Appendix 1.

Agencies, organizations, and people who were consulted about the environmental effects of the Shell EP.
MMS DISTRIBUTION LIST FOR SHELL’S EXPLORATION PLAN

Governor Sarah Palin
P.O. Box 110001
Juneau, Alaska 99811-0001

Don Perrin
State of Alaska
Department of Natural Resources
Office Project Management Permitting
550 W. 7th Ave, Suite 705
Anchorage, Alaska 99501-3559

Ben A. Greene
State of Alaska
Department of Natural Resources
Alaska Coastal Zone Management Program
550 W. 7th Ave., Suite 705
Anchorage, Alaska 99501-3559

Leon C. Lynch
State of Alaska
Department of Natural Resources
Northern Alaska Area, Division of Mining, Land, and Water
3700 Airport Way
Fairbanks, Alaska 99709-4699

Kathleen Sheehan-Dugan
State of Alaska
Department of Natural Resources
550 W. 7th Ave, Suite1260
Anchorage, Alaska 99501-3557

Mark Fink
State of Alaska
Department of Fish & Game
333 Raspberry Road,
Anchorage, Alaska 99518

Stefanie Ludwig
State of Alaska
Department of Natural Resources
Office of History and Archaeology,
550 W. 7th Ave. Suite 1310,
Anchorage Alaska 99501-3565

Patty Burns
DNR, Division of Geological and Geophysical Surveys
3354 College Road
Fairbanks, Alaska 99709

Lydia M. Miner
State of Alaska
Department of Environmental Conservation
Division of Spill Prevention and Response (SPAR)
555 Cordova St.
Anchorage, Alaska 99501-2617

Alan Kukla
State of Alaska
Department of Environmental Conservation
Division of Water
555 Cordova St.
Anchorage, Alaska 99501

Gary Mendivil
State of Alaska
Department of Environmental Conservation
410 Willoughby Ave., Ste 303
P.O. Box 11800
Juneau, Alaska 99811-1800

Commissioner's Office
State of Alaska
Department of Environmental Conservation
410 Willoughby Ave., Ste 303
Juneau, Alaska 99801

Bill Walker
State of Alaska
Department of Environmental Conservation
Air Permits Program
Division of Air Quality
410 Willoughby Ave., Ste 303
Juneau, Alaska 99801

Sharmon Stambaugh
State of Alaska
Department of Environmental Conservation
Division of Water
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Juneau, Alaska 99801

Bruce Campbell
State of Alaska
Department of Transportation and Public Facilities
2301 Peger Road
Fairbanks, Alaska 99709
North Slope Borough  
Dept of Wildlife Management  
P.O. Box 69  
Barrow, Alaska 99723

Tom Lohman  
North Slope Borough  
Department of Wildlife Management  
4011 Winchester Loop  
Anchorage, Alaska 99507

Honorable Lon Sonsalla  
Mayor of Kaktovik  
PO Box 27  
Kaktovik, Alaska 99747

Mr. Isaac Akootchook, President  
Native Village of Kaktovik  
PO Box 130  
Kaktovik, Alaska 99747

Honorable Karl Brower  
Mayor of Nuiqsut  
PO Box 89148  
Nuiqsut, Alaska 99789

Mr. Leonard Lampe, Sr., President  
Native Village of Nuiqsut  
PO Box 89169  
Nuiqsut, Alaska 99789

Ms. Maggie Ahmaogak  
Executive Director Alaska Eskimo Whaling Commission  
PO Box 570  
Barrow, Alaska 99723

Mr. Arnold Brower, Jr., President  
Inupiat Community of the Arctic Slope  
P.O. Box 934  
Barrow, Alaska 99723

Honorable Martha Whiting  
Mayor of the Northwest Arctic Borough  
P.O. Box 1110  
Kotzebue, Alaska, 99752

Honorable George Kingik  
Mayor of Point Hope  
P.O. Box 169  
Point Hope, Alaska 99766-0169

Honorable John Hopson, Jr.,  
Mayor of Wainwright  
P.O. Box 9  
Wainwright, Alaska 99782

Honorable Elizabeth Hollingsworth  
Mayor of Atqasuk  
P.O. Box 91119  
Atqasuk, Alaska 99791

Lanston Chinn  
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825 West 8th Ave., Suite 206  
Anchorage, Alaska 99501

Brian Boyd  
Kuukpik  
825 W. 8th Ave, Suite 206  
Anchorage, Alaska 99501

Gordon Brown  
Kuukpik Subsistence Oversight Board  
P.O. Box 89187  
Nuiqsut, Alaska 99789

