APPENDICES TO:

MARINE MAMMAL MONITORING AND MITIGATION DURING SHELL'S ACTIVITIES IN THE CHUKCHI SEA, JULY–SEPTEMBER 2013: DRAFT 90-DAY REPORT

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APPENDIX A: NATIONAL MARINE FISHERIES SERVICE IHA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Incidental Harassment Authorization

Shell Gulf of Mexico Inc., (Shell), 3601 C Street, Suite 1000, Anchorage, Alaska 99503, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1371(a)(5)(D)) and 50 CFR 216.107 to take, by Level B harassment only, small numbers of marine mammals incidental to conducting an open-water marine surveys in the Chukchi Sea, contingent upon the following conditions:

1. This Authorization is valid from July 1 through October 31, 2013.

2. This Authorization is valid only for activities associated with open-water marine surveys and related activities in the Chukchi Sea. The specific areas where Shell's surveys will be conducted are within the Chukchi Sea, Alaska, as shown in Figures 1-1, 1-2, and 1-3 of Shell's IHA application.

3. (a) The species authorized for incidental harassment takings, Level B harassment only, are: beluga whales (*Delphinapterus leucas*); Narwhals (*Monodon monoceros*); harbor porpoises (*Phocoena phocoena*); killer whales (*Orcinus orca*); bowhead whales (*Balaena mysticetus*); gray whales (*Eschrichtius robustus*); humpback whales (*Megaptera novaeangliae*); fin whales (*Balaenoptera physalus*); minke whales (*B. acutorostrata*); bearded seals (*Erignathus barbatus*); spotted seals (*Phoca largha*); ringed seals (*P. hispida*); and ribbon seals (*P. fasciata*).

(b) The authorization for taking by harassment is limited to the following acoustic sources and from the following activities:

(i) 40 in^3 airgun arrays and other acoustic sources for site clearance and shallow hazards surveys;

(ii) Non-airgun active acoustic sources for ice gouge surveys;

(iii) Vessel activities related to open-water marine surveys listed in (i) and (ii); and

(iv) Vessel activities related to equipment recovery and maintenance at Burger A well site.

(c) The taking of any marine mammal in a manner prohibited under this Authorization must be reported within 24 hours of the taking to the Alaska Regional Administrator

(907-586-7221) or his designee in Anchorage (907-271-3023), National Marine Fisheries Service (NMFS) and the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at (301) 427-8401, or his designee (301-427-8418).

4. The holder of this Authorization must notify the Chief of the Permits and Conservation Division, Office of Protected Resources, at least 48 hours prior to the start of collecting seismic data (unless constrained by the date of issuance of this Authorization in which case notification shall be made as soon as possible).

5. Prohibitions

(a) The taking, by incidental harassment only, is limited to the species listed under condition 3(a) above and by the numbers listed in Table 1 (attached). The taking by Level A harassment, injury or death of these species or the taking by harassment, injury or death of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this Authorization.

(b) The taking of any marine mammal is prohibited whenever the required source vessel protected species observers (PSOs), required by condition 7(a)(i), are not onboard in conformance with condition 7(a)(i) of this Authorization.

6. Mitigation

(a) Establishing Exclusion and Disturbance Zones:

(i) Establish and monitor with trained PSOs a preliminary exclusion zone for cetaceans surrounding the airgun array on the source vessel where the received level would be 180 dB (rms) re 1 µPa. For purposes of the field verification test, described in condition 7(e)(i), this radius is estimated to be 160 m from the seismic source for the 40 in^3 airgun arrays and 52 m for a single 10 in^3 airgun for site clearance and shallow hazards surveys.

(ii) Establish and monitor with trained PSOs a preliminary exclusion zone for pinnipeds surrounding the airgun array on the source vessel where the received level would be 190 dB (rms) re 1 µPa. For purposes of the field verification test described in condition 7(e)(i), this radius is estimated to be 50 m from the seismic source for the 640 in^3 airgun arrays and 23 m for the single 10 in^3 airgun for site clearance and shallow hazards surveys.

(iii) Establish and monitor a zone of influence (ZOI) for cetaceans and pinnipeds surrounding the airgun array on the source vessel where the received level would be 160 dB (rms) re 1 µPa. For purposes of the field verification test described in condition 7(e)(i), this radius is estimated to be 1,800 m from the seismic source for the 40 in^3 airgun arrays and 569 m for the single 10 in^3 airgun for site clearance and shallow hazards surveys.

(iv) Establish a ZOI for cetaceans and pinnipeds surrounding the vessel while operating dynamic positioning (DP) thruster where the received level would be 120 dB (rms) re 1 μPa. For purposes of the field verification test described in condition 7(b)(i), this radius is estimated to be 13 km from the DP thruster source for equipment recovery and maintenance operations.

(v) Immediately upon completion of data analysis of the field verification measurements required under condition 7(e)(i) below, the new 120-dB, 160-dB, 180-dB, and 190-dB marine mammal ZOIs and exclusion zones shall be established based on the sound source verification.

(b) Vessel and Helicopter Movement Mitigation:

(i) Avoid concentrations or groups of whales by all vessels under the direction of Shell. Operators of support vessels should, at all times, conduct their activities at the maximum distance possible from such concentrations of whales.

(ii) Vessels in transit shall be operated at speeds necessary to ensure no physical contact with whales occurs. If any vessel approaches within 1.6 km (1 mi) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:

(A) Reducing vessel speed to less than 5 knots within 300 yards (900 feet or 274 m) of the whale(s);

(B) Steering around the whale(s) if possible;

(C) Operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;

(D) Operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and

(E) Checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

(F) Reducing vessel speed to less than 9 knots when weather conditions reduce visibility.

(iii) When weather conditions require, such as when visibility drops, adjust vessel speed accordingly to avoid the likelihood of injury to whales.

(iv) In the event that any aircraft (such as helicopters) are used to support the planned survey, the mitigation measures below would apply:

(A) Under no circumstances, other than an emergency, shall aircraft be operated at an altitude lower than 1,000 feet above sea level (ASL) when within 0.3 mile (0.5 km) of groups of whales.

(B) Helicopters shall not hover or circle above or within 0.3 mile (0.5 km) of groups of whales.

(c) Mitigation Measures for Airgun Operations:

(i) Ramp-up:

(A) A ramp up, following a cold start, can be applied if the exclusion zone has been free of marine mammals for a consecutive 30-minute period. The entire exclusion zone must have been visible during these 30 minutes. If the entire exclusion zone is not visible, then ramp up from a cold start cannot begin.

(B) If a marine mammal(s) is sighted within the exclusion zone during the 30-minute watch prior to ramp up, ramp up will be delayed until the marine mammal(s) is sighted outside of the exclusion zone or the animal(s) is not sighted for at least 15-30 minutes: 15 minutes for small odontocetes (harbor porpoise) and pinnipeds, or 30 minutes for baleen whales and large odontocetes (including beluga and killer whales and narwhal).

(C) If, for any reason, electrical power to the airgun array has been discontinued for a period of 10 minutes or more, ramp-up procedures shall be implemented. Only if the PSO watch has been suspended, a 30-minute clearance of the exclusion zone is required prior to commencing ramp-up. Discontinuation of airgun activity for less than 10 minutes does not require a ramp-up.

(D) The seismic operator and PSOs shall maintain records of the times when ramp-ups start and when the airgun arrays reach full power.

(ii) Power-down/Shutdown:

(A) The airgun array shall be immediately powered down whenever a marine mammal is sighted approaching close to or within the applicable exclusion zone of the full array, but is outside the applicable exclusion zone of the single mitigation airgun.

(B) If a marine mammal is already within the exclusion zone when first detected, the airguns shall be powered down immediately.

(C) Following a power-down, firing of the full airgun array shall not resume until the marine mammal has cleared the exclusion. The animal will be considered to have cleared the exclusion zone if it is visually observed to have left the exclusion zone of the full array, or has not been seen within the zone for 15 minutes (pinnipeds or small toothed whales) or 30 minutes (baleen whales or large toothed whales).

(D) If a marine mammal is sighted within or about to enter the 190 or 180 dB (rms) applicable exclusion zone of the single mitigation airgun, the airgun array shall be shutdown.

(E) Firing of the full airgun array or the mitigation gun shall not resume until the marine mammal has cleared the exclusion zone of the full array or mitigation gun, respectively. The animal will be considered to have cleared the exclusion zone as described above under ramp up procedures.

(F) Power down and shutdown of airgun array requirements prescribed in 6(c)(ii)(A) also applies to situations when an aggregation of 12 or more bowhead whales or gray whales that appear to be engaged in a non-migratory, significant biological behavior (e.g., feeding, socializing) are observed during vessel monitoring within the 160-dB zone of disturbance.

(iii) Poor Visibility Conditions:

(A) If during foggy conditions, heavy snow or rain, or darkness, the full 180 dB exclusion zone is not visible, the airguns cannot commence a ramp-up procedure from a full shut-down.

(B) If one or more airguns have been operational before nightfall or before the onset of poor visibility conditions, they can remain operational throughout the night or poor visibility conditions. In this case ramp-up procedures can be initiated, even though the exclusion zone may not be visible, on the assumption that marine mammals will be alerted by the sounds from the single airgun and have moved away.

(iv) Use of a Small-Volume Airgun during Turns and Transits

(A) Throughout the seismic survey, particularly during turning movements, and short transits, Shell will employ the use of a small-volume airgun (i.e., 10 in3 “mitigation airgun”) to deter marine mammals from being within the immediate area of the seismic operations. The mitigation airgun would be operated at approximately one shot per minute and would not be operated for longer than three hours in duration (turns may last two to three hours for the proposed project).

(B) During turns or brief transits (e.g., less than three hours) between seismic tracklines, one mitigation airgun will continue operating. The ramp-up procedure will still be followed when increasing the source levels from one airgun to the full airgun array. However, keeping one airgun firing will avoid the prohibition of a "cold start" during darkness or other periods of poor visibility. Through use of this approach, site clearance and shallow hazards surveys using the full array may resume without the 30 minute observation period of the full exclusion zone required for a "cold start". PSOs will be on duty whenever the airguns are firing during daylight, during the 30 minute periods prior to ramp-ups.

(d) Mitigation Measures for Subsistence Activities:

(i) Shell shall fully implement the following provisions, as described fully in the 2013 Conflict Avoidance Agreement (CAA) signed between Shell and the AEWC and its representing whaling communities of the Chukchi and Beaufort Seas:

(A) Section 202(a) and (c): Com-Center General Communication Scheme;

(B) Section 204: Standardized Log Books;

(C) Section 302: Barge and Transit Vessel Operations;

(D) Section 402: Sound Signature Tests;

(E) Section 501: General provisions for Avoiding Interference with Bowhead Whales or Subsistence Whale Hunting Activities;

(F) Section 502(b): Limitations on Geophysical Activity in the Chukchi Sea;

(G) Section 505: Termination of Operations and Transit Through the Bering Strait; and

(H) Title VI, Sections 601 and 602: Late Season Seismic Operations.

7. Monitoring:

(a) Vessel-based Visual Monitoring:

(i) Vessel-based visual monitoring for marine mammals shall be conducted by NMFS-approved protected species observers (PSOs) throughout the period of survey activities, and extends to 30 minutes after the survey is completed.

(ii) PSOs shall be stationed aboard the marine survey vessel and the vessel used to facilitate equipment recovery and maintenance work at the Burger A exploratory well site through the duration of the projects.

(iii) A sufficient number of PSOs shall be onboard the survey vessel to meet the following criteria:

(A) 100% monitoring coverage during all periods of survey operations in daylight;

(B) maximum of 4 consecutive hours on watch per PSO; and

(C) maximum of 12 hours of watch time per day per PSO.

(iv) The vessel-based marine mammal monitoring shall provide the basis for real-time mitigation measures as described in (6)(c) above.

(v) Results of the vessel-based marine mammal monitoring shall be used to calculate the estimation of the number of "takes" from the marine surveys and equipment recovery and maintenance program.

(b) Protected Species Observers and Training:

(i) PSO teams shall consist of Inupiat observers and NMFS-approved field biologists.

(ii) Experienced field crew leaders shall supervise the PSO teams in the field. New PSOs shall be paired with experienced observers to avoid situations where lack of experience impairs the quality of observations.

(iii) Crew leaders and most other biologists serving as observers in 2013 shall be individuals with experience as observers during recent seismic or shallow hazards monitoring projects in Alaska, the Canadian Beaufort, or other offshore areas in recent years.

(iv) Resumes for PSO candidates shall be provided to NMFS for review and acceptance of their qualifications. Inupiat observers shall be experienced in the region and familiar with the marine mammals of the area.

(v) All observers shall complete a NMFS-approved observer training course designed to familiarize individuals with monitoring and data collection procedures. The training course shall be completed before the anticipated start of the 2013 open-water season. The training session(s) shall be conducted by qualified marine mammalogists with extensive crew-leader experience during previous vessel-based monitoring programs. A marine mammal observers'

handbook, adapted for the specifics of the planned survey program will be reviewed as part of the training.

(vi) Training for both Alaska native PSOs and biologist PSOs shall be conducted at the same time in the same room. There shall not be separate training courses for the different PSOs.

(vii) Crew members should not be used as primary PSOs because they have other duties and generally do not have the same level of expertise, experience, or training as PSOs, but they could be stationed on the fantail of the vessel to observe the near field, especially the area around the airgun array and implement a rampdown or shutdown if a marine mammal enters the exclusion zone.

(viii) If crew members are to be used as PSOs, they shall go through some basic training consistent with the functions they will be asked to perform. The best approach would be for crew members and PSOs to go through the same training together.

(ix) PSOs shall be trained using visual aids (e.g., videos, photos), to help them identify the species that they are likely to encounter in the conditions under which the animals will likely be seen.

(x) Shell shall train its PSOs to follow a scanning schedule that consistently distributes scanning effort according to the purpose and need for observations. All PSOs should follow the same schedule to ensure consistency in their scanning efforts.

(xi) PSOs shall be trained in documenting the behaviors of marine mammals. PSOs should simply record the primary behavioral state (i.e., traveling, socializing, feeding, resting, approaching or moving away from vessels) and relative location of the observed marine mammals.

(c) PSO Handbook: A PSO's Handbook shall be prepared for Shell's 2013 vessel-based monitoring program. Handbooks contain maps, illustrations, and photographs, as well as text, and are intended to provide guidance and reference information to trained individuals who will participate as PSOs. The following topics shall be covered in the PSO Handbook for the Shell project:

(i) summary overview descriptions of the project, marine mammals and underwater noise, the marine mammal monitoring program (vessel roles, responsibilities), and the Marine Mammal Protection Act;

(ii) monitoring and mitigation objectives and procedures, including radii for exclusion zones and zones of influence (ZOIs);

(iii) responsibilities of staff and crew regarding the marine mammal monitoring plan;

(iv) instructions for ship crew regarding the marine mammal monitoring plan;

(v) data recording procedures: codes and coding instructions, PSO coding mistakes, electronic database; navigational, marine physical, field data sheet;

(vi) list of species that might be encountered: identification, natural history;

(vii) use of specialized field equipment (reticle binoculars, nigh vision devices, etc.);

(viii) table of wind speed, Beaufort wind force, and sea state codes; and

(ix) data quality-assurance/quality-control, delivery, storage, and backup procedures.

(d) Marine Mammal Observation Protocol:

(i) PSOs shall watch for marine mammals from the best available vantage point on the survey vessels, typically the bridge.

(ii) Observations by the PSOs on marine mammal presence and activity shall begin a minimum of 30 minutes prior to the estimated time that the seismic source is to be turned on and/or ramped-up.

(iii) PSOs shall scan systematically with the unaided eye and 7 x 50 reticle binoculars, supplemented with 20 x 60 image-stabilized Zeiss Binoculars or Fujinon 25 x 150 "Big-eye" binoculars, and night-vision equipment when needed.

(iv) Personnel on the bridge shall assist the marine mammal observer(s) in watching for marine mammals.

(v) PSOs aboard the marine survey vessel shall give particular attention to the areas within the marine mammal exclusion zones around the source vessel, as noted in (6)(a)(i) and (ii). They shall avoid the tendency to spend too much time evaluating animal behavior or entering data on forms, both of which detract from their primary purpose of monitoring the exclusion zone.

(vi) Monitoring shall consist of recording of the following information:

(A) the species, group size, age/size/sex categories (if determinable), the general behavioral activity, heading (if consistent), bearing and distance from seismic vessel, sighting cue, behavioral pace, and apparent reaction

of all marine mammals seen near the seismic vessel and/or its airgun array (e.g., none, avoidance, approach, paralleling, etc);

(B) the time, location, heading, speed, and activity of the vessel (shooting or not), along with sea state, visibility, cloud cover and sun glare at (I) any time a marine mammal is sighted (including pinnipeds hauled out on barrier islands), (II) at the start and end of each watch, and (III) during a watch (whenever there is a change in one or more variable);

(C) the identification of all vessels that are visible within 5 km of the seismic vessel whenever a marine mammal is sighted and the time observed;

(D) any identifiable marine mammal behavioral response (sighting data should be collected in a manner that will not detract from the PSO's ability to detect marine mammals);

(E) any adjustments made to operating procedures; and

(F) visibility during observation periods so that total estimates of take can be corrected accordingly.

(vii) Distances to nearby marine mammals will be estimated with binoculars (Fujinon 7 x 50 binoculars) containing a reticle to measure the vertical angle of the line of sight to the animal relative to the horizon. Observers may use a laser rangefinder to test and improve their abilities for visually estimating distances to objects in the water.

(viii) PSOs shall understand the importance of classifying marine mammals as "unknown" or "unidentified" if they cannot identify the animals to species with confidence. In those cases, they shall note any information that might aid in the identification of the marine mammal sighted. For example, for an unidentified mysticete whale, the observers should record whether the animal had a dorsal fin.

(ix) Additional details about unidentified marine mammal sightings, such as "blow only", mysticete with (or without) a dorsal fin, "seal splash", etc., shall be recorded.

