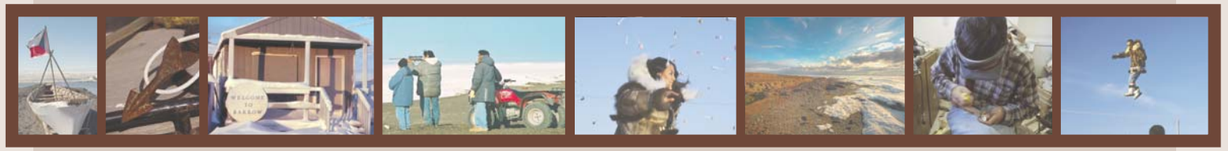
This newsletter considers the risks to the Beaufort Sea and the North Slope Borough, weighed against the benefits of a domestic source of oil and the revenue - direct and indirect - from it.

The sections below begin an ongoing dialogue to address concerns expressed by North Slope residents on community impacts and benefits.

- Oil production facility engineering
  How can offshore facilities survive the harsh conditions?
- Oil spill response
  What happens if something goes wrong?
- Impacts and benefits
  What is the community's risk and what does it gain?

"We care about the impacts of oil development because we were here before oil and we will be here after oil."

(**North Slope Borough Mayor Itta,** North Slope News, March 2007).



"Alaska shoulders more risk than any other state in the U.S. and the Beaufort sale areas constitute some of the riskiest acreage proposed for leasing." (OCS EIS/EA MMS 2003-01)

Voices from the Community: Impacts and Benefits

Federal regulation of offshore oil development that may work elsewhere is inadequate to protect Arctic subsistence whaling, seal hunting and fishing.

It seems that the local population (and our environment) bears virtually all of the risk of offshore oil development, yet receives very little benefit.

Revenue sharing, or impact assistance, is the exception rather than the rule, and is wholly insufficient to compensate for our actual and potential losses.

There is no way to avoid some impacts and effects on bowhead whaling - impacts which will be critical to us but of little consequence to an oil-hungry nation.

Conclusion

This newsletter discusses the risks to the Beaufort Sea and the North Shore Borough weighed against the benefits of developing a domestic source of oil from the Beaufort Sea. It describes OCS revenue flow to local communities as well as the steps taken to avoid and/or minimize the risks.

Through ongoing dialogue, MMS hopes to improve communication on technical issues and facilitate a better understanding of OCS development activities planned for the North Slope.

North Slope News

The North Slope Borough is hosting an oil and gas forum on September 20 and 21, 2007, in Barrow. This gathering is intended to bring together high-level decision-makers and other key personnel in a search for solutions that accommodate multiple stakeholder positions.

Upcoming events:

September 2007
Thursday, Sept. 27 – City Council Meeting

October 2007
Thursday, Oct. 18 – Alaska Day
Thursday, Oct. 25 – City Council Meeting
Monday, Oct. 29 – Daylight Saving Time Ends
Wednesday, Oct 31 – Halloween

Glossary of Terms

Conflict Avoidance Agreement: An agreement established between the Alaska Eskimo Whaling Commission and the oil company with an offshore lease, facilitated through the lease agreement with MMS.

Deferral areas: Areas that are established as 'no-drill' zones for a significant period of time for various reasons ranging from the area's environmental sensitivity, its importance as a migration pathway, or for its relevance as a whaling area.

OCS Revenue: Disbursements are made to states on a monthly basis as royalties, rents, bonuses and other revenues are collected by MMS. A state is entitled to a share of the mineral revenues collected from federal lands located within that state's boundaries. States producing federal offshore tracts adjacent to their seaward boundaries receive 27 percent of those mineral royalties. Remaining offshore revenues collected by the Minerals Management Service are deposited in various accounts of the U.S. Treasury, with the majority of those revenues going to the General Fund. Alaska received $22.9 million in FY 2005 from offshore revenue.

Land and Water Conservation Fund (LWCF): The LWCF receives OCS revenue, which goes to the National Park Service. State and Federal Agencies use LWCF funds to buy parks and recreation areas and to help plan, acquire, and develop land and water areas for recreation use.

Lease Stipulations: A method used to ensure compliance with federal regulations of OCS. Lease stipulations are a form of mitigation and are added to lease terms and are therefore enforceable as part of the lease sale. Seven lease stipulations are included in this newsletter; an example is the conflict avoidance agreement between whalers and lease holder, which was required in the last two lease sales.

National Historic Preservation Fund (NHPF): These funds provide matching grants to States and Territories, which, in turn, must award 10 percent of its annual NHPF allocation to local governments. NHPF funded projects may include: identifying and nominating properties to the National Register of Historic Places, protecting NRHP-listed properties and districts affected by federally funded or licensed construction projects; reviewing and recommending to the National Park Service historic preservation certification.