Isaac Nukapigak, President  
Kuukpik Corporation  
P.O. Box 89187  
Nuiqsut, Alaska 99789

Judith Brady  
State of Alaska  
Alaska Oil and Gas Conservation Commission  
121 W. Fireweed Lane, Suite 207  
Anchorage, Alaska 99503-2035

Audubon Alaska  
715 L Street, Suite 200  
Anchorage, Alaska 99501

Eleanor Huffines  
The Wilderness Society  
430 W. 7th Ave. #210  
Anchorage, Alaska 99501-3550

Northern Alaska Environmental Center  
830 College Road  
Fairbanks, Alaska 99708

Trustees for Alaska  
1026 W. 4th Ave., Suite 201  
Anchorage, Alaska 99501
Government to Government Meeting 1/29/07 Native Village of Kaktovik

Tribal council representatives:
- Eddie Rexford
- Susie Akootchook
- George Kaleak
- Fenton Rexford
- Roy Akootchook
- Ida
- Carla

MMS:
- Jeff Walker, Regional Supervisor, FO
- Albert Barros, Community Liaison

AEWC:
- Dorcas Rock

The NV Kaktovik received the Shell EP on 1/22/07.

Will there be consultation for the on ice seismic?
Where is the seismic activity going to occur? It will be closer to Prudhoe Bay.

It was stated that the SSCD was the only type of rig that can be used in the Beaufort. So, how can these proposed ships (Frontier Discoverer & Kulluk) be used?

What kind of contact has there been with allotment holders near Flaxman Island?

When reviewing the maps of the proposed area there was a concern expressed about the helicopter route near shore. Suggested that it be moved further south on shore to avoid spooking the caribou and the oogarook.

One of the council members recounted how sportsman hunting and recreation are impacting subsistence harvesting. A cub airplane was circling while they were hunting. Brought up the need to protect other subsistence harvesting besides bowhead whales.

The tribe and/or MMS needs a computer program that transcribes the human voice for note taking.

Action item: Susie would like to see tapes of offshore activities (off shore report) pertaining to Hurricane Katrina.
Appendix II

Assumptions for the Analysis of Accidental Oil Spills in this EA. For purposes of this EA analysis, no large spills or very large crude oil spills are assumed from exploration activities. This assumption is based on the low rate of exploratory drilling blowouts per well drilled and the history of exploration spills on the Arctic OCS discussed below. It is likely a small spill could occur. For purposes of analysis we chose a 48 bbl fuel transfer spill as identified in Shell Offshore Inc.’s Beaufort Sea Oil Discharge Prevention and Contingency Plan Summary of Potential Discharges.

Table II-1 shows the Shell Offshore Inc. Beaufort Sea Outer Continental Shelf Lease Exploration Plan 2007 - 2009 summary of fuel supply information in Table 13b on page 49.

Table II-1 Diesel Fuel Oil Supply Vessel

<table>
<thead>
<tr>
<th>Size of Fuel Supply Vessel</th>
<th>Capacity of Fuel Supply Vessel</th>
<th>Frequency of Fuel Transfers</th>
<th>Route Fuel Supply Vessel Will Take</th>
</tr>
</thead>
<tbody>
<tr>
<td>400-foot length</td>
<td>150,000 bbls</td>
<td>Once per season</td>
<td>Vessel will transit from South Alaska, following coastline</td>
</tr>
</tbody>
</table>

Modeling Simulations of Oil Weathering. To judge the effect of an oil spill, we estimate information regarding how much oil evaporates, how much oil is dispersed and how much oil remains after a certain time period. We derive the weathering estimates of diesel fuel oil from modeling results from the SINTEF Oil Weathering Model (OWM) Version 3.0 (Reed et al., 2005) for up to 30 days. Table I-2 summarizes the results we assume for the fate and behavior of a 48 bbl diesel fuel spill.

Table II-2 Fate and Behavior of a Hypothetical 48-Barrel Diesel Fuel Oil Spill

<table>
<thead>
<tr>
<th>Time After Spill in Hours</th>
<th>Summer Spill</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Oil Remaining (%)</td>
<td>96</td>
</tr>
<tr>
<td>Oil Dispersed (%)</td>
<td>3</td>
</tr>
<tr>
<td>Oil Evaporated (%)</td>
<td>1</td>
</tr>
<tr>
<td>Thickness (mm)</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Note: For the EA the assumed spill size is a 48 bbl diesel spill

Notes:
Calculated with the Sintef oil-weathering model Version3.0 of Reed et al. (2005) and assuming diesel fuel no 2.