(x) When a marine mammal is seen approaching or within the exclusion zone applicable to that species, the marine survey crew shall be notified immediately so that mitigation measures described in (6) can be promptly implemented.

(xi) Shell shall use of the best available technology to improve detection capability during periods of fog and other types of inclement weather. Such technology might include night-vision goggles or binoculars as well as other instruments that incorporate infrared technology.

(e) Field Data-Recording, Verification, Handling, and Security:

(i) PSOs shall record their observations directly into computers running a custom designed software package. Paper datasheets shall be available as backup if necessary.

(ii) The accuracy of the data entry shall be verified in the field by computerized validity checks as the data are entered, and by subsequent manual checking of the database printouts.

(iii) Quality control of the data shall be facilitated by

(A) the start-of-season training session,

(B) subsequent supervision by the onboard field crew leader, and

(C) ongoing data checks during the field season.

(iv) Data will be sent off of the ship to Anchorage each day and backed up regularly onto CDs and/or USB disks, and stored at separate locations on the vessel. Data shall be secured further by having data sheets and backup data CDs carried back to the Anchorage office during crew rotations.

(f) Passive Acoustic Monitoring:

(i) Sound Source Measurements: Using a hydrophone system, the holder of this Authorization is required to conduct sound source verification tests for seismic airgun array(s) and other marine survey equipment that are involved in the open-water marine surveys.

(A) Sound source verification shall consist of distances where broadside and endfire directions at which broadband received levels reach 190, 180, 170, 160, and 120 dB re 1 μPa (rms) for the airgun array(s). The configurations of airgun arrays shall include at least the full array and the operation of a single source that will be used during power downs.

(B) The test results shall be reported to NMFS within 5 days of completing the test.

(ii) Long-term Acoustic Monitoring

(A) Shell will use an acoustic net array to (I) collect information on the occurrence and distribution of marine mammals (including beluga whale, bowhead whale, walrus and other species) that may be available to subsistence hunters near villages located on the Chukchi Sea coast and to

document their relative abundance, habitat use, and migratory patterns; and (II) measure the ambient soundscape throughout the eastern Chukchi Sea and to record received levels of sounds from industry and other activities further offshore in the Chukchi Sea.

8. Data Analysis and Presentation in Reports:

(a) Estimation of potential takes or exposures shall be improved for times with low visibility (such as during fog or darkness) through interpolation or possibly using a probability approach. Those data could be used to interpolate possible takes during periods of restricted visibility.

(b) To better assess impacts to marine mammals, data analysis shall be separated into periods when a seismic airgun array (or a single mitigation airgun) is operating and when it is not. Final and report to NMFS should summarize and plot:

(i) Data for periods when a seismic array is active and when it is not; and

(ii) The respective predicted received sound conditions over fairly large areas (tens of km) around operations.

(c) To help evaluate the effectiveness of PSOs and more effectively estimate take, if appropriate data are available, Shell shall perform analysis of sightability curves (detection functions) for distance-based analyses.

(d) To better understand the potential effects of oil and gas activities on marine mammals and to facilitate integration among companies and other researchers, the following data should be obtained and provided electronically in the 90-day report:

(i) the location and time of each vessel-based sighting or acoustic detection;

(ii) position of the sighting or acoustic detection relative to ongoing operations (i.e., distance from sightings to seismic operation, DP operation, etc.), if known;

(iii) the nature of activities at the time (e.g., seismic on/off);

(iv) any identifiable marine mammal behavioral response (sighting data should be collected in a manner that will not detract from the PSO's ability to detect marine mammals); and

(v) adjustments made to operating procedures.

(e) Shell shall provide useful summaries and interpretations of results of the various elements of the monitoring results, which shall include a clear timeline and spatial (map) representation/summary of operations and important observations. Any and all mitigation measures (e.g., vessel course deviations for animal avoidance, operational shut

down) should be summarized. Additionally, an assessment of the efficacy of monitoring methods should be provided.

(f) Shell shall provide data from net arrays supported in part, or in whole, by Shell and will participate in the integration of acoustic arrays to assess the sound field of the lease areas in the Chukchi and Beaufort seas for the purposes of assessing patterns of marine mammal distribution and behavior and for assessing the impacts of multiple activities/factors.

9. Reporting:

(a) Sound Source Verification Report: A report on the preliminary results of the sound source verification measurements, including the measured 190, 180, 160, and 120 dB (rms) radii of the airgun sources and other acoustic survey equipment, shall be submitted within 14 days after collection of those measurements at the start of the field season. This report will specify the distances of the exclusion zones that were adopted for the survey.

(b) Shell shall produce a weekly GIS application that would be available on the web for regulators to view for every observation and mitigation measure implemented.

(c) Seismic Vessel Monitoring Program: A draft report will be submitted to the Director, Office of Protected Resources, NMFS, within 90 days after the end of Shell's 2013 open-water marine surveys in the Chukchi Seas. The report will describe in detail:

(i) summaries of monitoring effort (e.g., total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals);

(ii) analyses of the effects of various factors influencing detectability of marine mammals (e.g., sea state, number of observers, and fog/glare);

(iii) species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover;

(iv) to better assess impacts to marine mammals, data analysis should be separated into periods when an airgun array (or a single airgun) is operating and when it is not. Final and comprehensive reports to NMFS should summarize and plot:

(A) Data for periods when a seismic array is active and when it is not; and

(B) The respective predicted received sound conditions over fairly large areas (tens of km) around operations.

(v) sighting rates of marine mammals during periods with and without airgun activities (and other variables that could affect detectability), such as:

(A) initial sighting distances versus airgun activity state;

(B) closest point of approach versus airgun activity state;

(C) observed behaviors and types of movements versus airgun activity state;

(D) numbers of sightings/individuals seen versus airgun activity state;

(E) distribution around the survey vessel versus airgun activity state; and

(F) estimates of take by harassment.

(vi) reported results from all hypothesis tests should include estimates of the associated statistical power when practicable.

(vii) estimate and report uncertainty in all take estimates. Uncertainty could be expressed by the presentation of confidence limits, a minimum-maximum, posterior probability distribution, etc.; the exact approach would be selected based on the sampling method and data available.

(viii) The report should clearly compare authorized takes to the level of actual estimated takes.

(d) The draft report will be subject to review and comment by NMFS. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS. The draft report will be considered the final report for this activity under this Authorization if NMFS has not provided comments and recommendations within 90 days of receipt of the draft report.

10. (a) In the unanticipated event that survey operations clearly cause the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury or mortality (e.g., ship-strike, gear interaction, and/or entanglement), Shell shall immediately cease survey operations and immediately report the incident to the Supervisor of Incidental Take Program, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and Shane.Guan@noaa.gov and the Alaska Regional Stranding Coordinators (Aleria.Jensen@noaa.gov and Barbara.Mahoney@noaa.gov). The report must include the following information:

(i) time, date, and location (latitude/longitude) of the incident;

(ii) the name and type of vessel involved;

(iii) the vessel's speed during and leading up to the incident;

(iv) description of the incident;

(v) status of all sound source use in the 24 hours preceding the incident;

(vi) water depth;

(vii) environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);

(viii) description of marine mammal observations in the 24 hours preceding the incident;

(ix) species identification or description of the animal(s) involved;

(x) the fate of the animal(s); and

(xi) photographs or video footage of the animal (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with Shell to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Shell may not resume their activities until notified by NMFS via letter, email, or telephone.

(b) In the event that Shell discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), Shell will immediately report the incident to the Supervisor of the Incidental Take Program, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Jolie.Harrison@noaa.gov and Shane.Guan@noaa.gov and the NMFS Alaska Stranding Hotline (1-877-925-7773) and/or by email to the Alaska Regional Stranding Coordinators (Aleria.Jensen@noaa.gov and Barabara.Mahoney@noaa.gov). The report must include the same information identified in Condition 10(a) above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with Shell to determine whether modifications in the activities are appropriate.

(c). In the event that Shell discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in Condition 3 of this Authorization (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Shell shall report the incident to the Supervisor of the Incidental Take Program, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Jolie.Harrison@noaa.gov and Shane.Guan@noaa.gov and the NMFS Alaska Stranding

Hotline (1-877-925-7773) and/or by email to the Alaska Regional Stranding Coordinators (Aleria.Jensen@noaa.gov and Barbara.Mahoney@noaa.gov), within 24 hours of the discovery. Shell shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Shell can continue its operations under such a case.

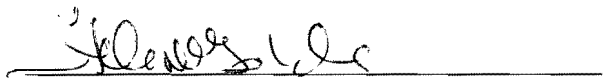
11. Activities related to the monitoring described in this Authorization do not require a separate scientific research permit issued under section 104 of the Marine Mammal Protection Act.

12. The Plan of Cooperation outlining the steps that will be taken to cooperate and communicate with the native communities to ensure the availability of marine mammals for subsistence uses, must be implemented.

13. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein or if the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals, or if there is an unmitigable adverse impact on the availability of such species or stocks for subsistence uses.

14. A copy of this Authorization and the Incidental Take Statement must be in the possession of each seismic vessel operator taking marine mammals under the authority of this Incidental Harassment Authorization.

15. Shell is required to comply with the Terms and Conditions of the Incidental Take Statement corresponding to NMFS' Biological Opinion.



JUL 15 2013

Donna S. Wieting, Director
Office of Protected Resources
National Marine Fisheries Service

Date

Table 1. Species/stocks and numbers of marine mammals allowed to be taken incidental to under this IHA.

Species / Stocks	Take Allowed
Bowhead whale / Bering-Chukchi-Beaufort Sea	209
Gray whale / Eastern North Pacific	270
Fin whale / Northeast Pacific	10
Humpback whale / Western North Pacific	10
Minke whale / Alaska	10
Beluga whale / Eastern Chukchi Sea	53
Narwhal	4
Killer whale / Aleutian Island and Bering Sea	10
Harbor porpoise / Bering Sea	35
Ringed seal / Alaska	5,096
Bearded seal / Alaska	178
Spotted seal / Alaska	102
Ribbon seal / Alaska	12

APPENDIX B: U.S. FISH AND WILDLIFE SERVICE LOA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. Tudor Road
Anchorage, Alaska 99503-6199

IN REPLY REFER TO:

AFES/MMM

JUN 28 2013

Ms. Susan Childs
Shell Exploration and Production Company
3601 C Street, Suite 1314
Anchorage, Alaska 99503

Dear Ms. Childs:

We have received your request dated April 8, 2013, for Letters of Authorizations (LOAs) for the incidental and intentional take of polar bears and Pacific walruses during activities associated with the Shell Exploration and Production (Shell) 2013 Chukchi Sea Open Water Marine Survey Program.

We have determined that the proposed activities will not need an authorization for intentional take of polar bears and Pacific walruses; therefore, no Intentional Take LOA will be issued to Shell for this project. Enclosed is LOA 13-CS-02 granting Shell authority to take small numbers of polar bears and Pacific walruses incidental to the activities identified in your request.

Shell plans to conduct geophysical surveys designed to gather additional data relative to site clearance, shallow hazards and ice gouge in select areas of the Chukchi Sea as described in your request. Shell further plans to conduct equipment recovery and maintenance activity at the Burger A drill site. A detailed description of the proposed activities is found in Shell's *Polar Bear, Pacific Walrus, and Grizzly Bear Avoidance and Human Encounter/Interaction Plan, Chukchi Sea, Alaska (May 2011)*, including *Addendum 2013-02, Proposed Open Marine Survey Program Activities, Chukchi Sea (April 2013)*, as well as Shell's *Marine Mammal Monitoring and Mitigation Plan for Open Water Marine Surveys and Equipment Recovery and Maintenance, Alaskan Chukchi Sea, 2013 (April 2013)*. All provisions contained within these plans are incorporated by reference into this LOA. This authorization is issued in accordance with the Incidental Take Regulations published in the *Federal Register* (78 FR 35364), dated June 12, 2013.

Shell must also provide monitoring data of polar bears and Pacific walruses throughout the project and a complete report of all observations at the conclusion of the project in accordance with 50 CFR §18.118. This final report must be provided to the U.S. Fish and Wildlife Service (Service), Marine Mammals Management Office (MMM) within 90 days after completion of the project.

If questions or concerns arise during the project period, Service biologists are available for consultation at the phone numbers listed below and noted in your Interaction Plan. If any changes develop in your project, such as activities or location, the MMM must be notified prior to the planned operation. This will allow us to evaluate the activity and, if appropriate, amend the LOA.

The Service has completed intra-Service consultation and conference under the Endangered Species Act of 1973, as amended (ESA), on the issuance of these LOAs and has determined that issuance is not likely to jeopardize the continuing existence of polar bears and Pacific walruses. Therefore, no additional authorization under the ESA is required.

If you have any further questions, please contact Mr. Craig Perham or Mr. Christopher Putnam of our Marine Mammals Management Office, at (907) 786-3810 or (907) 786-3844, respectively.

Sincerely,

Acting Chief, Marine Mammals Management

Enclosure

cc: Mr. Richard Shideler, Alaska Department of Fish and Game (email)
U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Field Office
U.S. Fish and Wildlife Service, Office of Law Enforcement
North Slope Borough, Department of Law

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. Tudor Road
Anchorage, Alaska 99503-6199

IN REPLY REFER TO:

AFES/MMM

U.S. Fish and Wildlife

LETTER OF AUTHORIZATION
(13-CS-02)

ISSUED: June 30, 2013
EXPIRES: October 31, 2013

Shell Exploration and Production (Shell) is hereby authorized to take small numbers of polar bears and Pacific walruses incidental to activities occurring during the 2013 Chukchi Sea Open Water Marine Survey Program. Shell plans to conduct geophysical surveys designed to gather additional data relative to site clearance, shallow hazards and ice gouge in select areas of the Chukchi Sea as described in your request. Shell further plans to conduct equipment recovery and maintenance activity at the Burger A drill site. A detailed description of the proposed activities is found in Shell's *Polar Bear, Pacific Walrus, and Grizzly Bear Avoidance and Human Encounter/Interaction Plan, Chukchi Sea, Alaska (May 2011)*, including *Addendum 2013-02, Proposed Open Marine Survey Program Activities, Chukchi Sea (April 2013)*, as well as Shell's *Marine Mammal Monitoring and Mitigation Plan for Open Water Marine Surveys and Equipment Recovery and Maintenance, Alaskan Chukchi Sea, 2013* (April 2013).

This Letter of Authorization (LOA) and the required conditions below include contractors of Shell performing Shell-approved work under the scope of operations to be conducted. The LOA is subject to the following conditions:

1. Intentional take is prohibited under this LOA.

2. Shell Operations Managers, or designates, must be fully aware, understand, and capable of implementing the conditions of this authorization.

3. The species authorized for takings, by Level B Harassment only, are: Pacific walrus (*Odobenus rosmarus divergens*), and polar bear (*Ursus maritimus*). The taking of any walrus or polar bear in a manner prohibited under this authorization must be reported within 24 hours of the taking to the U.S. Fish and Wildlife Service (Service), Marine Mammals Management Office (MMM), Incidental Take Coordinator in Anchorage, Alaska at (907) 786-3800, or their designee.

4. This authorization is valid only for those activities identified in the request for a Letter of Authorization dated April 8, 2013, and described in the *Addendum 2013-02, Proposed Open Marine Survey Program Activities, Chukchi Sea (April 2013).*

5. The *Polar Bear, Pacific Walrus, and Grizzly Bear Avoidance and Human Encounter/Interaction Plan Exploration Drilling Program Chukchi Sea, Alaska (May 2011),* including *Addendum 2013-02, Proposed Open Marine Survey Program Activities, Chukchi Sea (April 2013)*, as well as Shell's *Marine Mammal Monitoring and Mitigation Plan for Open Water Marine Surveys and Equipment Recovery and Maintenance, Alaskan Chukchi Sea, 2013* (April 2013), are approved. All provisions contained within these plans are incorporated by reference into this LOA. All provisions must be complied with unless specifically noted otherwise in this LOA. A copy of these plans must be available on site for all personnel. A copy of this LOA and these plans must be in the possession of the operators of all vessels and aircraft engaged in any activity operating under the authority of this LOA.

6. The holder of this LOA is required to cooperate with the Service and any other Federal, State or local agency monitoring the impacts of the activity on Pacific walruses and polar bears.

7. At the discretion of the Service, MMM, the operator will allow the Service, MMM to place an observer on site (vessels and aircraft) to monitor the impacts of the activity on Pacific walruses and polar bears.

8. If any changes develop in your project during the 2013 Chukchi Sea Open Water Marine Survey Program, such as activities or location, Shell must notify the Service, MMM prior to the planned operation.

9. Shell may not transit through or conduct operations in the Hanna Shoal Walrus Use Area (HSWUA) between July 1 and September 30[1].

10. Shell must comply with mitigation, monitoring and reporting requirements in accordance with 50 CFR §18.118. Mitigation, monitoring and reporting requirements include, but may not be limited to:

    A. Mitigation Requirements.

        i. At all times, vessels must maintain the maximum distance possible from concentrations of walruses or polar bears. Under no circumstances, other than an emergency, should any vessel approach within an 805-meter (m) (0.5-mile [mi]) radius of walruses or polar bears observed on ice. Under no circumstances, other than an emergency, should any vessel approach within 1,610 m (1 mi) of groups of walruses observed on land or within an 805-m (0.5-mi) radius of polar bears observed on land.