[1] Stipulations include:
Stipulation 1- Protection of Biological Resources
Stipulation 2- Orientation Program
Stipulation 3- Transportation of Hydrocarbons;
Stipulation 4- Industry Site-Specific Bowhead Whale-Monitoring Program
Stipulation 5- Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence-Harvesting Activities
Stipulation 6- Pre-Booming Requirements for Fuel Transfers
Stipulation 7- Lighting of Lease Structures to Minimize Effects to Spectacled and Steller's Eiders

For a complete list of stipulations and more information, see:
www.mms.gov/alaska/cproject/beaufortsale/FNOS195Package/FNOS195package.htm

PREPARED UNDER CONTRACT TO:

United States Department of Interior
Minerals Management Service
Alaska OCS Region/Environmental Studies
Technical Representative: Dr. Williams

PREPARED BY:

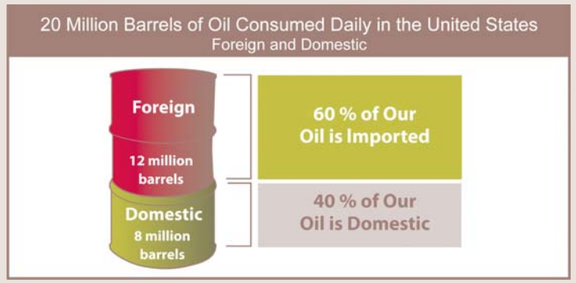
EDAW, Inc.
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
For Comments Please Contact:
Barbara Bamberger
Email. bambergerb@cox.net
Ph. (619) 232-2988 Fx. (619) 233-0952
Send Comments to Us on Our Web Site:
www.edaw.com/mms

MMS continuously develops and refines conditions for offshore oil production **to avoid and minimize impacts**. The facts are that producing the oil is essential, but the unique Arctic environment must be protected. MMS recognizes the concerns over impacts to subsistence hunting in the very areas where whales and other species migrate and local residents hunt.

The National Perspective

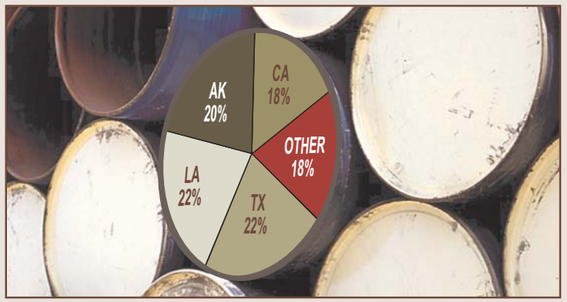
The United States Minerals Management Service (MMS) has the responsibility of **protecting the natural resources** of the outer continental shelf (OCS) while managing its mineral resource development – including oil and gas. MMS also distributes revenues generated by lease fees, royalties and bonuses, as required by law, to states, localities and tribes, as well as to the nation.

The U.S. is the **world's largest** producer, consumer, and net importer of energy. The nation currently produces about 8 million barrels of oil per day, but consumes more than 20 million barrels per day. That shortfall means that more than 60% of our oil must be imported.



Public consensus holds that reducing dependence on foreign energy supplies is **a national priority**. Domestic sources of oil are critical to our nation's security and well being. The current world situation, notably political instability in the Middle East, drives this point home.

Proven domestic oil reserves (both onshore and offshore) are **overwhelmingly concentrated** in just four states: Texas (22%), Louisiana (22%), Alaska (20%), and California (18%).



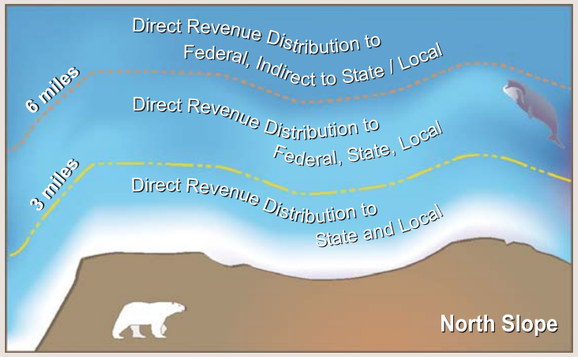
> *"Even if there are no spills, production causes year-round impacts"*
> OCS EIS / EA MMS

Domestic production enhances national security, reduces foreign debt, creates high-paying jobs, reduces inflationary pressures, and improves general economic activity in the areas in which it takes place. Benefits also flow directly to state and local governments, as well as their constituents, from the billions of dollars leasing programs generate annually. If large volumes are produced, even greater revenues are generated through royalties and corporate taxes. These funds are used to pay for government services, schools, and reduce the need for taxes.