Summary of Potential Discharges
Oil spills are an issue of great public concern in relation to the offshore oil and gas industry. Table II-3 shows the Shell Offshore Inc. Beaufort Sea Oil Discharge Prevention and Contingency Plan summary of potential discharges in Table 2-1 on page 2-17.
### Table II-3 Summary of Potential Discharges

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CAUSE</th>
<th>PRODUCT</th>
<th>SIZE</th>
<th>DURATION</th>
<th>PREVENT/POTENTIAL DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer from fuel barge to drill rig</td>
<td>Hose rupture</td>
<td>Diesel</td>
<td>Approximately 2,000 gallons (48 bbl) (Section 1.6)</td>
<td>5.5 minutes</td>
<td>Transfer procedures in place; Note: This scenario will be addressed as part of USCG approval of Vessel Response Plans by individual vessel owners.</td>
</tr>
<tr>
<td>Diesel</td>
<td>Tank rupture</td>
<td>Diesel</td>
<td>1,555 bbl</td>
<td>Minutes to hours</td>
<td>Note: The diesel tanks are internal to each drilling vessel rather than deck-mounted, where the potential for marine spills is much greater. As a result, a scenario involving tank rupture has not been included in the oil spill response plan, but will be monitored as part of an ongoing tank inspection program.</td>
</tr>
<tr>
<td>Blowout</td>
<td>Uncontrolled flow at the mudline</td>
<td>Crude oil</td>
<td>287,100 bbl including emulsion and free water</td>
<td>30 days (Section 1.0)</td>
<td>Blowout prevention equipment and related procedures for well control.</td>
</tr>
</tbody>
</table>

**Historical Exploration Spills on the Beaufort and Chukchi Outer Continental Shelf and Canadian Beaufort.** The MMS estimates the chance of a large (≥1,000 bbl) oil spill from exploratory activities to be very low. On the Beaufort and Chukchi OCS, the oil industry drilled 35 exploratory wells. During the time of this drilling, industry has had 35 small spills totaling 26.7 bbl or 1,120 gallons (gal). Of the 26.7 bbl spilled, approximately 24 bbl were recovered or cleaned up. Table II-4 shows the exploration spills on the Beaufort and Chukchi OCS. Small (25 bbl or less) operational spills of diesel, refined fuel, or crude oil may occur. The MMS estimates this could be a typical scenario during exploratory drilling in the Beaufort and Chukchi seas. These small spills often are onto containment on platforms, facilities or gravel islands or onto ice and may be cleaned up. One large exploration spill occurred in the Canadian Beaufort Sea from an exploration well site when the island eroded during a storm and a facility tank was damaged spilling approximately 2,440 bbls of diesel P-50 fuel oil (Hart Crowser, Inc., 2000).

**Historical Exploration Blowouts: Information on the Beaufort, Chukchi and U.S. Outer Continental Shelf and Canadian Beaufort.** No exploratory drilling blowouts have occurred on the Alaskan OCS. Since 1971-2005, industry has drilled approximately 172 exploration wells in the Pacific OCS, 51 in the Atlantic OCS, 13,142 in the Gulf of Mexico OCS, and 98 in the Alaska OCS, for a total of 13,463 exploration wells. From 1971-2005, there were 66 blowouts during exploration drilling. Four exploration blowout oil spills, 200, 100, 11, and 0.8 bbl, respectively, have occurred from drilling those wells (Table II-3). No large spills (≥1,000 bbl) have occurred from 1971-2005 during exploration drilling. Therefore, approximately 13,000 wells have been drilled, and four spills resulted in crude reaching the environment from blowouts during exploration. The U.S. Gulf of Mexico OCS exploration drilling blowout frequencies as reported by Holland (1997) are 5.9 x 10⁻³ blowouts per well drilled.
One exploration drilling blowout of gas has occurred on the Canadian Beaufort. Up to 1990 85 exploratory wells have been drilled in the Canadian Beaufort Sea and 1 shallow gas blowout has occurred. A second incident was not included at the Amaluligak wellsite with the Molikpaq drill platform. This resulted in a gas flow through the diverter, with some leakage around the flange. The incident does not qualify as a blowout by the definition used in other databases and therefore was excluded (Devon Canada Corporation, 2004).