[1] The HSWUA is described in 78 FR 35364 (June 12, 2013) and based on, Jay, C.V., A.S. Fischbach, and A.A. Kochnev. 2012. Walrus areas of use in the Chukchi Sea during sparse sea ice cover. Marine Ecology Progress Series Vol. 468: 1–13, 2012) (GIS files available at, https://www.erma.unh.edu/arctic/erma.htm).

ii. Vessel operators must take every precaution to avoid harassment of concentrations of feeding walruses when a vessel is operating near these animals. Vessels should reduce speed and maintain a minimum 805-m (0.5-mi) operational exclusion zone around groups of 12 or more walruses encountered in the water. Vessels may not be operated in such a way as to separate members of a group of walruses from other members of the group. When weather conditions require, such as when visibility drops, vessels should adjust speed accordingly to avoid the likelihood of injury to walruses.

iii. Operators of support aircraft should, at all times, conduct their activities at the maximum distance possible from concentrations of walruses or polar bears.

iv. Under no circumstances, other than an emergency, should fixed wing aircraft operate at an altitude lower than 457 m (1,500 feet [ft]) within 805 m (0.5 mi) of walrus groups observed on ice, or within 1,610 m (1 mi) of walrus groups observed on land. Under no circumstances, other than an emergency, should rotary winged aircraft (helicopters) operate at an altitude lower than 914 m (3,000 ft) within 1,610 m (1 mi) of walrus groups observed on land. Under no circumstances, other than an emergency, should aircraft operate at an altitude lower than 457 m (1,500 ft) within 805 m (0.5 mi) of polar bears observed on ice or land. Helicopters may not hover or circle above such areas or within 805 m (0.5 mi) of such areas. When weather conditions do not allow a 457-m (1,500-ft) flying altitude, such as during severe storms or when cloud cover is low, aircraft may be operated below the required altitudes stipulated above. However, when aircraft are operated at altitudes below 457 m (1,500 ft) because of weather conditions, the operator must avoid areas of known walrus and polar bear concentrations and should take precautions to avoid flying directly over or within 805 m (0.5 mi) of these areas.

v. All vessels must avoid areas of active or anticipated subsistence hunting for walrus or polar bear as determined through community consultations. Plan all aircraft routes to minimize any potential conflict with active or anticipated walrus or polar bear hunting activity as determined through community consultations.

B. Additional mitigation measures for offshore seismic surveys. Any offshore exploration activity expected to include the production of pulsed underwater sounds with sound source levels greater or equal to (≥) 60 dB re 1 μPa will be required to establish and monitor acoustic exclusion and disturbance zones and implement adaptive mitigation measures as follows:

i. Monitor zones. Establish and monitor with trained marine mammal observers an acoustically verified exclusion zone for walruses surrounding seismic airgun arrays where the received level will be ≥ 180 dB re 1 μPa; an acoustically verified exclusion zone for polar bear surrounding seismic airgun arrays where the received level will be ≥ 190 dB re 1 μPa; and an acoustically verified walrus disturbance zone ahead of and perpendicular to the seismic vessel track where the received level will be ≥ 160 dB re 1 μPa.

ii. Ramp-up procedures. For all seismic surveys, including airgun testing, use the following ramp-up procedures to allow marine mammals to depart the exclusion zone before seismic surveying begins:

   a. Visually monitor the exclusion zone and adjacent waters for the absence of polar bears and walruses for at least 30 minutes before initiating ramp-up procedures. If no polar bears or walruses are detected, you may initiate ramp-up procedures. Do not initiate ramp-up procedures at night or when you cannot visually monitor the exclusion zone for marine mammals;
   b. Initiate ramp-up procedures by firing a single airgun. The preferred airgun to begin with should be the smallest airgun, in terms of energy output (dB) and volume (in^3);
   c. Continue ramp-up by gradually activating additional airguns over a period of at least 20 minutes, but no longer than 40 minutes, until the desired operating level of the airgun array is obtained.

iii. Power down/Shutdown. Immediately power down or shutdown the seismic airgun array and/or other acoustic sources whenever any walruses are sighted approaching close to or within the area delineated by the 180 dB re 1 μPa walrus exclusion zone, or polar bears are sighted approaching close to or within the area delineated by the 190 dB re 1 μPa polar bear exclusion zone. If the power down operation cannot reduce the received sound pressure level to 180 dB re 1 μPa (walrus) or 190 dB re 1 μPa (polar bear), the operator must immediately shutdown the seismic airgun array and/or other acoustic sources.

iv. Emergency shutdown. If observations are made or credible reports are received that one or more walruses and/or polar bears are within the area of the seismic survey and are in an injured or mortal state, or are indicating acute distress due to seismic noise, the seismic airgun array will be immediately shutdown and the Service contacted. The airgun array will not be restarted until review and approval has been given by the Service. The ramp-up procedures must be followed when restarting.

v. Adaptive response for walrus aggregations. Whenever an aggregation of 12 or more walruses are detected within an acoustically verified 160 dB re 1 μPa disturbance zone ahead of or perpendicular to the seismic vessel track, the holder of this LOA must:

   a. Immediately power down or shutdown the seismic airgun array and/or other acoustic sources to ensure sound pressure levels at the shortest distance to the aggregation do not exceed 160–dB re 1 μPa;
   b. Not proceed with powering up the seismic airgun array until it can be established that there are no walrus aggregations within the 160 dB zone based upon ship course, direction, and distance from last sighting. If shutdown was required, the ramp-up procedures must be followed when restarting.

C. Monitoring Requirements. Depending on the siting, timing, and nature of Industry activities, holders of Letters of Authorization will be required to:

i. Maintain trained, Service-approved, on-site observers to carry out monitoring programs for polar bears and walruses necessary for initiating adaptive mitigation responses.

ii. Marine Mammal Observers (MMOs) will be required on board all operational and support vessels to alert crew of the presence of walruses and polar bears and initiate adaptive mitigation responses, and to carry out specified monitoring activities identified in the marine mammal monitoring and mitigation necessary to evaluate the impact of authorized activities on walruses, polar bears, and the subsistence use of these subsistence resources. The MMOs must have completed a marine mammal observer training course approved by the Service.

D. Reporting requirements.

i. In-season monitoring reports.

a. Activity progress reports. Operators must keep the Service informed on the progress of authorized activities by:

- Notifying the Service at least 48 hours prior to the onset of activities;
- Providing weekly progress reports of authorized activities noting any significant changes in operating state and or location;
- Notifying the Service within 48 hours of ending activity.

ii. Walrus observation reports. The operator must report, on a weekly basis, all observations of walruses during any Industry operation. Information within the observation report will include, but is not limited to:

a. Date, time, and location of each walrus sighting;
b. Number, sex, and age of walruses (if determinable);
c. Observer name, company name, vessel name or aircraft number, LOA number, and contact information;
d. Weather, visibility, and ice conditions at the time of observation;
e. Estimated distance from the animal or group when initially sighted, at closest approach, and end of the encounter;
f. Industry activity at time of sighting and throughout the encounter. If a seismic survey, record the estimated radius of the zone of ensonification;
g. Behavior of animals at initial sighting, any change in behavior during the observation period, and distance from the observers associated with those behavioral changes;
h. Detailed description of the encounter;
i. Duration of the encounter;

j. Duration of any behavioral response (e.g., time and distance of a flight response)
k. Actions taken.

iii. Polar bear observation reports. The operator must report, within 24 hours, all observations of polar bears during any Industry operation. Information within the observation report will include, but is not limited to:

a. Date, time, and location of observation;
b. Number, sex, and age of bears (if determinable);
c. Observer name, company name, vessel name, LOA number, and contact information;
d. Weather, visibility, and ice conditions at the time of observation;
e. Estimated closest point of approach for bears from personnel and/or vessel/facilities;
f. Industry activity at time of sighting, and possible attractants present;
g. Behavior of animals at initial sighting and after contact;
h. Description of the encounter;
i. Duration of the encounter;
j. Actions taken.

iv. Notification of incident report. Reports should include all information specified under the species observation report, as well as a full written description of the encounter and actions taken by the operator. The operator must report to the Service within 24 hours:

a. Any incidental lethal take or injury of a polar bear or walrus;
b. Observations of walruses or polar bears within prescribed mitigation monitoring zones.

vi. After-action monitoring reports. The results of monitoring efforts identified in the marine mammal monitoring and mitigation plan must be submitted to the Service for review within 90 days of completing the year's activities. Results must include, but are not limited to, the following information:

a. A summary of monitoring effort including: Total hours, total distances, and distribution through study period of each vessel and aircraft;
b. Analysis of factors affecting the visibility and detectability of walruses and polar bears by specified monitoring;
c. Analysis of the distribution, abundance, and behavior of walrus and polar bear sightings in relation to date, location, ice conditions, and operational state;
d. Estimates of take based on the number of animals encountered/kilometer of vessel and aircraft operations by behavioral response (no response, moved away, dove, etc.), and animals encountered per day by behavioral response for stationary drilling operations;
e. Raw data in electronic format (i.e., Excel spreadsheet) as specified by the Service in consultation with Industry representatives

E. A report on the Plan of Cooperation, including the notification of the affected communities, measures taken to ensure that exploratory activities did not interfere with subsistence activities, and follow-up notification after the season, shall be submitted to the Service no later than 90 days after the end of 2013 Chukchi Sea Open Water Marine Survey Program. A copy of the report shall be sent to affected local subsistence communities, the Alaska Nanuuq Commission, the Eskimo Walrus Commission and the North Slope Borough Wildlife Department as well as to the Service.

Activities related to the monitoring described in this authorization do not require a separate scientific research permit issued under Section 104 of the Marine Mammal Protection Act.

This Letter of Authorization is valid for the period indicated above, unless extended or terminated in writing by the U.S. Fish and Wildlife Service.

Acting Chief, Marine Mammals Management

JUN 28 2013
Date

APPENDIX C: CONFLICT AVOIDANCE AGREEMENT

2013 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT

BETWEEN

BP EXPLORATION (ALASKA), INC.
ENI US OPERATING COMPANY, INC.
EXXON MOBIL CORPORATION
GX TECHNOLOGY CORP.
PIONEER NATURAL RESOURCES ALASKA, INC.
SAExploration
SHELL OFFSHORE, INC
TGS

AND

THE ALASKA ESKIMO WHALING COMMISSION
THE BARROW WHALING CAPTAINS' ASSOCIATION
THE GAMBELL WHALING CAPTAINS' ASSOCIATION
THE KAKTOVIK WHALING CAPTAINS' ASSOCIATION
THE KIVALINA WHALING CAPTAINS' ASSOCIATION
THE LITTLE DIOMEDE WHALING CAPTAINS' ASSOCIATION
THE NUIQSUT WHALING CAPTAINS' ASSOCIATION
THE PT. HOPE WHALING CAPTAINS' ASSOCIATION
THE PT. LAY WHALING CAPTAINS' ASSOCIATION
THE SAVOONGA WHALING CAPTAINS' ASSOCIATION
THE WAINWRIGHT WHALING CAPTAINS' ASSOCIATION
THE WALES WHALING CAPTAINS' ASSOCIATION

TABLE OF CONTENTS

TITLE I – GENERAL PROVISIONS

SECTION 101. APPLICATION.

Title I applies to all Participants, except as provided in Title VI.

Title II applies to all Participants, except as provided in Titles III or VI.

Title III applies to those Participants who operate barge or transit vessels in the Beaufort Sea or Chukchi Sea.

Titles IV and V apply only to those Participants who engage in oil and gas operations, except as provided in Title VI.

Title VI applies to those Participants who engage exclusively in geophysical activities that are conducted at least 5 miles or more from the Alaska coast in the Beaufort Sea or Chukchi Sea and begin on or after October 1, 2013.

Provisions that apply to a specific activity or are designated as specific to either the Beaufort Sea or Chukchi Sea apply only to Participants that engage in that activity or operate in that area, and provisions applicable to activities a Participant does not engage in or areas in which a Participant does not operate do not apply to that Participant.

SECTION 102. PURPOSE.

The purpose of this Agreement is to provide:

(1) Equipment and procedures for communications between Subsistence Participants and Industry Participants;

(2) Avoidance guidelines and other mitigation measures to be followed by the Industry Participants working in or transiting the vicinity of active subsistence hunters, in areas where subsistence hunters anticipate hunting, or in areas that are in sufficient proximity to areas expected to be used for subsistence hunting that the planned activities could potentially adversely affect the subsistence bowhead whale hunt through effects on bowhead whales;

(3) Measures to be taken in the event of an emergency occurring during the term of this Agreement; and

(4) Dispute resolution procedures.

SECTION 103. DEFINITIONS.

(a) Defined Terms.

For the purposes of this Agreement:

(1) The term "Agreement" means this 2013 Open Water Season Programmatic Conflict Avoidance Agreement and any attachments to such agreement.

(2) The term "at-sea oil and gas operations" does not include gravel islands or fixed platform developments located near shore (for example Northstar or Oooguruk) or Near Shore Operations Support Vessels.

(3) The term "barge" means a non-powered vessel that is pushed or towed, and the accompanying pushing or towing vessel, which is used solely to transport materials through the Beaufort Sea or Chukchi Sea. Such term does not include any vessel used to provide supplies or support to at-sea oil and gas operations or Near Shore Operations Support Vessels.

(4) The term "Com-Center" means a communications systems coordination center established under Section 203.

(5) The term "geophysical activity" means any activity the purpose of which is to gather data for imaging the marine subsurface environment, including but not limited to use of air guns, sonar, and other geophysical equipment used for seismic exploration or shallow hazard identification. "Geophysical activity" does not include support vessels that are not actively employing geophysical equipment, or other supporting activities that do not generate sound waves for the purposes of imaging the subsurface marine environment.

(6) The term "geophysical equipment" means equipment, such as air gun arrays over 300 cubic inches or sparker arrays over 20,000 kJ, employed on a vessel or a towed array, that generates sound waves for the purpose of imaging the subsurface marine environment for exploration and development purposes. The term does not include vessel engines, generators, or sources such as fathometers, fish finders, side-scan sonar, or other sources intended for engineering and /or transportation purposes.

(7) The term "Industry Participants" means all parties to this Agreement who are not Subsistence Participants.

(8) The term "Marine Mammal Observer / Inupiat Communicator" or "MMO/IC" means an observer hired by an Industry Participant for the purpose of spotting and identifying marine mammals in the area of that Industry Participant's operations during the Open Water Season. The MMO/IC also serves as the on-board Inupiat communicator who can communicate directly with whaling crews.[1]

(9) The term "Near Shore Operations Support Vessels" means vessels (including aircraft) used to support related activities (such as supply, re-supply, crew movement, and facility maintenance) for near shore oil and gas operations by an Industry Participant.

(10) The terms "NSB" and "NSB DWM" mean the North Slope Borough and the North Slope Borough Department of Wildlife Management, respectively.

(11) The term "oil and gas operations" means all oil and gas exploration, development, or production activities (including, but not limited to, geophysical activity, exploratory drilling, development activities (such as dredging or construction), production drilling, or production, and related activities (such as supply, re-supply, crew movements, and facility maintenance) by or for any Industry Participant, including aircraft and vessels of whatever kind used in support of such activities, occurring in the Beaufort Sea or Chukchi Sea, whether occurring near shore or offshore, but does not include barge traffic, transit vessel traffic, cable laying vessel traffic, or research vessel traffic (i.e. traffic by a vessel which is only conducting research and is not conducting any geophysical activities) by or for any Participant.

(12) The term "Open Water Season" means the period of the year when ice conditions permit navigation or oil and gas operations to occur in the Beaufort Sea or Chukchi Sea, as appropriate.

[1] Following the 2013 CAA meeting, a request was put in to change the title of MMO/IC to "Protected Species Observer," to make the term consistent with the terminology used by the National Science Foundation. The AEWC will raise this suggestion during the 2014 CAA meeting.

(13) The term "Participants" means all parties identified in this Agreement by name and whose representative(s) has signed the Agreement, and all contractors of such parties. When used alone the term includes both Industry Participants and Subsistence Participants.

(14) The term "Primary Sound Source Vessel" means a vessel owned or operated by or for an Industry Participant that (A) employs air gun arrays greater than 300 cubic inches or sparkers greater that 20,000 kJ, for imaging the subsurface environment, (B) is used to monitor any safety zone around a vessel described in subsection (A), (C) is engaged in ice-breaking, or (D) is the lead vessel in a group of barge or transit vessels.

(15) The term "sonar" means equipment, employed as hull mounted or towed array, intended for the active location of surface or underwater vessels. The term does not include vessel engines, generators, or sources such as fathometers, fish finders, side-scan sonar, or other sources intended for engineering, cable laying or routing, and/or transportation purposes.

(16) The term "Subsistence Participants" means the Alaska Eskimo Whaling Commission (AEWC) and its members, including the whaling captains' associations identified on the cover of this Agreement, as well as any individual members of those associations.

(17) The term "transit vessel" means a powered vessel that is used solely to transport materials through the Beaufort Sea or Chukchi Sea. Such term does not include a vessel used to provide supplies or other support to at-sea oil and gas operations or Near Shore Operations Support Vessels.

(b) Geographically Limited Terms.

For the purposes of this Agreement:

(1) The term "Beaufort Sea" means all waters off the northern coast of Alaska from Point Barrow to the Canadian border.

(2) The term "Chukchi Sea" means all waters off the western and northern coasts of Alaska from Cape Prince of Wales to Point Barrow.

SECTION 104. TERM, SCOPE, AND LIMITATIONS.

(a) Term.

The term of this Agreement shall commence with the signing of this document by the Participants and shall terminate upon completion of the Nuiqsut, Kaktovik, Barrow, Wainwright, Pt Lay, and Pt. Hope Fall Bowhead Hunts or the Beaufort Sea Post Season Meeting required under Section 108(a) and Chukchi Sea Post-Season Meetings in Barrow, Wainwright, Pt. Lay, and Pt. Hope required under Section 108(b), whichever is later.

(b) Scope.

The Participants agree that, unless otherwise specified:

(1) The mitigation measures identified in this Agreement, which are intended to mitigate interference by oil and gas operations and barge and transit vessel traffic with the Alaskan Eskimo subsistence bowhead whale hunt, are designed to apply to all activities of each Participant during the 2013 Open Water Season, whether referenced specifically or by category, and to all vessels and locations covered by this Agreement, whether referenced specifically or by category.

(2) This Agreement is intended to apply to all oil and gas operations and barge and transit vessel traffic during the 2013 Open Water Season in the Beaufort Sea or Chukchi Sea.

(3) Vessels and locations covered by this Agreement include those identified in the Agreement, as well as any other vessels or locations that are employed by or for the Industry Participants in the Beaufort Sea or Chukchi Sea during the 2013 Open Water Season.

(c) Limitations of Obligations.

