1. A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals

Chukchi Sea Site Clearance and Shallow Hazards Surveys

- High resolution multi-channel 2D system, 40 cubic inches (in^3) (4 by 10) airgun array, or similar.

6. Numbers of Marine Mammals that Might be "Taken by Harassment"

Potential Number of "Takes by Harassment"

The area of water potentially exposed to received levels ≥160 dB by the proposed operations was calculated by multiplying the planned trackline distance by the cross-track distance of the sound propagation measured during previous field seasons. For site clearance and shallow hazards surveys in 2008 the Chukchi Sea, the ≥160 dB radius from the *Cape Flattery's* four 10 in^3 airguns measured in 2008 was 1,400 m and the single 10 in^3 airgun was 440 m.

Shallow hazards and site clearance surveys in the Chukchi Sea are planned to occur along ~480 km of survey lines (plus ~120 km of mitigation gun activity between survey lines) from Aug – Sep exposing ~900 km^2 of water to ≥160 dB. *(No change)*

Table 6-7 Estimates of the numbers of marine mammals in areas where maximum received sound levels in the water would be ≥160 dB during Shell's planned site clearance and shallow hazards surveys in summer (Aug) and fall (Sep), 2009 in the Chukchi Sea, Alaska.

	Number of Exposure to Sound Levels ≥160 dB									
	Summer				Fall					
	Open Water [a]		Ice Margin [b]		Open Water [a]		Ice Margin [b]		Total	
Species	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.
Odontocetes										
Monodontidae										
Beluga	1	1	0	0	7	15	2	3	10	19
Delphinidae										
Killer whale	0	0	0	0	0	0	0	0	0	5
Phocoenidae										
Harbor porpoise	4	7	0	1	1	3	0	0	6	11
Mysticetes										
Bowhead whale	0	1	0	0	1	4	0	1	1	5
Fin whale	0	0	0	0	0	0	0	0	0	5
Gray whale	7	14	1	2	10	19	1	2	19	37
Humpback Whale	0	0	0	0	0	0	0	0	0	5
Minke whale	0	0	0	0	0	0	0	0	0	5
Total Cetaceans	12	23	1	3	19	41	3	7	35	93
Pinnipeds										
Bearded seal	12	18	3	4	12	18	5	4	31	43
Ribbon seal	0	0	0	0	0	0	0	0	0	5
Ringed seal	339	528	75	117	227	354	51	79	692	1078
Spotted seal	2	5	1	1	2	5	1	1	6	11
Total Pinnipeds	353	551	79	122	241	376	56	84	730	1138

[a] Open water regions for the Chukchi Sea are considered to be 90% of the survey lines.

[b] Ice Margin regions for the Chukchi Sea are considered to be 10% of the survey lines.

(See assumptions for table below):

Assumptions for preparation of table 6-7:

480 km of 4x10 in^3 operations (full array)
120 km of 1x10 in^3 operations (mitigation gun)
4x10 in^3 160 dB radius = 1400 m
1x10 in^3 160 dB radius = 440 m
50% of trackline completed on or before Aug 31 (summer)
50% of trackline completed after Aug 31 (fall)