The blowout record for the Alaska North Slope remains the same as previously reported in USDOI, MMS (2003) and is summarized. Of the 10 blowouts, 9 were gas and 1 was oil. The oil blowout in 1950 resulted from drilling practices that would not be relevant today. A third study confirmed that no crude oil spills ≥ 100 bbl from blowouts occurred from 1985-1999 (Hart Crowser, Inc., 2000). Scandpower (2001) used statistical blowout frequencies modified to reflect specific field conditions and operative systems at Northstar. This report concludes that the blowout frequency for drilling the oil-bearing zone is 1.5 x 10^-5 per well drilled. This compares to a statistical blowout frequency of 7.4 x 10^-5 per well (for an average development well). This same report estimates that the frequency of oil quantities per well drilled for Northstar for a spill greater than (> 130,000 bbl is 9.4 x 10^-7 per well.

Previous Analysis of Very Large and Large Accidental Oil Spills. The chance of a very large spill (≥ 150,000) is very low, but its potential effects were analyzed in USDOI, MMS (2003) Section IV.1 Low-Probability, Very Large Oil Spill. The spill scenario was based on a 15,000 bbl flow-rate for 15 days totaling 225,000 bbl. In the unlikely event of a very large accidental oil spill the potential for significant impacts exist as was identified in USDOI, MMS (2003). No new significant effects are identified from this proposal. A summary of conclusions is provided in Appendix III.

The chance of a large spill is low (≥ 1,000), but the potential consequences were analyzed in USDOI, MMS (2003) section IV.C. and USDOI, MMS (2006). For purposes of analysis MMS assumed 1,500 bbl diesel or crude oil spill from a facility or a 4,600 bbl crude oil spill from a pipeline. The conditional probabilities estimated by the OSRA model (expressed as percent chance) of a spill ≥ 1,000 bbl contacting environmental resource areas or land segments within a given time frame from launch areas (LA 1-18) and pipeline segments (P 1-11) are discussed in USDOI, MMS (2003), USDOI, MMS (2004) or USDOI, MMS (2006). In the unlikely event of a large accidental oil spill the potential for significant impacts exist as identified in USDOI, MMS (2003) or USDOI, MMS (2006). No new significant effects are identified from this proposal. The conditional probabilities (expressed as percent chance) from Launch Area (LA) 10, 15, 17 and 18 (USDOI, MMS 2003 Tables A2-1 – A2-54 and A2-73-A2-90) are generally representative of the lease blocks cited in the Shell Offshore Inc. Beaufort Sea Outer Continental Shelf Lease Exploration Plan 2007 – 2009 (Figure II-1). The chance of a large spill contacting assuming a large spill occurs is summarized specifically for the LAs 10, 15, 17, and 18 and is inclusive in the conditional probability discussions in USDOI, MMS (2003), USDOI, MMS (2004) or USDOI, MMS (2006) cited above.
Summer Conditional Probabilities
Probabilities in the following discussion, unless otherwise noted, are summer conditional probabilities estimated by the OSRA model (expressed as percent chance) of a spill ≥1,000 bbl contacting environmental resource areas (ERA) or land segments (LS) within a given time frame from LAs 10, 15, 17 or 18 (USDOI, MMS, 2003: Tables A2-19, A2-20, A2-21, A2-25, A2-26, A2-27 and A2-85-A2-87).

3 Days
The OSRA model estimates a <0.5-24% chance of a spill ≥1,000 bbl contacting ERAs 29-37 (mean distance from coast of migration corridor). The chance of contacting ERA 6 (Cross and No Name Islands) is <0.5 %. The chance of contacting ERAs 15-16 (Arey and Barter Islands, Bernard, Jago and Tapkaurak Spits) is <0.5-5%. The chance of contacting ERA 43 (Nuiqsut Subsistence Area) is <0.5-1%. The chance of contacting ERA 44 (Kaktovik Subsistence Area) is <0.5-20%. The chance of contacting ERA 69 (Harrison Bay/Colville Delta) is <0.5-2%. The chance of contacting ERA 3 (Thetis and Jones Islands) is <0.5-7%. The chance of contacting individual LSs 46 (Arey Island, Barter Island) 47 (Kaktovik) or 48 (Griffin Point, Oruktalik Lagoon) is <0.5-3%. The chance of contacting LS 43-51 (Arctic National Wildlife Refuge) is <0.5-14%.

10 Days
The OSRA model estimates a <0.5-24% chance of a spill ≥1,000 bbl contacting ERAs 29-37 (mean distance from coast of migration corridor). The chance of contacting ERA 6 (Cross and No Name Islands) is <0.5-1 %. The chance of contacting ERAs 15-16 (Arey and Barter Islands, Bernard, Jago and Tapkaurak Spits) is <0.5-11%. The chance of contacting ERA 43 (Nuiqsut Subsistence Area) is <0.5-5%. The chance of contacting ERA 44 (Kaktovik Subsistence Area) is <0.5-26%. The chance of contacting ERA 69 (Harrison Bay/Colville Delta) is <0.5-8%. The chance of contacting ERA 3 (Thetis and Jones Islands) is <0.5-16%. The chance of contacting individual LSs 46 (Arey Island, Barter Island) 47 (Kaktovik) or 48 (Griffin Point, Oruktalik Lagoon) is <0.5-7%. The chance of contacting LS 43-51 (Arctic National Wildlife Refuge) is <0.5-36%.