The following limitations apply to this Agreement.

(1) No cooperation among the Participants, other than that required by this Agreement, is intended or otherwise implied by their adherence to this Agreement. In no event shall the signatures of any representative of the Alaska Eskimo Whaling Commission (AEWC), or of the Barrow, Nuiqsut, Kaktovik, Wainwright, Pt. Hope, or Pt. Lay Whaling Captains' Associations, or of any other Whaling Captains' Association be taken as an endorsement of any Arctic operations or Beaufort Sea or Chukchi Sea OCS operations by any oil and/or gas operator or contractor.

(2) Adherence to the procedures and guidelines set forth in this Agreement does not in any way indicate that any Inupiat or Siberian Yupik whalers or the AEWC agree that industrial activities are not interfering with the bowhead whale migration or the bowhead whale subsistence hunt. Such adherence does not represent an admission on the part of the Industry Participants or their contractors that the activities covered by this Agreement will interfere with the bowhead whale migration or the bowhead whale subsistence hunt.

(3) No member of the oil and gas industry or any contractor has the authority to impose restrictions on the subsistence hunting of bowhead whales or associated activities of the AEWC, residents of the Villages of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Lay, or Pt. Hope, or residents of any other village represented by the AEWC.

(4) In the event additional parties engage in oil and gas operations in the Beaufort Sea or Chukchi Sea during the summer or fall of 2013 the Participants shall exercise their good-faith efforts to encourage those parties to enter into this Agreement. Should additional parties enter into this Agreement at a date subsequent to the date of the signing of this document and before the termination of the 2013 bowhead whale subsistence hunting season, the AEWC will provide to all Participants a supplement to this document with the added signatures.

(5) No Participant is responsible for enlisting additional parties to adhere to the terms and conditions of the Agreement. Similarly, **THE AEWC IS NOT RESPONSIBLE FOR, OR A PARTY TO, ANY AGREEMENT AMONG THE INDUSTRY PARTICIPANTS** concerning the apportionment of expenses necessary for the implementation of this Agreement.

(6) In adhering to this Agreement, none of the Participants waives any rights existing at law. All Participants agree that the provisions of this document do not establish any precedent as between them or with any regulatory or permitting authority.

(7) **PARTICIPANTS' OBLIGATIONS SHALL BE SEPARABLE**: All Participants to this Agreement understand that each Participant represents a separate entity. The failure of any Participant to adhere to this Agreement or to abide by the terms and conditions of this Agreement shall not affect the obligation of other Participants to adhere to this Agreement and to proceed accordingly with all activities covered by this Agreement. Nor shall any Participant's adherence to this Agreement affect that Participant's duties, liabilities, or other obligations with respect to any other Participant beyond those stated in this Agreement. If an Industry Participant does not receive permit approvals from regulatory agencies to conduct its proposed activities, then that company may withdraw from this Agreement.

SECTION 105. REGULATORY COMPLIANCE.

(a) United States Coast Guard Requirements.

The Participants shall comply with all applicable United States Coast Guard requirements for safety, navigation, and notice.

(b) Environmental Regulations and Statutes.

The Participants shall comply with all applicable environmental regulations and statutes.

(c) Other Regulatory Requirements.

The Participants shall comply with all applicable federal, state, and local government requirements.

SECTION 106. DISPUTE RESOLUTION.

Subject to the terms of Section 104(c)(7) of this Agreement, all disputes arising between any Industry Participants and any Subsistence Participants shall be addressed as follows:

(1) The dispute shall first be addressed between the affected Participant(s) in consultation with the affected village Whaling Captains' Association and the Industry Participant(s)' Local Representative.

(2) If the dispute cannot be resolved to the satisfaction of all affected Participants, then the dispute shall be addressed with the affected Participants in consultation with the AEWC.

(3) If the dispute cannot be satisfactorily resolved in accordance with paragraphs (1) and (2) above, then the dispute shall be addressed with the AEWC and the affected Participants in consultation with representatives of NOAA Fisheries.

(4) All Participants shall seek to resolve any disputes in a timely manner, and shall work to ensure that requests for information or decisions are responded to promptly.

SECTON 107. EMERGENCY AND OTHER NECESSARY ASSISTANCE.

(a) Emergency Communications.

ALL VESSELS SHOULD NOTIFY THE APPROPRIATE COM-CENTER IMMEDIATELY IN THE EVENT OF AN EMERGENCY. The appropriate Com-Center operator will notify the nearest vessels and appropriate search and rescue authorities of the problem and advise them regarding necessary assistance. (See attached listing of local search and rescue organizations in Attachment I.)

(b) Emergency Assistance for Subsistence Whale Hunters.

Section 403 of Public Law 107-372 (16 U.S.C. 916c note) provides that "Notwithstanding any provision of law, the use of a vessel to tow a whale, taken in a traditional subsistence whale hunt permitted by Federal law and conducted in waters off the coast of Alaska is authorized, if such towing is performed upon a request for emergency assistance made by a subsistence whale hunting organization formally recognized by an agency of the United States government, or made by a member of such an organization, to prevent the loss of a whale." Industry Participants will advise their vessel captains that, under the circumstances described above, assistance to tow a whale is permitted under law when requested by a Subsistence Participant. Under the circumstances described above, Industry Participants will provide such assistance upon a request for emergency assistance from a Subsistence Participant, if conditions permit the Industry Participant's vessel to safely do so.

SECTION 108. POST-SEASON REVIEW / PRESEASON INTRODUCTION.

(a) Beaufort Sea Post-Season Joint Meeting.

Following the end of the fall 2013 bowhead whale subsistence hunt and prior to the 2013 Pre-Season Introduction Meetings, the Industry Participant that establishes the Deadhorse and Kaktovik Com Centers will offer to the AEWC Chairman to host a joint meeting with all whaling captains of the Villages of Nuiqsut, Kaktovik and Barrow, the Marine Mammal Observer / Inupiat Communicators stationed on the Industry Participants' vessels in the Beaufort Sea, and with the Chairman and Executive Director of the AEWC, at a mutually agreed upon time and place on the North Slope of Alaska, to review the results of the 2013 Beaufort Sea Open Water Season, unless it is agreed by all designated individuals or their representatives that such a meeting is not necessary.

(b) Chukchi Sea Post-Season Village Meetings.

Following the completion of the 2013 Chukchi Sea Open Water Season and prior to the 2014 Pre-Season Introduction Meetings, the Industry Participants involved, if requested by the AEWC or the Whaling Captain's Association of each village, will host a meeting in each of the following villages: Wainwright, Pt. Lay, Pt. Hope, Kivalina, Little Diomede, Wales, Savoonga, and Barrow (or a joint meeting of the whaling captains from all of these villages if the whaling captains agree to a joint meeting) to review the results of the 2013 operations and to discuss any concerns residents of those villages might have regarding the operations. The meetings will include the Marine Mammal Observer / Inupiat Communicators stationed on the Industry Participants' vessels in the Chukchi Sea. The Chairman and Executive Director of the AEWC will be invited to attend the meeting(s).

(c) Pre-season Introduction Meetings.

(1) Immediately following each of the above meetings, and at the same location, the Industry Participants will provide a brief introduction to their planned operations for the 2014 Open Water Season. Each Industry Participant should provide hand-outs explaining their planned activities that the whaling captains can review.

(2) Subsistence Participants understand that any planned operations discussed at these Pre-Season Introduction Meetings, and the corresponding maps, will represent the Industry Participant's best estimate at that time of its planned operations for the coming year, but that these planned operations are preliminary, and are subject to change prior to the 2014 Open Water Season Meeting.

(d) Map of Planned Industry Participant Activities.

As practicable, Industry Participants shall jointly prepare and provide the AEWC with a large-scale map of the Beaufort and Chukchi Seas showing the locations and types of oil and gas and barge and transit activities planned by each Industry Participant. This map will be for use by the AEWC and Industry Participants during the 2014 CAA Meeting.

SECTON 109. INDIVIDUAL NOTIFICATION.

In the event that any Industry Participant does not become a signatory to this Agreement, the local Whaling Captains' Associations shall be notified by the AEWC, no later than March 31, 2013, so that the local Whaling Captains' Associations can prepare to talk with the non-signatories to avoid conflict during that association's fall subsistence bowhead whaling season.

TITLE II -- OPEN WATER SEASON COMMUNICATIONS

SECTION 201. MARINE MAMMAL OBSERVERS / INUPIAT COMMUNICATORS.

(a) Marine Mammal Observer / Inupiat Communicator Required.

(1) In General. Each Industry Participant agrees to employ a Marine Mammal Observer / Inupiat Communicator (MMO/IC) on board each Primary Sound Source Vessel owned or operated by such Industry Participant in the Beaufort Sea or Chukchi Sea. Native residents of the eleven villages represented by the Alaska Eskimo Whaling Commission shall be given preference in hiring for MMO/IC positions.

(2) Special Rule for Inside Beaufort Sea Barrier Islands. Industry Participants whose seismic acquisition operations are limited to an area exclusively within the barrier islands need employ an MMO/IC on one Primary Sound Source Vessel only.

(3) Near Shore Operations Support Vessels. Industry Participants are not required to employ an MMO/IC on Near Shore Operations Support Vessels.

(4) Sealift Operations. For Industry Participants conducting sealift operations in which two tugs towing barges are accompanied within ½ mile by a third light tug at all times, a MMO/IC is required to be employed on the light tug only.

(b) Duties of Marine Mammal Observer / Inupiat Communicator.

(1) Each MMO/IC is to be employed as an observer and Inupiat communicator for the duration of the 2013 Open Water Season on the vessel on which he or she is stationed.

(2) As a member of the crew, the MMO/IC will be subject to the regular code of employee conduct on board the vessel and will be subject to discipline, termination, suspension, layoff, or firing under the same conditions as other employees of the vessel operator or appropriate contractor.

(3) Once the source vessel on which the MMO/IC is employed is in the vicinity of a whaling area and the whalers have launched their boats, the MMO/IC's primary duty will be to carry out the communications responsibilities set out in this Title.

(4) At all other times, the MMO/IC will be responsible for keeping a lookout for bowhead whales and/or other marine mammals in the vicinity of the vessel to assist the vessel captain in avoiding harm to the whales and other marine mammals.

(5) It is the MMO/IC's responsibility to call the appropriate Com-Center as set out in Sections 202 and 203.

(6) The MMO/IC will be responsible for all radio contacts between vessels owned or operated by each of the Industry Participants and whaling boats covered under Section 207 of this Agreement and shall interpret communications as needed to allow the vessel operator to take such action as may be necessary pursuant to this Agreement.

(7) The MMO/IC shall contact directly subsistence whaling boats that may be in the vicinity to ensure that conflicts are avoided to the greatest possible extent.

(8) The MMO/IC will maintain a record of his or her communications with each Com-Center and the subsistence whaling boats, as well as any marine mammal sightings by the MMO/IC.

SECTION 202. COM-CENTER GENERAL COMMUNICATIONS SCHEME.

(a) Reporting Positions for Vessels Owned or Operated by the Industry Participants.

(1) All vessels (other than vessels covered under sections 302 and 602) shall report to the appropriate Com-Center at least once every six hours commencing with a call at approximately 06:00 hours. Each call shall report the following information:

(A) Vessel name, operator of vessel, charter or owner of vessel, and the project the vessel is working on.

(B) Vessel location, speed, and direction.

C) Plans for vessel movement between the time of the call and the time of the next call. The final call of the day shall include a statement of the vessel's general area of expected operations for the following day, if known at that time.

EXAMPLE: This is the Arctic Endeavor, operated by _____ for _____ at Chukchi Sea prospect. We are currently at ___'___ north ___'___ west, proceeding SE at ____ knots. We will proceed on this course for ___ hours and will report location and direction at that time.

(2) The appropriate Com-Center shall be notified if there is any significant change in plans, such as an unannounced start-up of operations or significant deviations from announced course, and such Com-Center shall notify all whalers of such changes. A call to the appropriate Com-Center shall be made regarding any unsafe or unanticipated ice conditions.

(3) In the event that the Industry Participant's operation includes seismic data acquisition, the operator reserves the right to restrict exact vessel location information and provide more general location information.

(b) Reporting Positions for Subsistence Whale Hunting Crews.

(1) All subsistence whaling captains shall report to the appropriate Com-Center at the time they launch their boats from shore and again when they return to shore.

(2) All subsistence whaling captains shall report to such Com-Center the initial GPS coordinates of their whaling camps.

(3) Additional communications shall be made on an as needed basis.

(4) Each call shall report the following information:

(A) The crew's location and general direction of travel.

EXAMPLE: This is _____. We are just starting out. We will be traveling north-east from _____ to scout for whales. I will call if our plans change.

(B) The presence of any vessels or aircraft owned or operated by any of the Industry Participants, or their contractors, that are not observing the specified guidelines set forth in Title V on Avoiding Conflicts.

(C) The final call of the day shall include a statement of the whaling captain's general area of expected operations for the following day, if known at the time.

(5) Any subsistence whale hunter preparing to tow a caught whale shall report to the appropriate Com-Center before starting to tow.

EXAMPLE: This is Archie Ahkiviana. I am ___'___ north, ___'___ west. I have a whale and am towing it into _____.

(6) Each time a subsistence whaling camp is moved, it shall be reported promptly to the appropriate Com-Center, including the new GPS coordinates.

(7) Subsistence whale hunters shall notify the appropriate Com-Center promptly if, due to weather or any other unforeseen event, whaling is not going to take place that day.

(8) Subsistence whaling captains shall contact the appropriate Com-Center promptly and report any unexpected movements of their vessel.

(c) Responsibilities of Participants.

(1) Monitoring VHF Channel 16.

All vessels covered by Sections 207, 301, and 401 of this Agreement shall monitor marine VHF Channel 16 at all times.

(2) Avoidance of Whale Hunting Crews and Areas

It is the responsibility of each vessel owned or operated by any of the Industry Participants and covered by Sections 301 or 401 of this Agreement to determine the positions of all of their vessels and to exercise due care in avoiding any areas where subsistence whale hunting is active.

(3) Vessel-to-Vessel Communication

After any vessel owned or operated by any of the Industry Participants and covered by Sections 301 or 401 of this Agreement has been informed of or has determined the location of subsistence whale hunting boats in its vicinity, the MMO/IC shall contact those boats in order to coordinate movement and take necessary avoidance precautions.

SECTION 203. THE COMMUNICATIONS SYSTEM COORDINATION CENTERS (COM-CENTERS).

(a) Chukchi Lead System Included in Com-Center Coverage.

In addition to the Beaufort Sea and Chukchi Sea, the communications scheme shall apply in the Chukchi Sea lead system, as identified and excluded from leasing in the current MMS Five-Year Leasing Program, 2007-2012.

(b) Set Up and Operation.

(1) Subject to the terms of Section 104(c) and Section 601 of this Agreement, the Industry Participants conducting operations during the Com-Center operational window specified in Section 203(c) in:

(A) the Beaufort Sea jointly will arrange for the funding of Com-Centers in Deadhorse and Kaktovik; and

(B) the Chukchi Sea jointly will arrange for the funding of Com-Centers in Barrow, Wainwright, Pt. Lay, Pt. Hope, Kivalina, Wales, and St. Lawrence Island.

(2) All nine Com-Centers will be staffed by Inupiat operators. **GROUND TRANSPORTATION MUST BE PROVIDED FOR COM-CENTER OPERATIONS IN KAKTOVIK FOR POLAR BEAR AND BROWN BEAR SAFETY**. The Com-Centers will be operated 24 hours per day during the 2013 subsistence bowhead whale hunt. One Industry Participant in the Beaufort Sea and one Industry Participant in the Chukchi Sea, or their respective contractor, will be designated as the operator of the Com-Centers for that Sea, in consultation with the AEWC.

(3) Each Industry Participant shall contribute to the funding of the Com-Centers covering the areas in which it conducts oil and gas operations. The level of funding for the Com-Centers provided by each of the Industry Participants is intended to be in proportion to the scale of their respective activities, and shall be mutually agreed by the Industry Participants.

(4) The procedures to be followed by the Com-Center operators are set forth in subsection (d) below.

(c) Staffing.

(1) Each Com-Center shall have an Inupiat operator ("Com-Center operator") on duty 24 hours per day from August 15, or one week before the start of the fall bowhead whale hunt in each respective village, until the end of the bowhead whale subsistence hunt in villages listed in subparagraphs (A) through (G) and until the completion of all Industry Participant vessel transits (other than a vessel covered under Title V) in villages listed in subparagraphs (G) through (I):

(A) Kaktovik for the Kaktovik Com-Center;

(B) Nuiqsut for the Deadhorse Com-Center;

(C) Barrow for the Barrow Com-Center;

(D) Wainwright for the Wainwright Com-Center.

(E) Pt. Lay for the Pt. Lay Com-Center, which will be located in the Pt. Lay Whaling Captains' Association building; and

(F) Pt. Hope for the Pt. Hope Com-Center, which will be located in the Pt. Hope Whaling Captains' Association building.

(G) Kivalina for the Kivalina Com-Center.

(H) Wales for the Wales Com-Center.

(I) Gambell or Savoonga for the St. Lawrence Island Com-Center.

(2) All Com-Center staff shall be local hire.

(d) Duties of the Com-Center Operators.

(1) The Com-Center operators shall be available to receive radio and telephone calls and to call vessels as described below. A record shall be made of all calls from every vessel covered by Sections 207, 301, and 401 of this Agreement. Information reported regarding whales struck, lost, landed, or the location of whales struck, lost, or landed, or the number of strikes remaining, shall be confidential and shall not be disclosed to anyone other than the AEWC or the local Whaling Captains' Association. The record of all reporting calls should contain the following information:

(A) Industry Participant Vessel:

(i) Name of caller and vessel.

(ii) Vessel location, speed, and direction.

(iii) Time of call.

(iv) Anticipated movements between this call and the next report.

(v) Reports of any industry or subsistence activities.

(B) Subsistence Whale Hunting Boat:

(i) Name of caller.

(ii) Location of boat or camp.

(iii) Time of call.