Revenue Sharing

In Alaska, MMS's offshore leasing program has already generated **more than $6 billion** in Federal revenues.

On average, about two-thirds of the revenue goes to the general fund of the U.S. Treasury to help pay for government programs and services. Where offshore oil and gas activity is occurring within a 3 to 6 mile area offshore, 27% of all revenue from Federal OCS leasing is captured by the State and, in the case of Alaska, **distributed to Alaska residents** through the permanent fund. Waters from the shoreline to three miles out is under state jurisdiction. Waters beyond 6 miles are under Federal jurisdiction.



OCS Distribution of Revenue

In Alaska, fifty percent (50%) goes to the **Alaska Permanent Fund Account**, 0.5% goes to the school fund and 49.5 % (excluding 49.5% from rental payments) go to the Alaska Constitutional Budget Reserve Fund. The 49.5% from rental payments goes to Alaska's Unrestricted General Fund.

The remaining one-third of the federal revenues is provided to one of two funds. In the past, the Land and Water Conservation Fund (www.ahrinfo.org) helped federal, state and local governments acquire and develop parklands and recreational projects, though revenues from this source has been held up the past few years.

Between 70% and 90% provided in the past to the **Land and Water Conservation Fund** are from OCS mineral revenues. Alaska has received more than $29.8 million from this fund.

The other fund is the National Historic Preservation Fund to help **protect and preserve** our nation's cultural heritage. More than $700 million contributed to this fund has come from OCS mineral revenues.

Here are some totals that have been provided to the state of Alaska for various uses.

Fund Appropriation	Total in Millions
Outer Continental Shelf Lands Act Section 8(g) Disbursements	$510
Coastal Impact Assistance Appropriations	$12.2
Land and Water Conservation Fund	$28.9
National Historic Preservation Fund	$10.6
Tribal Preservation Fund	$02.4
GRAND TOTAL	$564 Million

Protection of Subsistence Whaling

While revenues can **provide benefits** to the North Slope Borough are beneficial, money cannot offset any potential (some say inevitable) impacts on subsistence whaling and the environment. For that reason, MMS works with states and local communities to develop and implement *enforceable* lease stipulations.

MMS, in conjunction with the North Slope Borough (NSB), Alaska Eskimo Whaling Commission (AEWC), and other local organizations, has introduced **seven leasing stipulations** relating to the Beaufort Sea and incorporated into Lease Sale 195 and 202[1]. These include requirements related to protection of the Beaufort Sea's biological resources, transportation of oil, increased requirements for fuel transfers (one of the more vulnerable times for spill potential), and lighting requirements to reduce impacts on migrating eiders. Two stipulations are particularly noteworthy due to their relevance to subsistence hunting:

Bowhead Monitoring

Stipulation 4 requires any offshore operator of seismic surveys or drilling to conduct a site-specific monitoring program for bowhead whales to help **control potential disruption during migration**.

> *"We bear all of the risks and receive very little of the benefit. This raises significant questions of fundamental fairness and environmental justice."*
> (OCS EIS / EA MMS 2003-01)


Juvenile Bowhead Whale in the Beaufort Sea

Conflict Avoidance

Stipulation 5 requires offshore operators to meet with local communities and AEWC to **resolve disagreements** and prevent unreasonable conflicts. Before MMS issues permits, operators must show that they have undertaken cooperative planning to ensure there are no unmitigated impacts on subsistence activities involving marine mammals. This stipulation has led to the creation of "Conflict Avoidance Agreements" between operators and whalers to provide, for example, logistical support to whaling at Cross Island.

In cases where existing stipulations do not adequately mitigate significantly adverse impacts to subsistence hunting, **MMS is committed** to working with local leadership to develop additional or alternative measures.

With **every lease sale** in the Beaufort Sea, MMS evaluates alternatives that include specially protected zones (deferral areas) from the lease sale area in order to reduce environmental impacts. The size and boundaries of these deferral areas is determined during each lease sale; changes may result from new scientific information, new technologies, new priorities for national energy development, or changes in subsistence hunting needs within a given lease sale. For example, during the 2002 exploratory operation at the McCovey prospect, operators shut down the drilling rig during seasonal whale migration.

The North Slope Borough **is a cooperating agency** on any Environmental Impact Statement for proposed post-lease activities in the Beaufort Sea. MMS conducts vigorous inspections to ensure compliance, mitigation measures, and other operating requirements, and shares the resulting information with local leadership in the North Slope. For example, in April 2004, an NSB representative accompanied the MMS inspection team to the Northstar facility. MMS continuously monitors activities and implements additional mitigation measures as appropriate.