30 Days
The OSRA model estimates a <0.5-35% chance of a spill ≥1,000 bbl contacting ERAs 29-37 (mean distance from coast of migration corridor). The chance of contacting ERA 6 (Cross and No Name Islands) is <0.5-4 %. The chance of contacting ERAs 15-16 is <0.5-15%. The chance of contacting ERA 43 (Nuiqsut Subsistence Area) is <0.5-9%. The chance of contacting ERA 44 (Kaktovik Subsistence Area) is <0.5-33%. The chance of contacting ERA 69 (Harrison Bay/Colville Delta) is <0.5-16%. The chance of contacting ERA 3 (Thetis and Jones Islands) is <0.5-23%. The chance of contacting individual LSs 46 (Arey Island, Barter Island) 47 (Kaktovik) or 48 (Griffin Point, Oruktalik Lagoon) is <0.5-12%. The chance of contacting LS 43-51 (Arctic National Wildlife Refuge) is <0.5-49%.

Winter Conditional Probabilities
Probabilities in the following discussion, unless otherwise noted, are winter conditional
probabilities estimated by the OSRA model (expressed as percent chance) of a spill ≥1,000 bbl contacting environmental resource areas or land segments within a given time frame from launch areas (LA) 10, 15, 17 or 18 (USDOI, MMS, 2003: Tables A2-37, A2-38, A2-39, A2-43, A2-44, A2-45 and A2-73-75).

3 Days
The OSRA model estimates a <0.5-7% chance of a spill ≥1,000 bbl contacting ERAs 29-37 (mean distance from coast of migration corridor). The chance of contacting ERA 6 (Cross and No Name Islands) is <0.5%. The chance of contacting ERAs 15-16 (Arey and Barter Islands, Bernard, Jago and Tapkaurak Spits) is <0.5-1%. The chance of contacting ERA 43 (Nuiqsut Subsistence Area) is <0.5%. The chance of contacting ERA 44 (Kaktovik Subsistence Area) is <0.5-3%. The chance of contacting ERA 69 (Harrison Bay/Colville Delta) is <0.5%. The chance of contacting ERA 3 (Thetis and Jones Islands) is <0.5-1%. The chance of contacting individual LSs 46 (Arey Island, Barter Island) 47 (Kaktovik) or 48 (Griffin Point, Oruktalik Lagoon) is <0.5-1%. The chance of contacting LS 43-51 (Arctic National Wildlife Refuge) is <0.5-3%.

10 Days
The OSRA model estimates a <0.5-7% chance of a spill ≥1,000 bbl contacting ERAs 29-37 (mean distance from coast of migration corridor). The chance of contacting ERA 6 (Cross and No Name Islands) is <0.5%. The chance of contacting ERAs 15-16 (Arey and Barter Islands, Bernard, Jago and Tapkaurak Spits) is <0.5-2%. The chance of contacting ERA 43 (Nuiqsut Subsistence Area) is <0.5-1%. The chance of contacting ERA 44 (Kaktovik Subsistence Area) is <0.5-3%. The chance of contacting ERA 69 (Harrison Bay/Colville Delta) is <0.5-1%. The chance of contacting ERA 3 (Thetis and Jones Islands) is <0.5-3%. The chance of contacting individual LSs 46 (Arey Island, Barter Island) 47 (Kaktovik) or 48 (Griffin Point, Oruktalik Lagoon) is <0.5-1%. The chance of contacting LS 43-51 (Arctic National Wildlife Refuge) is <0.5-7%.

30 Days
The OSRA model estimates a <0.5-8% chance of a spill ≥1,000 bbl contacting ERAs 29-37 (mean distance from coast of migration corridor). The chance of contacting ERA 6 (Cross and No Name Islands) is <0.5%. The chance of contacting ERAs 15-16 (Arey and Barter Islands, Bernard, Jago and Tapkaurak Spits) is <0.5-3%. The chance of contacting ERA 43 (Nuiqsut Subsistence Area) is <0.5-1%. The chance of contacting ERA 44 (Kaktovik Subsistence Area) is <0.5-4%. The chance of contacting ERA 69 (Harrison Bay/Colville Delta) is <0.5-2%. The chance of contacting ERA 3 (Thetis and Jones Islands) is <0.5-3%. The chance of contacting individual LSs 46 (Arey Island, Barter Island) 47 (Kaktovik) or 48 (Griffin Point, Oruktalik Lagoon) is <0.5-2%. The chance of contacting LS 43-51 (Arctic National Wildlife Refuge) is <0.5-11%.
### Table II-4.
**Exploration Spills on the Arctic OCS**