(iv) Plans for travel.

(v) Any special information such as caught whale, whale to be towed, or industry vessel conflicts with whale or whaler. Any report of the number of whales struck, lost, or landed, or of the number of strikes remaining, shall be kept confidential and shall not be disclosed by the Com-Center or any Com-Center operator to anyone other than the AEWC or the local Whaling Captains' Association. The location of whales struck, lost, or landed shall be kept confidential and shall not be disclosed except to the extent needed to avoid an Industry/Subsistence Whale Hunter conflict.

(2) Report of Industry/Subsistence Whale Hunter Conflict. In the event an industry/subsistence whale hunter conflict is reported, the appropriate Com-Center operator shall record:

(A) Name of industry vessel.

(B) Name of subsistence whaling captain.

(C) Location of vessels.

(D) Nature of conflict, data, and time.

(3) If all vessels and boats covered by Sections 207, 301, and 401 of this Agreement have not reported to the appropriate Com-Center within one hour of the recommended time, that Com-Center operator shall attempt to call all non-reporting vessels to determine the information set out above under the Duties of the Com-Center operator.

(4) As soon as location information is provided by a vessel covered by Sections 207, 301, or 401 of this Agreement, the appropriate Com-Center operator shall plot the location and area of probable operations on the large map provided at the Com-Center.

(5) If, in receiving information or plotting it, a Com-Center operator observes that operations by Industry Participants might conflict with subsistence whaling activities, such Com-Center operator shall contact the industry vessel involved and advise the Industry Participant's Local Representative(s) and the vessel operators of the potential conflict.

SECTION 204. STANDARDIZED LOG BOOKS.

The Industry Participants will provide the Com-Centers and Marine Mammal Observer / Inupiat Communicators with identical log books to assist in the standardization of record keeping associated with communications procedures required pursuant to this Agreement.

SECTION 205. COMMUNICATIONS EQUIPMENT.

(a) Communications Equipment to be Provided to Subsistence Whale Hunting Crews.

(1) In General. The Industry Participants will provide (or participate in the provision of) the communications equipment described in paragraphs (4) and (6) of this subsection and subsection (b) of this section.

(2) Beaufort Sea. The Industry Participants funding Com-Centers in Deadhorse and Kaktovik will fund the provision of communications equipment for the whaling captains of Kaktovik and Nuiqsut in the same proportion as they fund those Com-Centers.

(3) Chukchi Sea. The Industry participants conducting operations in the Chukchi Sea will coordinate with each other to participate in funding the provision of communications equipment for the whaling captains of Barrow, Wainwright, Pt. Hope, and Pt. Lay.

(4) All-Channel, Water-Resistant VHF Radios.

These VHF radios are specifically designed for marine use and allow monitoring of Channel 16 while using or listening to another channel.

(A) Kaktovik Subsistence Whaling Boats: 8

(B) Kaktovik Base and Search and Rescue: 2

(C) Nuiqsut Subsistence Whaling Boats: 12

(D) Nuiqsut Base and Search and Rescue: 3

(E) Barrow Base and Search and Rescue: 2

(F) Wainwright Base and Search and Rescue: 2

(G) Wainwright Subsistence Whaling Boats: 4

(H) Pt. Hope Base and Search and Rescue: 2

(I) Pt. Hope Subsistence Whaling Boats: 10

(J) Pt. Lay Base and Search and Rescue: 2

(K) Pt. Lay Subsistence Whaling Boats: 4

(5) Specific VHF Channels For Each Village.

The whaling boats from each of the villages have been assigned individual VHF channels for vessel-to-vessel and vessel-to-Com-Center communications as follows:

(A) Nuiqsut whaling crews will use Channel 68.

(B) Kaktovik whaling crews will use Channel 69.

(C) Barrow whaling crews will use Channel 72.

(D) Wainwright Whaling Crews will use Channel 12.

(E) Pt. Lay Whaling Crews will use Channel 72.

(F) Pt. Hope Whaling Crews will use Channel 68.

(6) Satellite Telephones.

The satellite telephones are to be used as backup for the VHF radios. The satellite telephones for use on subsistence whaling boats are for emergency use only and should be programmed for direct dial to the nearest Com-Center.

A. Kaktovik Base Phones: 2

B. Kaktovik Subsistence Whaling Boats: 8

C. Nuiqsut Base Phones: 2

D. Nuiqsut Subsistence Whaling Boats: 12

E. Barrow Subsistence Whaling Boats: 2

F. Wainwright Subsistence Whaling Boats: 4

G. Pt. Lay Subsistence Whaling Boats: 2

(7) Distribution and Return of Equipment.

The distribution of the VHF radios and satellite telephone equipment to whaling captains for use during the 2013 fall bowhead subsistence whale hunting season shall be completed no later than August 15, 2013. All such units and telephone equipment provided under this Agreement, whether in this section or otherwise, will be returned promptly by the Subsistence Participants to the Industry Participant or the person providing such units and equipment at the end of each Village's 2013 fall bowhead whale subsistence hunt.

(b) Communications Equipment on Vessels Owned or Operated by the Industry Participants and/or their Contractors.

The Marine Mammal Observer / Inupiat Communicators onboard source vessels owned or operated by the Industry Participants and/or their contractors will also be supplied with all-channel VHF radios. The MMO/ICs have been assigned Channel 7 for their exclusive use in communicating with the Com-Center. Such radios shall be returned upon the completion or termination of the MMO/IC's assignment.

(c) Radio Installation and User Training.

The Whaling Captains of Nuiqsut, Kaktovik, Wainwright, Pt. Lay, and Pt. Hope, with assistance from the Industry Participants, will be responsible for the installation of the VHF radio equipment. The Industry participants will provide (or participate in the provision of) on-site user training for the VHF and satellite telephone equipment on or before August 15, 2013, if requested and as scheduled by the Whaling Captains' Associations of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Lay, and Pt. Hope, and the Industry Participant operating the Beaufort Sea Com-Centers or Chukchi Sea Com-Centers, as appropriate.

SECTION 206. INDIVIDUALS TO CONTACT.

Listed below are the primary contact names and phone numbers for each of the Participants.

(1) BP Exploration (Alaska), Inc.'s (BP) Local Representative

LOWRY BROTT will be BP's local representative on the North Slope during the Term of this Agreement and will be stationed at Northstar Island and will be available by telephone at (907) 670-3520 and when Mr. Brott is not available, his alternate, Jeff Carter, will be stationed at Northstar Island and will be available by telephone at the above number.

(2) ENI's Local Representative

Robert Province: Robert.Province@enipetroleum.com 907-865-3350

(3) Exxon Mobil's Local Representative

Anthony Pennino: Anthony.pennino@exxonmobile.com (907) 334-2929

Brien Reep: Brien.e.reep@exxonmobil.com (907) 564-3617

(4) GX Technology's Local Representative

Ed Nelson (832) 344-6852

(5) Pioneer Natural Resources' (Pioneer) Local Representative

PAT FOLEY will be Pioneer's local representative during the Term of this Agreement and will be stationed in Anchorage and will be available by telephone at (907) 343-2110.

(6) Shell Offshore Inc.'s (Shell) Local Representatives

CRAIG BLANCHARD and HOWARD HILL will be Shell's local representatives on the North Slope during the Term of this Agreement and will be stationed at Barrow during Chukchi Sea operations and at Deadhorse during Beaufort Sea operations and will be available by telephone at (907) 770-3700.

(7) STATOIL's Local Representative

Ella Ede: eede@statoil.com (907) 444-3473

(8) SAExploration

TBD

(9) TGS

TBD

(10) The Village of Kaktovik

For purposes of this Agreement, the individuals to contact for the Village of Kaktovik will be: JOSEPH KALEAK at (907) 640-6213 or 640-6515, and CHARLIE M. BROWER at (907) 640-4163 (home), (907) 640-2092 (work), or (907) 640-0052 (cell).

(11) The Village of Nuiqsut

For purposes of this Agreement, the individuals to contact for the Village of Nuiqsut will be: ISAAC NUKAPIGAK at (907) 480-6220 (Work); (907) 480-2400 (Home).

(12) The Village of Barrow

For purposes of this Agreement, the individuals to contact for the Village of Barrow will be: HARRY BROWER, JR. at (907) 852-0350 (Work), and EUGENE BROWER at (907) 852-3601.

(13) The Village of Wainwright

For purposes of this Agreement, the individuals to contact for the Village of Wainwright will be: ROSSMAN PEETOOK at (907) 763-4774, and WALTER NAYAKIK at (907)763-2915 (Work).

(14) The Village of Pt. Hope

For purposes of this Agreement, the individuals to contact for the Village of Pt. Hope will be: CHESTER FRANKSON, SR. at (907) 368-2054 (Home).

(15) The Village of Pt. Lay

For purposes of this Agreement, the individuals to contact for the Village of Pt. Lay will be: JULIUS REXFORD (907) 833-4592 (Home), (907) 833-2214 (Work), (907) 833-2320 (Fax), THOMAS NUKAPIAK (907) 833-6467 (Home), (907) 833-3838.

(16) The Village of Kivilina

For the purposes of this Agreement, the individuals to contact for the Village of Kivilina will be: _____.

(17) The Village of Little Diomede

For the purposes of this Agreement, the individuals to contact for the Village of LIttle Diomede will be: _____.

(18) The Village of Wales

For the purposes of this Agreement, the individuals to contact for the Village of Wales will be: _____.

(19) The Village of Savoonga

For the purposes of this Agreement, the individuals to contact for the Village of Savoonga will be: George Noonwook at (907) 984-2461 and Isaac Kulowiyi at (907)984-6123.

(20) The Village of Gambell

For the purposes of this Agreement, the individuals to contact for the Village of Gambell will be: .Merlin Koonooka at (907) 985-5113 or (907) 434-1180 (cell), and Bruce Boolowon at (907) 985-5212.

(21) The AEWC

For purposes of this Agreement, the individuals to contact for the AEWC shall be: JOHNNY AIKEN at (907) 852-2392.

SECTION 207. SUBSISTENCE WHALE HUNTING BOATS.

The following is a list of the number of boats each of the Subsistence Participants plan to use:

(1) Boats Owned/Used by Whaling Captains of Nuiqsut (NWCA)

The subsistence whaling crews of the Village of Nuiqsut plan to use (16) twelve boats for subsistence whale hunting during the late summer and fall of 2013.

(2) Boats Owned/Used by Whaling Captains of Kaktovik (KWCA)

The subsistence whaling crews of the Village of Kaktovik plan to use (6) eight boats for subsistence whale hunting during the late summer and fall of 2013.

(3) Boats Owned/Used by Whaling Captains of Barrow (BWCA)

The subsistence whaling crews of the Village of Barrow plan to use (34) forty boats for subsistence whale hunting during the late summer and fall of 2013.

(4) Boats Owned/Used by Whaling Captains of Wainwright (WWCA)

The subsistence whaling crews of the Village of Wainwright plan to use (4) four boats for subsistence whale hunting during the fall of 2013.

(5) Boats Owned/Used by Whaling Captains of Pt. Hope (Pt. HWCA)

The subsistence whaling crews of the Village of Pt. Hope plan to use (14) ten boats for subsistence whale hunting during the late fall of 2013.

(6) Boats Owned/Used by Whaling Captains of Pt. Lay (Pt. LWCA)

The subsistence whaling crews of the Village of Pt. Lay plan to use (4) four boats for subsistence whale hunting during the fall of 2013.

If any additional boats are put in use by subsistence whaling crews, the Industry Participants will be notified promptly through the Com-Center.

TITLE III – BARGE AND TRANSIT VESSEL OPERATIONS

SECTION 301. IN GENERAL.

A Participant may employ barges or transit vessels to transport materials through the Beaufort Sea or Chukchi Sea during the term of this Agreement. Any Industry Participant who employs a barge or transit vessel to transport materials through the Beaufort Sea or Chukchi Sea during the term of this Agreement shall require the barge or transit vessel operator to comply with Sections 201, 205(b) and 302 of this Agreement while providing services to that Industry Participant.

SECTION 302. BARGE AND TRANSIT VESSEL OPERATIONS.

(a) Reporting Positions for Barge or Transit Vessels Owned or Operated by industry Participants.

(1) All barge, transit, or cable laying vessels shall report to the appropriate Com-Center at least once every six hours commencing with a call at approximately 06:00 hours. Each call shall report the following information:

(A) Barge, transit, or cable laying vessel name, operator of vessel, charterer or owner of vessel, and the project or entity the vessel is transporting materials for.

(B) Barge, transit, or cable laying vessel location, speed, and direction.

(C) Plans for barge, transit, or cable laying vessel movement between the time of the call and the time of the next call. The final call of the day shall include a statement of the barge or transit vessel's general area of expected operations for the following day, if known at that time.

EXAMPLE: This is the Arctic Endeavor, operated by _____ for _____ in the Chukchi Sea. We are currently at ___'___ north ___'___ west, proceeding SE at ____ knots. We will proceed on this course for ___ hours and will report location and direction at that time.

(2) The appropriate Com-Center also shall be notified if there is any significant change in plans, such as an unannounced start-up of operations or significant deviations from announced course, and such Com-Center shall notify all whalers of such changes. A call to the appropriate Com-Center shall be made regarding any unsafe or unanticipated ice conditions.

(b) Operator Duties.

All barge or transit vessel operators are responsible for the following requirements.

(1) Monitoring VHF Channel 16. All barge and transit vessel operators shall monitor marine VHF Channel 16 at all times.

(2) Avoidance of Whale Hunting Crews and Areas. It is the responsibility of each Industry Participant and barge or transit vessel operator to determine the positions of their barge or transit vessels and to exercise due care in avoiding any areas where subsistence whale hunting is active.

(3) Vessel-to-Vessel Communication. After any barge or transit vessel owned or operated by any Industry Participant has been informed of or has determined the location of subsistence whale hunting boats in its vicinity, the Marine Mammal Observer / Inupiat Communicator shall contact those boats in order to coordinate movement and take necessary avoidance precautions.

(c) Routing Barge and Transit Vessels.

(1) All barge or transit vessel routes shall be planned so as to minimize any potential conflict with bowhead whales or subsistence whaling activities. All barges and transit vessels shall avoid areas of active or anticipated whaling activity, as reported pursuant to Section 202.

(2) Beaufort Sea. Vessels transiting east of Bullen Point to the Canadian border should remain at least five (5) miles offshore during transit along the coast, provided ice and sea conditions allow.

(3) Chukchi Sea. Vessels should remain as far offshore as weather and ice conditions allow, and at all times at least five (5) miles offshore during transit.

(4) Safe Harbor / Loitering. Notwithstanding paragraphs 2 and 3, from August 31 to October 31 vessels in the Chukchi Sea or Beaufort Sea shall remain at least 20 miles offshore of the coast of Alaska from Icy Cape in the Chukchi Sea to Pitt Point on the east side of Smith Bay in the Beaufort Sea whether in transit or engaging in activities in support of oil and gas operations, unless ice conditions or an emergency that threatens the safety of the vessel or crew prevents compliance with this requirement. This paragraph shall not apply to vessels actively engaged in transit to or from a coastal community to conduct crew changes or logistical support operations.

(d) Vessel Speeds.

Barge and transit vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowhead whales or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.

(e) Vessels Operating in Proximity of Bowhead Whales.

If any barge or transit vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:

(1) reducing vessel speed to less than 5 knots within 900 feet of the whale(s);

(2) steering around the whale(s) if possible;

(3) operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;

(4) operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and

(5) checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

(f) Marine Mammal Sighting Data.

Industry Participants whose operations are limited exclusively to barge or vessel traffic will submit to the AEWC and NSB DWM all marine mammal sighting data.

TITLE IV – VESSELS, TESTING, AND MONITORING

SECTION 401. INDUSTRY PARTICIPANT VESSELS AND EQUIPMENT.

(a) List of Vessels and Equipment Required.

Each Industry Participant engaged in oil and gas operations shall provide a list identifying all vessels or other equipment (including but not limited to boats, barges, aircraft, or similar craft) that are owned and/or operated by, or that are under contract to the Industry Participants, for use in the Beaufort Sea or Chukchi Sea for oil and gas operations or for implementation of such Industry Participant's monitoring plan. Vessels and equipment used for oil and gas operations shall be listed in Attachment II, and vessels and equipment used for monitoring plans shall be listed in Attachment III.

(b) Only Listed Vessels and Equipment (or Like Vessels and Like Equipment) May Be Used.

(1) **NONE OF THE INDUSTRY PARTICIPANTS INTENDS TO OPERATE ANY VESSEL OR EQUIPMENT (EXCEPT FOR LIKE VESSELS OR LIKE EQUIPMENT) NOT IDENTIFIED IN THE LISTS REQUIRED UNDER SUBSECTION (a) DURING THE TERM OF THIS AGREEMENT.**

(2) Notwithstanding paragraph 1, if any Industry Participant decides to use different vessels or equipment or additional vessels or equipment, such vessels and equipment shall be used only for purposes identified in Attachments II or III; and the AEWC and the whaling captains of Nuiqsut, Kaktovik, Barrow, Wainwright, Pt. Hope, and Pt. Lay shall be notified promptly through the appropriate Com-Center, as identified in Section 203 of this Agreement, and in writing, of their identity and their intended use, including location of use.

SECTION 402. SOUND SIGNATURE TESTS.

(a) Sound Source Verification Testing.

(1) Geophysical Equipment. For purposes of obtaining a sound signature for Industry Participants' geophysical equipment, the Industry Participants shall have initiated a test of all geophysical equipment within 72 hours of initiating or having initiated operations in the Beaufort Sea or Chukchi Sea. Such tests shall be conducted as set forth in section 402(b).

(2) Vessels. For vessels engaged in geophysical activity, Industry Participants will conduct a sound source verification test for all geophysical equipment used for geophysical activity. Each Industry Participant shall establish a sound source verification range or Industry Participants may participate jointly in establishing a range for the Chukchi Sea and Beaufort Sea, or both. A separate range shall be used for the Chukchi Sea and Beaufort Sea, and vessels shall use the appropriate range for each sea in which they operate. For testing each vessel shall proceed through the range and record information on the date, time, vessel speed, vessel route, vessel load, weather conditions, and equipment operating on the vessel (all noise generating equipment on the vessel, other than geophysical equipment subject to separate testing under paragraph (1), shall be in operation while the vessel is proceeding through the range). The range should be established near a location where details on wind speed and direction are regularly monitored and archived.

(b) Mutual Agreement on Site for Testing; Advance Notice Required.

(1) In General. Each geophysical equipment sound signature test shall be conducted at a site mutually agreed upon by the Industry Participant conducting such test and the AEWC. Each Industry Participant conducting such sound signature test(s) will make a good faith effort to provide three (3) weeks advance notice to the AEWC and the NSB DWM of its intent to perform each test.

(2) Beaufort Sea Testing. For geophysical equipment sound signature tests conducted in the Beaufort Sea, the Industry Participant conducting such tests shall provide transportation for an appropriate number of representatives from: the AEWC, the whaling captains of the Villages of Barrow, Nuiqsut, and Kaktovik, and the NSB DWM to observe the sound signature tests.

(3) Chukchi Sea Testing. For geophysical equipment sound signature tests conducted on vessels to be used in the Chukchi Sea, the Industry Participant(s) conducting such tests shall provide transportation for an appropriate number of representatives from: the AEWC, the whaling captains of the Villages of Barrow, Wainwright, Pt. Lay, and Pt. Hope, and the NSB DWM to observe the sound signature tests.

(c) Sound Signature Data to be Made Available.

(1) Within fourteen (14) days of completing the sound signature field tests for geophysical equipment and within thirty (30) days of the end of the operating season for sound source verification ranges, each Industry Participant and/or its contractor conducting such test(s) will make preliminary and final quality controlled results of the sound signature test(s) available upon request to the AEWC and the NSB DWM. The Industry Participant and/or its contractor will also provide the AEWC and the NSB DWM the preliminary analysis of that data, as well as any other applicable sound signature data that is available and that the AEWC, the NSB DWM, and the Industry Participant agree is relevant to understanding the potential noise impacts of the proposed operations to migrating bowhead whales or other affected marine mammals.

(2) Once completed the final data analysis will be provided to the AEWC and the NSB DWM upon request. The final data report for the sound source verification testing shall be provided to the NSB DWM and the AEWC no later than December 31, 2013.

(3) Any Industry Participant who prepares a model of the sound signature of its vessels and operations, whether before or after the sound signature test, will provide copies of those models and any related analysis to the AEWC and the NSB DWM upon request.

SECTION 403. MONITORING PLANS.

(a) Monitoring Plan Required.

(1) Each Industry Participant agrees to prepare and implement a monitoring plan to collect data designed to determine the potential effects of its oil and gas operations on fall migrating bowhead whales.

(2) The monitoring plans shall be designed in cooperation with the AEWC, the NSB DWM, and NOAA Fisheries, together with the Bureau of Ocean Energy Management (BOEM) when operating in Federal waters. If additional outside review is requested by any of the above entities, the Industry Participant will evaluate the request on a case by case basis.

(b) Beaufort Sea Monitoring Plans.

In the Beaufort Sea, the monitoring plans should focus on the identity, timing, location, and numbers of marine mammals and their behavioral responses to the noise source. The monitoring plans will place emphasis on understanding potential impacts from industrial sounds on bowhead whales.

(c) Chukchi Sea Monitoring Plans.

In the Chukchi Sea, the monitoring plans should focus on the identity, timing, location, and numbers of marine mammals and their behavioral responses to the noise source. The monitoring plans will place emphasis on understanding potential impacts from industrial sounds on bowhead whales.

(d) Use of Prior Information and Peer Reviewed Data.

(1) Prior impact study results shall be incorporated into the monitoring plans prepared by each Industry Participant as applicable.

(2) Each monitoring plan for oil and gas operations shall be subject to peer review by stakeholders on a peer review panel identified by NOAA Fisheries at the 2013 Open Water Season Peer Review Meeting, convened by NOAA Fisheries. Draft plans will be submitted to the NSB DWM and AEWC no later than two weeks prior to the 2013 Open Water Peer Review Meeting.

(e) Raw Data, Communication, and Summary Required.

(1) Each Industry Participant conducting site-specific monitoring will:

(A) after quality control reviews are completed, make electronic data, available to the NSB DWM at the end of the season.

(B) permit and encourage open communications among their contractors and the AEWC and NSB DWM.

(2) Each Industry Participant will submit a summary of monitoring plan results and progress to the AEWC and NSB DWM every two weeks during the operating season.

SECTION 404. CUMULATIVE NOISE IMPACTS STUDY.

Each Industry Participant further agrees to provide its monitoring plan and sound signature data, for use in a cumulative effects analysis of the multiple sound sources and their possible relationship to any observed changes in marine mammal behavior, to be undertaken pursuant to a Cumulative Noise Impacts Study.

The study design for the Cumulative Impacts Study shall be developed through a Cumulative Impacts Workshop to be organized by the North Slope Borough in the winter of 2013/2014. The results of this workshop will be presented at the 2014 Open Water Meeting.

TITLE V – AVOIDING CONFLICTS DURING THE OPEN WATER SEASON

Industry Participants are reminded that Sections 101(a)(5)(A) and (D) of the Marine Mammal Protection Act provide, among other things, that the Secretary can authorize the incidental taking of small numbers of marine mammals of a species or population stock if the Secretary finds, among other things, that the total of such takings during the authorized period **will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses.**

The following Operating Guidelines apply in the Beaufort Sea and Chukchi Sea, except as otherwise specified and in all cases with due regard to environmental conditions and operational safety. These Operating Guidelines are in addition to any permit restrictions or stipulations imposed by the applicable governmental agencies.

SECTION 501. GENERAL PROVISIONS FOR AVOIDING INTERFERENCE WITH BOWHEAD WHALES OR SUBSISTENCE WHALE HUNTING ACTIVITIES.

(a) Routing Vessels and Aircraft.

(1) All vessel and aircraft routes shall be planned so as to minimize any potential conflict with bowhead whales or bowhead subsistence whaling activities. All vessels shall avoid areas of active or anticipated whaling activity (as reported pursuant to Section 202).

(2) Beaufort Sea. Vessels transiting east of Bullen Point to the Canadian border should remain at least five (5) miles offshore during transit along the coast, provided ice and sea conditions allow.

(3) Chukchi Sea. Vessels should remain as far offshore as weather and ice conditions allow, and at least five (5) miles offshore during transit.

(4) Safe Harbor / Loitering. Notwithstanding paragraphs 2 and 3, from August 31 to October 31 vessels in the Chukchi Sea or Beaufort Sea shall remain at least 20 miles offshore of the coast of Alaska from Icy Cape in the Chukchi Sea to Pitt Point on the east side of Smith Bay in the Beaufort Sea whether in transit or engaging in activities in support of oil and gas operations unless ice conditions or an emergency that threatens the safety of the vessel or crew prevents compliance with this requirement. This paragraph shall not apply to vessels actively engaged in transit to or from a coastal community to conduct crew changes or logistical support operations.

(b) Aircraft Altitude Floor and Flight Path.

(1) AIRCRAFT SHALL NOT OPERATE BELOW 1500 FEET unless the aircraft is engaged in marine mammal monitoring, approaching, landing or taking off, or unless engaged in providing assistance to a whaler or in poor weather (low ceilings) or any other emergency situations. Aircraft engaged in marine mammal monitoring shall not operate below 1500 feet in areas of active whaling; such areas to be identified through communications with the Com-Centers.

(2) Except for airplanes engaged in marine mammal monitoring, aircraft shall use a flight path that keeps the aircraft at least five (5) miles inland until the aircraft is directly south of its offshore destination, then at that point it shall fly directly north to its destination.

(c) Vessel Speeds.

Vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowhead whales or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.

(d) Vessels Operating in Proximity of Bowhead Whales.

If any vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:

(1) reducing vessel speed to less than 5 knots within 900 feet of the whale(s);

(2) steering around the whale(s) if possible;

(3) operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;

(4) operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and

(5) checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

SECTION 502. GEOPHYSICAL ACTIVITY LIMITATIONS.

The following operating limitations are to be observed and the operations are to be accompanied by a monitoring plan as set forth in Section 403 and Attachment III of this Agreement. The Industry Participants conducting geophysical activity agree to coordinate the timing and location of such activity so as to reduce, by the greatest extent reasonably possible, the level of noise energy entering the water from such activity at any given time and at any given location.

(a) Limitations on Geophysical Activity in the Beaufort Sea.

All geophysical activity in the Beaufort Sea shall be conducted in accordance with the terms set forth below.

(1) Kaktovik: No geophysical activity from the Canadian Border to the Canning River (146 deg. 4 min. W) from 25 August to close of the fall bowhead whale hunt in Kaktovik and Nuiqsut.[2] From August 10 to August 25, Industry Participants will communicate and collaborate with AEWC on any planned vessel movement in and around Kaktovik and Cross Island to avoid impacts to whale hunt.

(2) Nuiqsut:

A. Pt. Storkerson(~148 deg. 42 min. W) to Thetis Island (~150 deg. 10.2 min. W).

(i) *Inside the Barrier Islands*: No geophysical activity prior to July 25. Geophysical activity is allowed from July 25 until completion of operations[3]

(ii). *Outside the Barrier Islands:* No geophysical activity from August 25 to close of fall bowhead whale hunting in Nuiqsut. Geophysical activity is allowed at all other times.

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[2] The bowhead whale subsistence hunt will be considered closed for a particular village when the village Whaling Captains' Association declares the hunt ended or the village quota has been exhausted (as announced by the village Whaling Captains' Association or the AEWC), whichever occurs earlier.

[3] Geophysical activity allowed in this area after August 25 shall include a source array of no more than 12 air guns, a source layout no greater than 8 m x 6 m, and a single source volume no greater than 880 in^3.

b. Canning River (~146 deg. 4 min. W) to Pt. Storkerson (~148 deg. 42 min. W): No geophysical activity from August 25 to the close of bowhead whale subsistence hunting in Nuiqsut.

(3) Barrow: No geophysical activity from Pitt Point on the east side of Smith Bay (~152 deg. 15 min. W) to a location about half way between Barrow and Peard Bay (~157 deg. 20 min. W) from September 15 to the close of the fall bowhead whale hunt in Barrow.

(b) Limitations on Geophysical Activity in the Chukchi Sea.

All geophysical activity in the Chukchi Sea shall be conducted in accordance with the terms set forth below.

(1) Beginning September 15, and ending with the close of the fall bowhead whale hunt,[4] if Wainwright, Pt. Lay, or Pt. Hope intend to whale in the Chukchi Sea, no more than two geophysical activities employing geophysical equipment will occur at any one time in the Chukchi Sea. During the fall bowhead whale hunt, geophysical equipment will not be used by Participants within 30 miles of any point along the Chukchi Sea coastline. Industry Participants will contact the Whaling Captains' Associations of each of those villages to determine if a village is prepared to whale and will notify the AEWC of any response.

(2) Safe harbor will be at sites selected by the Industry Participants and the AEWC. Safe harbor sites will be agreed upon no later than the beginning of operations and shall be listed in Attachment IV. However, a vessel captain will seek safety for his assets (vessel and personnel) as is his duty under the Law of the Sea.

(3) Any vessel operating within 60 miles of the Chukchi Sea coast will follow the communications procedures set forth in Title II of this Agreement. All vessels will adhere to the conflict avoidance measures set forth in Section 501 of this Agreement.

(4) If a dispute should arise, the resolution process set forth in Section 106 of this Agreement shall apply.

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[4] The bowhead whale subsistence hunt will be considered closed when village Whaling Captains' Associations of Wainwright, Pt. Lay, and Pt. Hope have each declared that (A) they do not intend to hunt, (B) their village hunt has ended, or (C) the village quota has been exhausted (as announced by the village Whaling Captains' Association or the AEWC), whichever occurs earlier.

(5) Barrow: No geophysical activity from Pitt Point on the east side of Smith Bay (~152 deg. 15 min. W) to a location about half way between Barrow and Peard Bay (~157 deg. 20 min. W) from September 15 to the close of the fall bowhead whale hunt in Barrow.

(6) Notwithstanding any other provision of this Agreement, any Industry Participant who engages exclusively in geophysical activities that are conducted at least 45 miles or more from the Alaska coast in the Chukchi Sea shall only be responsible for complying with Title I (excluding Sections 104(c)(4) and 108(a) and (b)) and Sections 201, 205(b), 206, 501, and this subsection 502(b) of this Agreement. For the avoidance of doubt, an Industry Participant described in this subsection 502(b) shall be subject to the requirements of Section 203 only to the extent of one Com-Center at the closest community to the seismic acquisition area.

SECTION 503. DRILLING AND PRODUCTION.

(a) Camden Bay.

For exploratory drilling and production between 144 deg. W and the Canning River (~146 deg. 4 min. W), zero discharge of:

(1) drilling fluids;

(2) cuttings after 20" casing;

(3) treated sanitary and gray water; and

(4) ballast and bilge water.

(b) Drilling Operations in the Beaufort Sea East of Cross Island.

No drilling equipment or related vessels used for at-sea oil and gas operations shall be onsite at any offshore drilling location east of Cross Island from 25 August until the close of the bowhead whale hunt in Nuiqsut and Kaktovik. However, such equipment may remain within the Beaufort Sea in the vicinity of 71 degrees 25 minutes N and 146 degrees 4 minutes W., or at the edge of the Arctic ice pack, whichever is closer to shore.

(c) Drilling Operations in the Beaufort Sea West of Cross Island.

In 2013, no drilling equipment or related vessels used for at-sea oil and gas operations shall be moved onsite at any location outside the barrier islands west of Cross Island until the close of the bowhead whale hunt in Barrow.

(d) Oil Spill Mitigation Agreement.

Industry Participants engaged in drilling operations agree to enter into a binding oil spill mitigation agreement with the Alaska Eskimo Whaling Commission, the North Slope Borough, and the Inupiat Community of the Arctic Slope to provide for hunter transport to alternate hunting locations in the event of an oil spill. The agreement shall be attached as Attachment V.

SECTION 504. SHORE-BASED SERVICE AND SUPPLY AREAS.

Shore-based service and supply areas used by Industry Participants shall be located and operated so as to ensure compliance with the terms of this Agreement.

SECTION 505. TERMINATION OF OPERATIONS AND TRANSIT THROUGH THE BERING STRAIT.

Except as provided in Title VI, all Industry Participant vessels shall complete operations in time to allow such vessels to complete transit through the Bering Strait to a point south of 59 degrees North latitude no later than November 15, 2013. Any Industry Participant vessel that encounters weather or ice that will prevent compliance with the date in the preceding sentence shall coordinate its transit through the Bering Strait to a point south of 59 degrees North latitude with the appropriate Com-Centers listed in Section 203. All Industry Participant vessels shall, weather and ice permitting, transit east of St. Lawrence Island and no closer than 10 miles from the shore of St. Lawrence Island.

TITLE VI – LATE SEASON SEISMIC OPERATIONS

SECTION 601. IN GENERAL.

Notwithstanding any other provision of this Agreement, any Industry Participant who engages exclusively in geophysical activities that are conducted at least 5 miles or more from the Alaska coast in the Beaufort Sea or Chukchi Sea and begin on or after October 1, 2013 shall only be responsible to comply with Title I (excluding Sections 104(c)(4) and 108(a) and (b)) and Sections 201, 205(b), 206, 502(a), and 602 of this Agreement. For the avoidance of doubt, an Industry Participant described in this Section 601 shall not be subject to the requirements of Section 203 including but not limited to funding of Com-Centers, providing certain equipment, training and providing representatives as designated operators of Com-Centers.

SECTION 602. VESSEL OPERATIONS.

(a) Reporting Positions When Vessels Come Within 40 Miles of the Coast.

(1) A vessel subject to this section operating within 40 miles of the Alaska coast shall report to the appropriate Com-Center, if open, at least once every six hours commencing with a call at approximately 06:00 hours. Each call shall report the following information:

(A) Vessel name, operator of vessel, charter or owner of vessel, and the project or entity the vessel is conducting operations for.

(B) Vessel location, speed, and direction.

(C) Plans for vessel movement between the time of the call and the time of the next call. The final call of the day shall include a statement of the vessel's general area of expected operations for the following day, if known at that time.

EXAMPLE: This is the Arctic Endeavor, operated by _____ for _____ in the Chukchi Sea. We are currently at ___'___ north ___'___ west, proceeding SE at _____ knots. We will proceed on this course for ___ hours and will report location and direction at that time.

(2) The appropriate Com-Center, if open, also shall be notified if there is any significant change in plans, such as an unannounced start-up of operations or significant deviations from announced course, and such Com-Center shall notify all whalers of such changes. A call to the appropriate Com-Center shall be made regarding any unsafe or unanticipated ice conditions.

(b) Operator Duties.

All vessel operators subject to this title are responsible for the following requirements.

(1) Monitoring VHF Channel 16. All vessel operators shall monitor marine VHF Channel 16 at all times.

(2) Avoidance of Whale Hunting Crews and Areas. It is the responsibility of each Industry Participant and vessel operator to determine the positions of their vessels and to exercise due care in avoiding any areas where subsistence whale hunting is active.

(3) Vessel-to-Vessel Communication. After any vessel owned or operated by any Industry Participant has been informed of or has determined the location of subsistence whale hunting boats in its vicinity, the Marine Mammal Observer / Inupiat Communicator shall contact those boats in order to coordinate movement and take necessary avoidance precautions.

(c) Routing Vessels.

(1) All vessel routes within 40 miles of the Alaska coast shall be planned so as to minimize any potential conflict with bowhead whales or subsistence whaling activities. All vessels shall avoid areas of active or anticipated whaling activity, as reported pursuant to Section 202.

(2) Beaufort Sea. Vessels transiting east of Bullen Point to the Canadian border should remain at least five (5) miles offshore during transit along the coast, provided ice and sea conditions allow.