<table>
<thead>
<tr>
<th>Lease No</th>
<th>Sale Area</th>
<th>Operator</th>
<th>Date</th>
<th>Time 24 Hr</th>
<th>Facility</th>
<th>Substance</th>
<th>Amt (Gal)</th>
<th>Cause of Spill</th>
<th>Response Action</th>
<th>Amount Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>0344</td>
<td>71</td>
<td>Sohio</td>
<td>7/22/1981</td>
<td>11:00</td>
<td>Mukluk Island</td>
<td>Diesel</td>
<td>0.50</td>
<td>Leaking line on portable fuel trailer</td>
<td>Sorbents used to remove spill. Contaminated gravel removed.</td>
<td>0.05</td>
</tr>
<tr>
<td>0344</td>
<td>71</td>
<td>Sohio</td>
<td>7/22/1981</td>
<td>14:00</td>
<td>Mukluk Island</td>
<td>Diesel</td>
<td>1.00</td>
<td>Overfilled fuel tank on equipment</td>
<td>Sorbents used to remove spill. Contaminated gravel removed.</td>
<td>1.00</td>
</tr>
<tr>
<td>0280</td>
<td>71</td>
<td>Exxon</td>
<td>8/7/1981</td>
<td>14:00</td>
<td>Beaufort Sea I</td>
<td>Hydraulic Fluid</td>
<td>1.00</td>
<td>Broken hydraulic line on ditch witch.</td>
<td>Fluid picked up with shovels.</td>
<td>1.00</td>
</tr>
<tr>
<td>0280</td>
<td>71</td>
<td>Exxon</td>
<td>8/8/1981</td>
<td>14:00</td>
<td>Beaufort Sea I</td>
<td>Trans. Fluid</td>
<td>0.25</td>
<td>Overfilling of transmission fluid.</td>
<td>Fluid picked up and placed in plastic bags.</td>
<td>0.25</td>
</tr>
<tr>
<td>0280</td>
<td>71</td>
<td>Exxon</td>
<td>1/11/1982</td>
<td>10:00</td>
<td>Beaufort Sea I</td>
<td>Hydraulic Fluid</td>
<td>0.50</td>
<td>Broken hydraulic line.</td>
<td>Fluid picked up and stored in plastic bags.</td>
<td>0.50</td>
</tr>
<tr>
<td>0280</td>
<td>71</td>
<td>Exxon</td>
<td>1/11/1982</td>
<td>14:00</td>
<td>Alaska Beaufort Sea I</td>
<td>Diesel</td>
<td>3.00</td>
<td>Overfilled catco 90-3 tank.</td>
<td>Fluid picked up.</td>
<td>3.00</td>
</tr>
<tr>
<td>0280</td>
<td>71</td>
<td>Exxon</td>
<td>1/17/1982</td>
<td>10:00</td>
<td>Beaufort Sea I</td>
<td>Diesel</td>
<td>1.00</td>
<td>Tank on catco 90-14 overfilled.</td>
<td>Fluid picked up and stored in plastic bags.</td>
<td>1.00</td>
</tr>
<tr>
<td>0280</td>
<td>71</td>
<td>Exxon</td>
<td>1/21/1982</td>
<td>10:00</td>
<td>Beaufort Sea I</td>
<td>Hydraulic Fluid</td>
<td>0.25</td>
<td>Broken hydraulic line on ditch witch.</td>
<td>Fluid picked up.</td>
<td>0.25</td>
</tr>
<tr>
<td>0371</td>
<td>71</td>
<td>Amoco</td>
<td>3/16/1982</td>
<td>10:00</td>
<td>N/A Sandpiper Gravel Island</td>
<td>Unknown</td>
<td>1.00</td>
<td>Seeping from Gravel Island.</td>
<td>Sorbent pads.</td>
<td>Unknown</td>
</tr>
<tr>
<td>0849</td>
<td>87</td>
<td>Union Oil</td>
<td>9/4/1982</td>
<td>14:00</td>
<td>Canmar Explorer II</td>
<td>Unknown</td>
<td>1.00</td>
<td>Transfer of test tank from drillship to barge.</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>0871</td>
<td>87</td>
<td>Shell</td>
<td>9/5/1982</td>
<td>18:55</td>
<td>Canmar Explorer II</td>
<td>Light Oil</td>
<td>0.50</td>
<td>Washing down cement unit, drains not plumbed to oil/water separator.</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td>Shell</td>
<td>9/14/1982</td>
<td>19:00</td>
<td>Canmar II Drillship</td>
<td>Diesel</td>
<td>30.00</td>
<td>Tank vent overflowed during fuel transfer.</td>
<td>Deployed sorbent pads and pump.</td>
<td>30.00</td>
</tr>
<tr>
<td>0191</td>
<td>BF</td>
<td>Exxon</td>
<td>11/11/1982</td>
<td>10:00</td>
<td>Beechey Pt. Gravel Is.</td>
<td>Lube Oil</td>
<td>1.00</td>
<td>Loader tipped over lube oil drum</td>
<td>Oil cleaned up with sorbents. Contaminated gravel removed.</td>
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</tr>
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<td>BF</td>
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<td>1/15/1983</td>
<td>10:00</td>
<td>Beechey Pt. Gravel Is.</td>
<td>Diesel</td>
<td>0.12</td>
<td>Fuel truck spilled diesel as it climbed a 40 degree ramp to island</td>
<td>Sorbents used and contaminated gravel removed.</td>
<td>0.12</td>
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<td>BF</td>
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<td>8/29/1983</td>
<td>6:30</td>
<td>Beechey Pt. Gravel Is.</td>
<td>Hydraulic Fluid</td>
<td>0.20</td>
<td>Hydraulic line on backhoe broke</td>
<td>Spill contained on island surface. Sorbents used and contaminated gravel removed.</td>
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<td>Ice Road to Tern Island</td>
<td>Hydraulic Fluid</td>
<td>10.0</td>
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<td>2/26/1985</td>
<td>17:30</td>
<td>Beechey Pt. Gravel Is.</td>
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<td>BF</td>
<td>Shell</td>
<td>3/3/1985</td>
<td>1:30</td>
<td>Ice Road to Tern Island</td>
<td>Hydraulic Fluid</td>
<td>3.00</td>
<td>Hydraulic line broke</td>
<td>Unknown</td>
<td>3.00</td>
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<td>BF</td>
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<td>3/2/1985</td>
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<td>Beechey Pt. Gravel Is.</td>
<td>Gasoline</td>
<td>0.01</td>
<td>Operational Spill</td>
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<td>4/1/1985</td>
<td>1:30</td>
<td>Beechey Pt. Gravel Is.</td>
<td>Waste Oil</td>
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<td>Drum of waste oil punctured</td>
<td>Snow recovered.</td>
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<td>BF</td>
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<td>4/1/1985</td>
<td>15:30</td>
<td>Tern Gravel Island</td>
<td>Crude Oil</td>
<td>1.00</td>
<td>Well Separator overflowed, crude oil escaped</td>
<td>Line boom deployed</td>
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Table II-4 (Continued)
Exploration Spills on the Arctic OCS