(3) Chukchi Sea. Vessels should remain as far offshore as weather and ice conditions allow, and at all times at least five (5) miles offshore during transit.

(4) Safe Harbor / Loitering. Notwithstanding paragraphs 2 and 3, from August 31 to October 31 vessels in the Chukchi Sea or Beaufort Sea shall remain at least 20 miles offshore of the coast of Alaska from Icy Cape in the Chukchi Sea to Pitt Point on the east side of Smith Bay in the Beaufort Sea whether in transit or engaging in activities in support of oil and gas operations unless ice conditions or an emergency that threatens the safety of the vessel or crew prevents compliance with this requirement.

(d) Vessel Speeds.

Vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowhead whales or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.

(e) Vessels Operating in Proximity of Bowhead Whales.

If any vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:

(1) reducing vessel speed to less than 5 knots within 900 feet of the whale(s);

(2) steering around the whale(s) if possible;

(3) operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;

(4) operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and

(5) checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

(f) Marine Mammal Sighting Data.

Industry Participants whose operations are subject to this title will submit to the AEWC and NSB DWM all marine mammal sighting data.

TITLE VII – PARTICIPANTS

This Agreement shall be binding and effective when signed by the duly authorized representatives of the Participants. Signatures may be by facsimile on separate pages.

George Noongwook
AEWC Chairman
Dated: _____

Harry Brower, Jr.
AEWC Commissioner for Barrow
Dated: _____

Merlin Koonooka
AEWC Commissioner for Gambell
Dated: 12/13/13

Joseph Kaleak
AEWC Commissioner for Kaktovik
Dated: _____

Raymond Hawley
AEWC Commissioner for Kivalina
Dated: _____

Ronald Ozenna, Jr.
AEWC Commissioner for Little Diomede
Dated: _____

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AEWC Chairman
Dated: _____

Harry Brower, Jr.
AEWC Commissioner for Barrow
Dated: 6 March 2013

Merlin Koonooka
AEWC Commissioner for Gambell
Dated: _____

Joseph Kaleak
AEWC Commissioner for Kaktovik
Dated: _____

Raymond Hawley
AEWC Commissioner for Kivalina
Dated: _____

Ronald Ozenna, Jr.
AEWC Commissioner for Little Diomede
Dated: _____

907- 852-2303 FAX

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AEWC Commissioner for Barrow
Dated: _____

Merlin Koonooka
AEWC Commissioner for Gambell
Dated: _____

Joseph Kaleak
Joseph Kaleak
AEWC Commissioner for Kaktovik
Dated: 3-12-13

Raymond Hawley
AEWC Commissioner for Kivalina
Dated: _____

Ronald Ozenna, Jr.
AEWC Commissioner for Little Diomede
Dated: _____

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Merlin Koonooka
AEWC Commissioner for Gambell
Dated: _____

Joseph Kaleak
AEWC Commissioner for Kaktovik
Dated: _____

Raymond Hawley
AEWC Commissioner for Kivalina
Dated: 3-14-13

Ronald Ozenna, Jr.
AEWC Commissioner for Little Diomede
Dated: _____

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AEWC Commissioner for Gambell
Dated: _____

Joseph Kaleak
AEWC Commissioner for Kaktovik
Dated: _____

Raymond Hawley
AEWC Commissioner for Kivalina
Dated: _____

Ronald Ozenna
Ronald Ozenna, Jr.
AEWC Commissioner for Little Diomede
Dated: March 27-13

Isaac Nukapigak
AEWC Commissioner for Nuiqsut
Dated: 3/11/13

Rex A. Rock, Sr.
AEWC Commissioner for Pt. Hope
Dated: _____

Julius Rexford
AEWC Commissioner for Pt. Lay
Dated: _____

John Hopson, Jr.
AEWC Commissioner for Wainwright
Dated: _____

Luther Komonaseak
AEWC Commissioner for Wales
Dated: _____

Isaac Nukapigak
AEWC Commissioner for Nuiqsut
Dated: _____

Rex A. Rock, Sr.
AEWC Commissioner for Pt. Hope
Dated: 3/15/2013

Julius Rexford
AEWC Commissioner for Pt. Lay
Dated: _____

John Hopson, Jr.
AEWC Commissioner for Wainwright
Dated: _____

Luther Komonaseak
AEWC Commissioner for Wales
Dated: _____

Isaac Nukapigak
AEWC Commissioner for Nuiqsut
Dated: _____

Rex A. Rock, Sr.
AEWC Commissioner for Pt. Hope
Dated: _____

Julius Rexford
AEWC Commissioner for Pt. Lay
Dated: _____

John Hopson, Jr.
AEWC Commissioner for Wainwright
Dated: _____

Luther Komonaseak
AEWC Commissioner for Wales
Dated: _____

Isaac Nukapigak
AEWC Commissioner for Nuiqsut
Dated: _____

Rex A. Rock, Sr.
AEWC Commissioner for Pt. Hope
Dated: _____

Julius Rexford
AEWC Commissioner for Pt. Lay
Dated: _____

John Hopson, Jr.
AEWC Commissioner for Wainwright
Dated: 3/12/13

Luther Komonaseak
AEWC Commissioner for Wales
Dated: _____

Isaac Nukapigak
AEWC Commissioner for Nuiqsut
Dated: _____

Rex A. Rock, Sr.
AEWC Commissioner for Pt. Hope
Dated: _____

Julius Rexford
AEWC Commissioner for Pt. Lay
Dated: _____

John Hopson, Jr.
AEWC Commissioner for Wainwright
Dated: _____

Luther Komonaseak
AEWC Commissioner for Wales
Dated: 03-14-13

Name: BP Exploration (Alaska) Inc. Dated: _____	Name: ENI US Operating Company Dated: _____
Name: Exxon Mobil Corporation Dated: _____	Name: GX Technology Corp. Dated: _____
Name: Pioneer Natural Resources Alaska Dated: _____	Name: Shell Offshore, Inc. Dated: June 10, 2013
Name: SAExploration Dated: _____	Name: TGS Dated: _____

ATTACHMENT I -- LOCAL SAR CONTACTS

LOCAL SEARCH AND RESCUE ORGANIZATIONS -

CONTACT PERSONS

(IN EMERGENCIES, ALWAYS DIAL 911)

North Slope Borough
Search and Rescue (Pilots)

Director Hugh Patkotak		852-2822 WK 852-4844 Home

Barrow Volunteer
Search and Rescue Station 852-2808 OFS

President	Oliver Leavitt	852-7032 WK 852-7032 Home
Vice-Pres.	Price Brower	852-8633 WK 852-7848 Home
Secretary	Lucille Adams	852-0250 Wk 852-7200 Home
Treasurer	Eli Solomon	852-2808 Wk 852-6261 Home
Coordinator	Arnold Brower, Jr.	852-0290 WK 852-5060 Home
Director	Jimmy Nayakik	852-0200 WK 852-JENS Home

Director	Johnny Adams	852-0250 WK 852-7724 Home

Nuiqsut Volunteer
Search and Rescue Station 480-6613 (Fire Hall)

Kaktovik Volunteer
Search and Rescue Station 640-6212 (Fire Hall)

President	Lee Kayotuk	640-5893 Wk 640-6213 Home
Vice-Pres.	Tom Gordon	640-
Secretary	Nathan Gordon	640-6925
Treasurer	Don Kayotuk	640-2947
Fire Chief	George T. Tagarook	640-6212 WK 640-6728 Home

APPENDIX D: DESCRIPTION OF VESSELS AND EQUIPMENT

During the 2013 open-water season, the vessels *Fennica* and *Nordica* were used to conduct the shallow hazards and ice gouge surveys, and the equipment retrieval operations. Both vessels operated somewhat specifically in the Chukchi and Sea; however, some transit between the Chukchi and Bering seas was required for resupply and crew change operations, and for delays in the work schedule due to weather and ice forecasts. The following document includes the description of the vessels.

Information included in this document is referenced from Shell's Offshore Alaska Exploration Vessels webpage[1].

Primary Vessels

M/V Fennica

Survey vessel

The *Fennica* served as the sole survey vessel for the shallow hazards and ice gouge surveys. The *Fennica* had the capability of working in thick ice, however all of Shell's 2013 operations were conducted in ice-free seas.

[1]http://www.shell.us/aboutshell/projects-locations/alaska/events-news/02152012-vessels.html#textwithimage_19

Additional Information

The *Fennica* towed a 40 in³ airgun cluster (4 × 10 in3 airguns) at ~2 m (~7 ft) depth and ~23 m (~75 ft) behind the vessel in a rectangular configuration. A single airgun in the array was used as the mitigation gun and was fired between lines to discourage marine mammals from approaching the vessel.

The higher frequency survey equipment included an Edgetech 3200 sub-bottom profiler, an Edgetech 4200 dual frequency side-scan sonar, a Reson 7101 multi-beam echosounder, a marine magnetic SeaSpy magnetometer, and a Skipper GDS 101S single-beam echosounder. The sub-bottom profiler was towed at 10 m (33 ft) depth and 10 m (33 ft) behind the vessel, and the side-scan sonar was towed approximately 91 m (~300 ft) behind the vessel at 20 m (66 ft) depth. The single-beam and multi-beam echosounders were mounted directly under the Fennica's hull. Please refer to Chapter 3 for detailed descriptions of the operating frequencies of all sound sources operated during the seismic surveys and general vessel operations.

Main Upgrade Elements

- Helideck
- New emissions equipment
- ROVs
- Capping stack
- Remote BoP equipment

Vessel Information and Specifications

- Length: 380.5 ft
- Width: 85 ft
- Draft: 27.5 ft
- Accommodations: 77
- Maximum Speed: 16 knots
- Owner/Operator: Arctia Offshore

M/V Nordica

Equipment retrieval vessel

The *Nordica* served as the sole equipment retrieval vessel. Although Shell's 2013 equipment retrieval was conducted in ice free seas, the *Nordica* had the capability to work in thick ice.

Additional Information

An Oceaneering Millennium® Plus ROV, equipped with both a camera with fiber optic video transmission as well as the Fugro Chance Inc. Coda© Echoscope Dual Frequency 3D Sonar, was lowered into the water column to assess the well site. It was determined that approximately two meters of silt had accumulated in the mud line cellar (MLC) since October 2012, covering the manifold and other equipment installed at the end of the 2012 drilling season. An Oceaneering GTO® Subsea Dredge was deployed in conjunction with the Millennium ROV to vacuum out the MLC.

Vessel Information and Specifications

- Length – 380.5 ft.
- Accommodations – 77
- Maximum speed – 16 knots
- Owned/Operated by Arctia Offshore
- 3 bow thrusters
- Main crane hook capacity – 160 tons
- Secondary crane hook capacity – 5 tons

APPENDIX E: CUMULATIVE SOUND EXPSOURE

Shallow Hazards and Ice Gouge Survey, Chukchi Sea

The cumulative SELs received at each AMAR from the airgun pulses of the SSV described in Chapter 3 were calculated without M-weighting and with Type I and Type II M-weighting. The results for AMAR A were shown in Chapter 3, results for AMAR B and C are shown in this Appendix. The cumulative SEL at a fixed position increased with the number of recorded pulses as the survey vessel traversed the track line and passed the CPA. Beyond the CPA, the weaker pulses contributed little to the cumulative SELs, which plateaued. These cumulative SELs represent the exposure to an animal that would have remained stationary at AMAR A throughout the exposure as the airgun operated along the entire SSV track.

Airgun Array—10-in³ Configuration

Figure E.1 and Figure E.2 are plots of the cumulative SELs from the 10 in^3 airgun as received at AMAR B and AMAR C, respectively. The total cumulative SELs for each hearing group are listed in Table E.1 and Table E.2. The total cumulative SEL did not reach the proposed cSEL thresholds (see Chapter 3) at the closest measured ranges of 210 m (690 ft, AMAR B) and 2 km (1.2 mi, AMAR C).

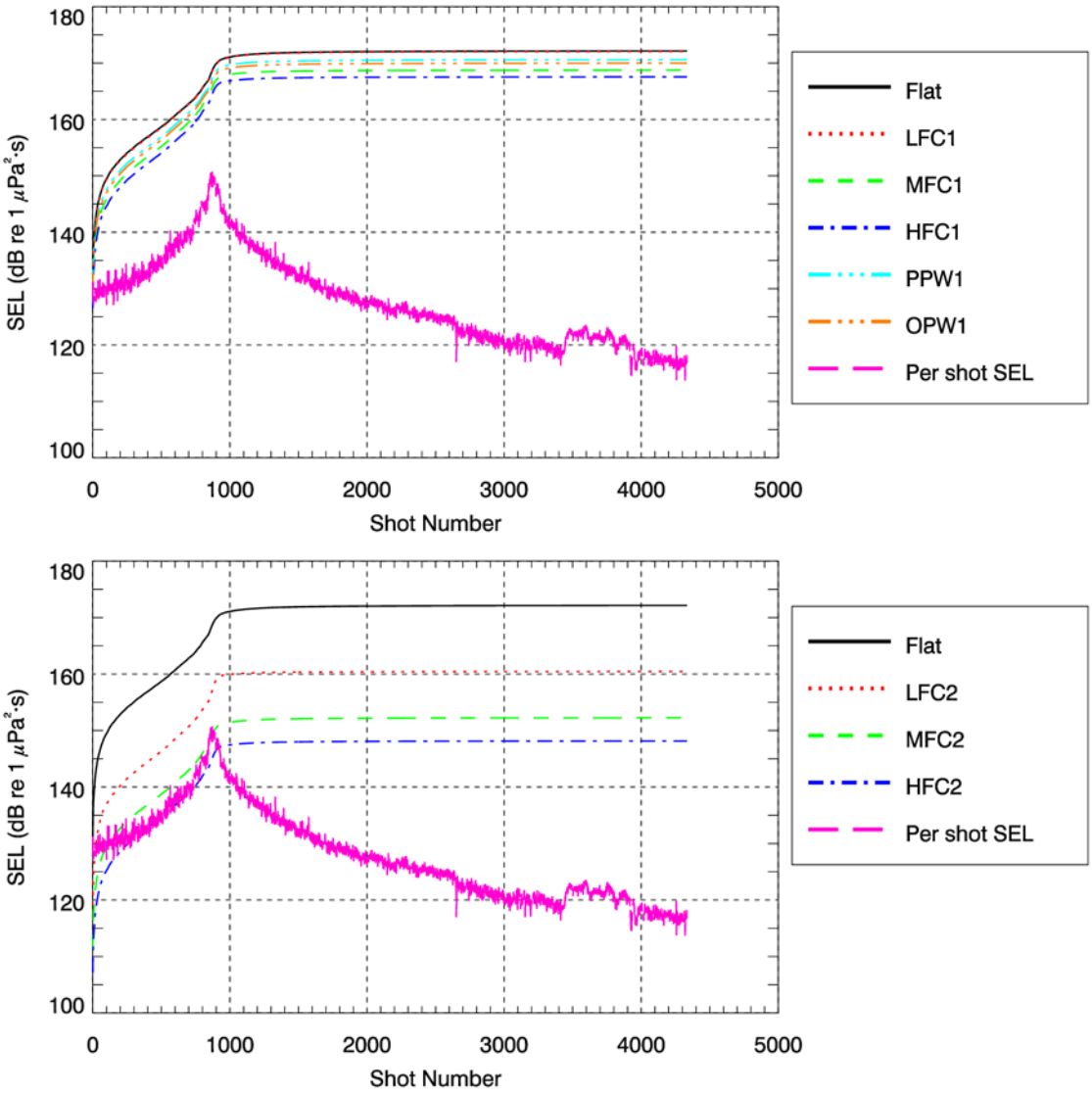

FIGURE E.1. Per-shot and cumulative sound exposure levels received at AMAR B (210 m [690 ft] CPA) as a function of airgun shot number as the 10 in^3 airgun array transited the SSV test track. Flat-weighted (i.e., unweighted) and Type I (top) and Type II (bottom) M-weighted cumulative SELs are shown.

TABLE E.1. Total cumulative sound exposure levels received at AMAR B (210 m [690 ft] CPA), without M-weighting and with Type I and Type II M-weighting, from the 10 in^3 airgun array.