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<th>Date</th>
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<th>Facility</th>
<th>Substance</th>
<th>Amt. (Gal)</th>
<th>Cause of Spill</th>
<th>Response Action</th>
<th>Amount Recovered</th>
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<td>Tern Gravel Island</td>
<td>Crude Oil</td>
<td>15.00</td>
<td>Test burner was operating poorly</td>
<td>Containment Boom deployed</td>
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<td>BF</td>
<td>Shell</td>
<td>9/24/1985</td>
<td>16:00</td>
<td>Tern Gravel Island</td>
<td>Crude Oil</td>
<td>2.00</td>
<td>Oil released from steam heat coil when Halliburton tank moved</td>
<td>Sorbents and hand shovel used</td>
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<td>BF</td>
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<td>10/4/1985</td>
<td>8:45</td>
<td>Enroute to Tern Gravel Island</td>
<td>Jet fuel B</td>
<td>80.00</td>
<td>Wire sling broke during helicopter transport of fuel blivits</td>
<td>Contaminated Snow Removed, Test holes drilled with no fuel below snow.</td>
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<td>Test oil burner malfunction</td>
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<td>Test oil burner malfunction</td>
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<td>AMOCO</td>
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<td>2:00</td>
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<td>Hydraulic line rupture</td>
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<td>Beaufort Kulluk</td>
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<td>9/24/1993</td>
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<td>Fuel</td>
<td>4.00</td>
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<td>3 gallons on deck of barge recovered, none in sea</td>
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<td>13:00</td>
<td>SSDD/MAT</td>
<td>Gear oil</td>
<td>220.0</td>
<td>Helicopter sling failure during transfer of drums to SSDD</td>
<td>Scooped up contaminated snow and ice</td>
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<td>Ice Road to Tern Island</td>
<td>Diesel, Hydraulic Fluid</td>
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<td>Truck went through ice; fuel line ruptured</td>
<td>Scooped up contaminated snow and ice. Some product entered water</td>
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Table II-5
Number of Blowouts per Year in the Gulf of Mexico and Pacific OCS Regions

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<th>Year</th>
<th>Number of Blowouts</th>
<th>Total with Condensate/Oil</th>
<th>Amount of Condensate/Oil (Barrels)</th>
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<th>Drilling</th>
<th>Workover/Completion</th>
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<th>Year</th>
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<th>Amount of Condensate/Oil (Barrels)</th>
<th>Production</th>
<th>Drilling</th>
<th>Workover/Completion</th>
<th>Wells Drilled</th>
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Source:
Bibliography


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USDOI, MMS. 2002. Biological Evaluation of the Potential Effects of Oil and Gas Leasing and Exploration in the Alaska OCS Beaufort Sea and Chukchi Sea Planning Areas on Endangered Bowhead whales (Balaena mysticetus), Fin Whales (Balaenoptera physalus), and Humpback Whales (Megaptera novaeangliae). Anchorage, AK: USDOI, MMS, Alaska OCS Region.


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Figure 1. Beaufort Sea area showing the -30 meter isobath and the leases listed in Shell Oil's exploration plan, and Shell's Sivullig Prospect.
Figure 2. Beaufort Sea area showing the -30 meter isobath, the leases in the plan held by Shell Oil between Cross Island and the Canadian border, and the Location of Previous Wells in Camden Bay.
Figure 3. Shell's Kullu drilling vessel, which is the former Kulluk.
Figure 4. Shell's Frontier Discoverer drillship
Figure 5. The Vladimir Ignatyuk icebreaker, which was formerly the Arctic Kalvik.
Figure 6. The Kapitan Dranitsyn icebreaker.
Figure 7. The geotechnical coring vessel, *Fugro Explorer*. 
Figure 8. Beaufort Sea area showing proposed drill sites and all bowhead sightings in the years 1982 - 2005.
Figure 9: Dates of Bowhead Whale Sightings, 1982 to 2005 for a Restricted Area of the Beaufort Sea.
Figure 10. Depth of Bowhead Whale Sightings, 1982 to 2005 for a Restricted Area of the Beaufort Sea.
Figure 11. Beaufort Sea area showing previous drill sites and all bowhead sightings in the years 1985, 1986, 1992 and 1993.
Figure 12 Bowhead Whale Harvest Locations Near Cross Island. Sources: Long (1996); North Slope Borough Planning Dept. (1993); Bowhead Strikes 1937-2001
Figure 13. Bowhead Whale Harvest Locations near Kaktovik

Sources: Kaleak (1996); North Slope Borough Planning Dept. (1993); North Slope Borough (2001).
Figure 14. Acoustic levels during the 1993 Kuvlum operations in very light ice (Hall et al., 1994). The figure illustrates that, in spite of the open water conditions and relative inactivity of the icebreakers, the 120 dB isopleth at a depth of 20m extended to the shoreline.
Figure 15. Bowhead sightings near the Kuvlum drill site. (This is a portion of EA Figure 17 and of Figure 9 in Brewer et al., 1993.)
Figure 16. 1993 Bowhead whale sighting distribution from aerial sighting in the Distant and Proximal survey areas. This is a copy of Figure 9 in Hall et al., 1994.
Figure 17. Bowhead sightings near the Corona drilling and icebreaking operation during the middle and final stages of the 1985 migration in moderate ice. (This is a combination of Figs. 27 and 28 in McLaren et al. (1986).)
Figure 18. Aerial sightings of bowhead whales near the 1986-Hammerhead operations during the middle and final portions of the migration in mild-ice conditions. (Copy of Fig. 6 in LGL and Greeneridge (1987).)
Figure 19. Sightings and movements of whales in the initial state of the migration through relatively open-water conditions during the 1985-Hammerhead operations. A tug and dredge were operating also during this period at the Erik prospect near the eastern edge of the monitoring grid. (Copy of Figure 26 in McLaren et al. (1986).)
Figure 20. Bowhead sightings near the Galahad drilling and icebreaking operation during the 1991 migration in heavy ice. The whales were sighted on October 2nd during flight number "gal1002" (Gallaher et al., 1992). The two symbols labeled "FV" indicate the location of fishing vessels or subsistence whaling vessels.