Functional hearing group	Maximum cSEL (dB re 1 $\mu Pa^2 \cdot s$)	
	Type I M-weighting	Type II M-weighting
Flat	172.1	
LFC1	172.0	-
MFC1	168.7	-
HFC1	167.5	-
PPW1	170.6	-
OPW1	170.0	-
LFC2	-	160.4
MFC2	-	152.3
HFC2	-	148.1

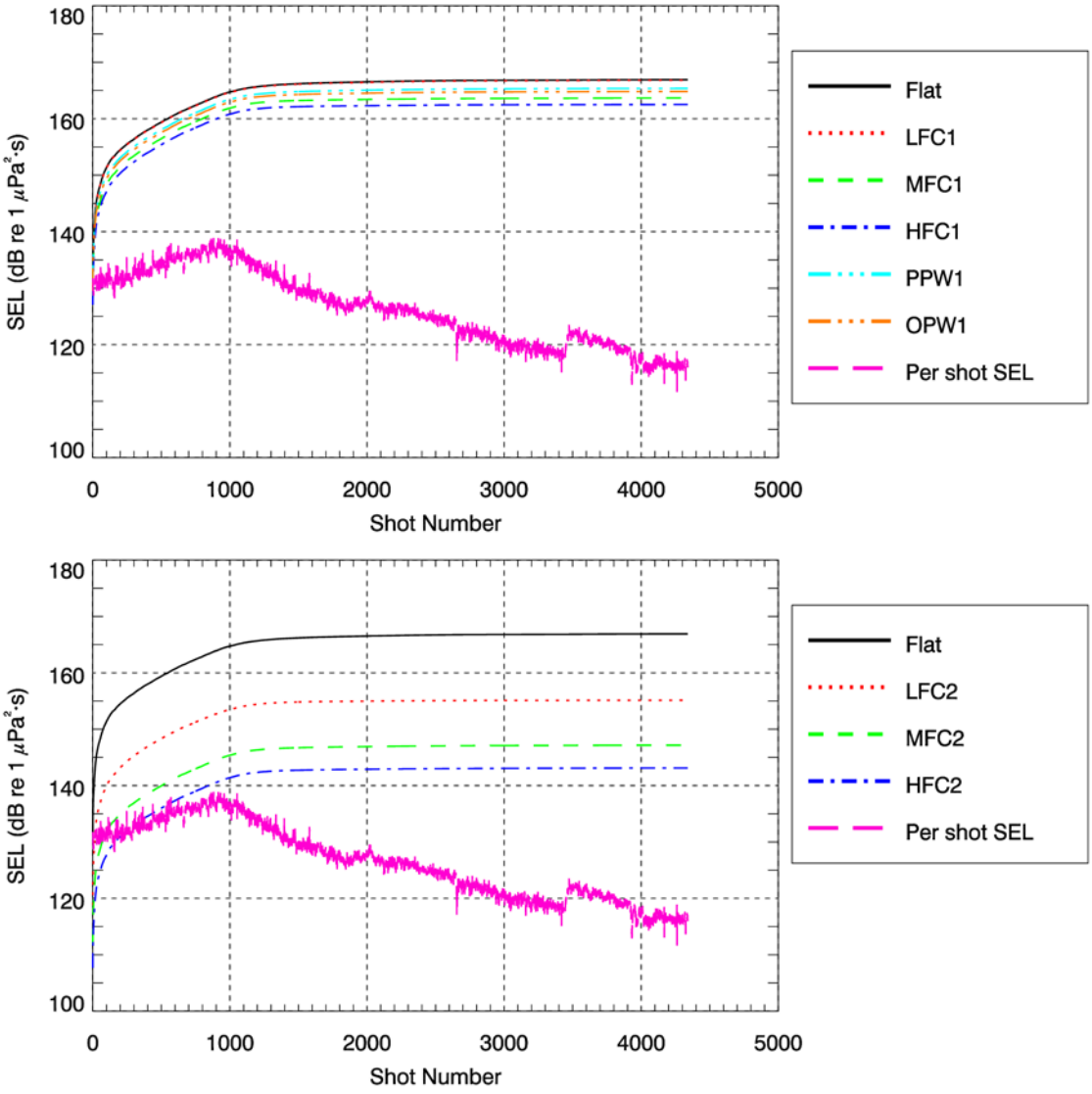

FIGURE E.2. Per-shot and cumulative sound exposure levels received at AMAR C (2 km [1.2 mi] CPA) as a function of airgun shot number as the 10 in^3 airgun array transited the SSV test track. Flat-weighted (i.e., unweighted) and Type I (top) and Type II (bottom) M-weighted cumulative SELs are shown.

TABLE E.2. Total cumulative sound exposure levels received at AMAR C (2 km [1.2 mi] CPA), without M-weighting and with Type I and Type II M-weighting, from the 10 in³ airgun array.

Functional hearing group	Maximum cSEL (dB re 1 µPa²·s)	
	Type I M-weighting	Type II M-weighting
Flat	166.9	
LFC1	166.8	-
MFC1	163.7	-
HFC1	162.5	-
PPW1	165.4	-
OPW1	164.8	-
LFC2	-	155.1
MFC2	-	147.2
HFC2	-	143.1

Airgun Array—20-in³ Configuration

Figure E.3 and Figure E.4 are plots of the cumulative SELs from the 20 in^3 airgun array as received at AMAR B and AMAR C, respectively. The total cumulative SELs for each hearing group are listed in Table E.3 and Table E.4. The total cumulative SEL did not reach the proposed cSEL thresholds (see Chapter 3) at the closest measured ranges of 220 m (720 ft, AMAR B) and 2 km (1.2 mi, AMAR C).

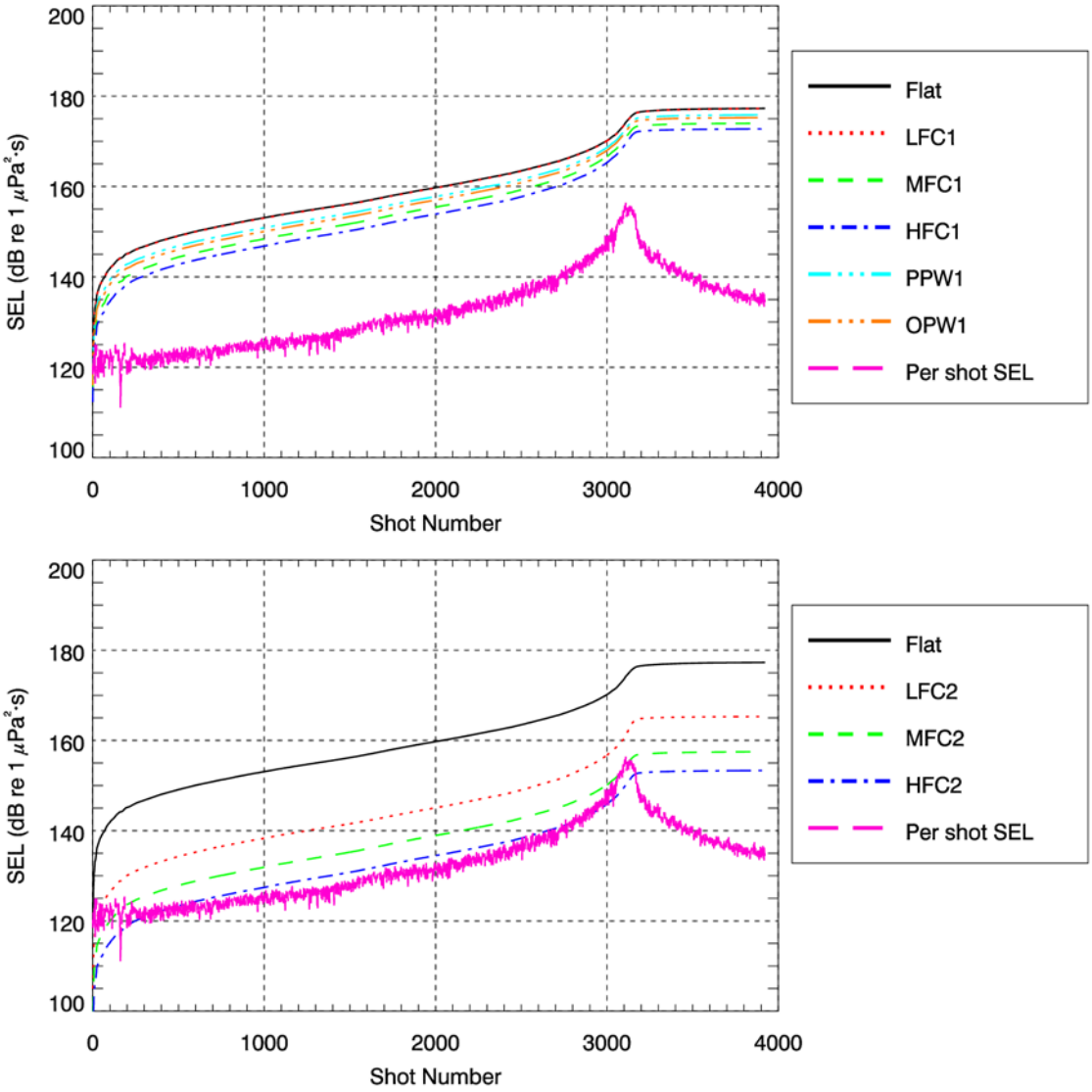

FIGURE E.3. Per-shot and cumulative sound exposure levels received at AMAR B (220 m [720 ft] CPA) as a function of airgun shot number as the 20 in^3 airgun array transited the SSV test track. Flat-weighted (i.e., unweighted) and Type I (top) and Type II (bottom) M-weighted cumulative SELs are shown.

TABLE E.3. Total cumulative sound exposure level (cSEL) received at AMAR B (220 m [720 ft] CPA), without M-weighting and with Type I and Type II M-weighting, from the 20 in^3 airgun array.

Functional hearing group	Maximum cSEL (dB re 1 $\mu Pa^2 \cdot s$)	
	Type I M-weighting	Type II M-weighting
Flat	177.3	
LFC1	177.2	-
MFC1	174.0	-
HFC1	172.7	-
PPW1	175.9	-
OPW1	175.2	-
LFC2	-	165.3
MFC2	-	157.5
HFC2	-	153.3

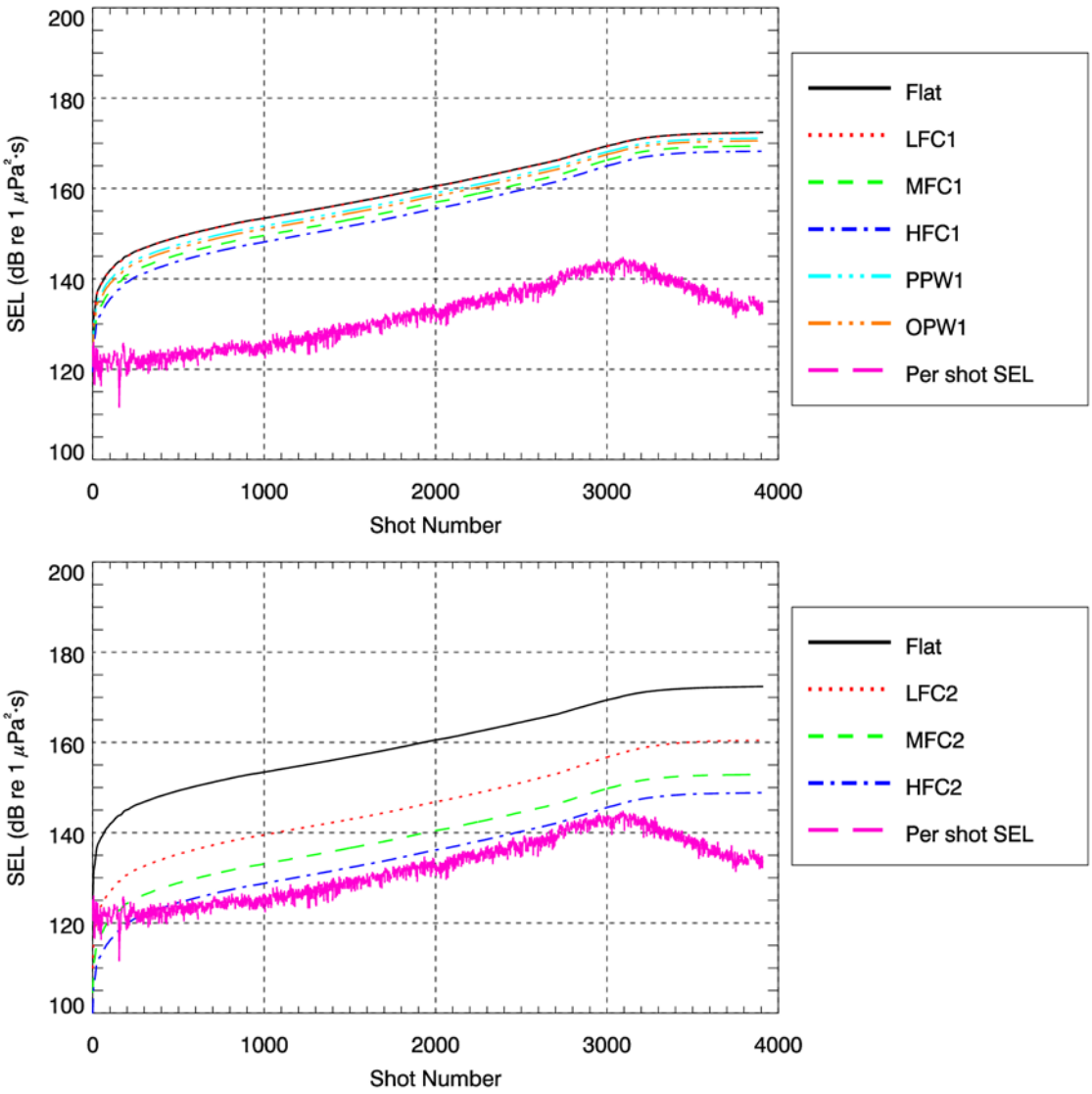

FIGURE E.4. Per-shot and cumulative sound exposure levels received at AMAR C (2 km [1.2 mi] CPA) as a function of airgun shot number as the 20 in^3 airgun array transited the SSV test track. Flat-weighted (i.e., unweighted) and Type I (top) and Type II (bottom) M-weighted cumulative SELs are shown.

TABLE E.4. Total cumulative sound exposure level (cSEL) received at AMAR C (2 km [1.2 mi] CPA), without M-weighting and with Type I and Type II M-weighting, from the 20 in³ airgun array.

Functional hearing group	Maximum cSEL (dB re 1 µPa²·s)	
	Type I M-weighting	Type II M-weighting
Flat	172.4	
LFC1	172.3	-
MFC1	169.4	-
HFC1	168.2	-
PPW1	171.1	-
OPW1	170.6	-
LFC2	-	160.5
MFC2	-	152.9
HFC2	-	148.8

Airgun Array—40-in³ Configuration

Figure E.5 and Figure E.6 are plots of the cumulative SELs from the 40 in^3 airgun array as received at AMAR B and AMAR C, respectively. The total cumulative SELs for each hearing group are listed in Table E.5 and Table E.6. The total cumulative SEL did not reach the proposed cSEL thresholds (see Chapter 3) at the closest measured ranges of 220 m (720 ft, AMAR B) and 2 km (1.2 mi, AMAR C).

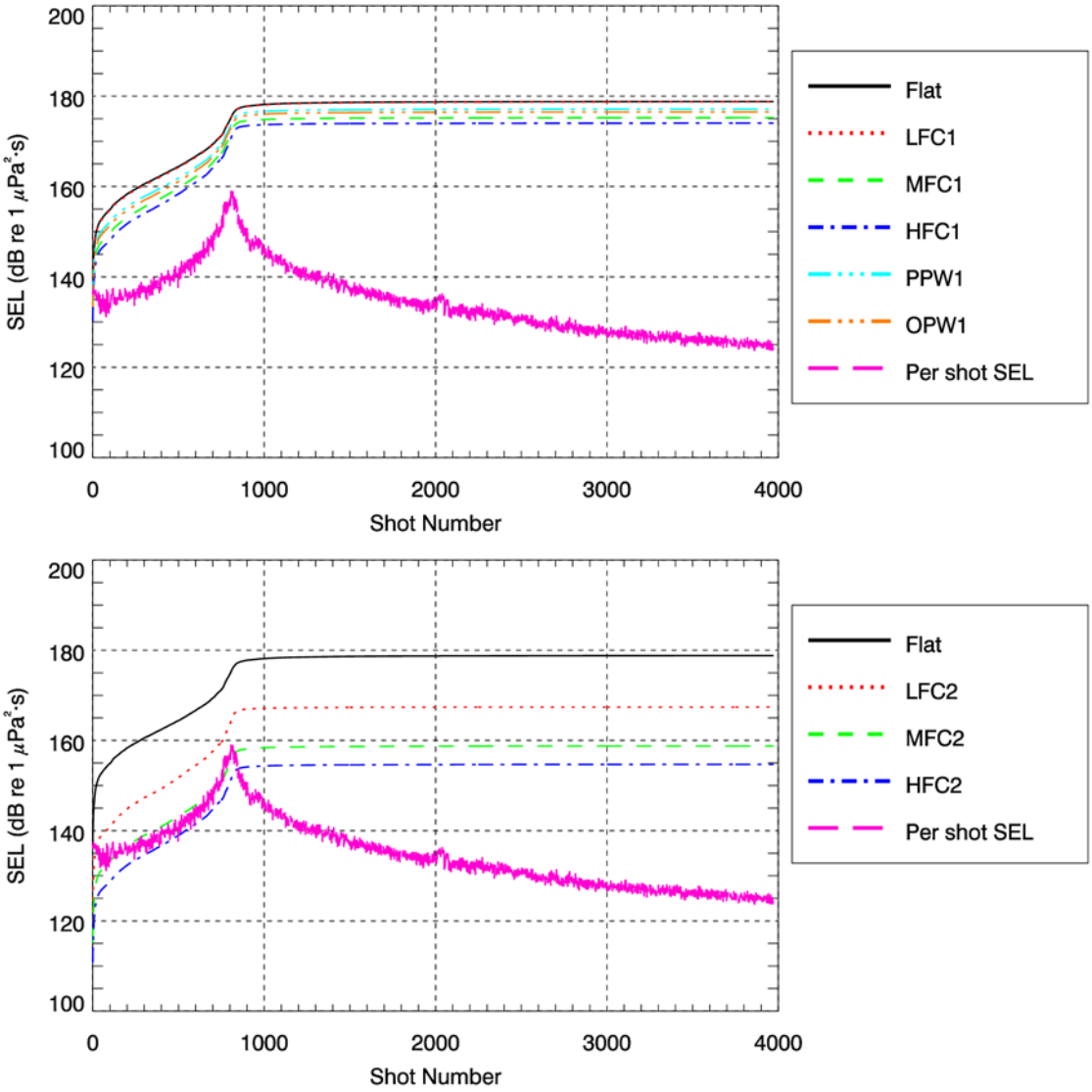

FIGURE E.5. Per-shot and cumulative sound exposure levels received at AMAR B (220 m [720 ft] CPA) as a function of airgun shot number as the 40 in^3 airgun array transited the SSV test track. Flat-weighted (i.e., unweighted) and Type I (top) and Type II (bottom) M-weighted cumulative SELs are shown.

TABLE E.5. Total cumulative sound exposure levels received at AMAR B (220 m [720 ft] CPA), without M-weighting and with Type I and Type II M-weighting, from the 40 in^3 airgun array.

Functional hearing group	Maximum cSEL (dB re 1 $\mu Pa^2 \cdot s$)	
	Type I M-weighting	Type II M-weighting
Flat	178.8	
LFC1	178.7	-
MFC1	175.2	-
HFC1	174.0	-
PPW1	177.1	-
OPW1	176.5	-
LFC2	-	167.4
MFC2	-	158.8
HFC2	-	154.7

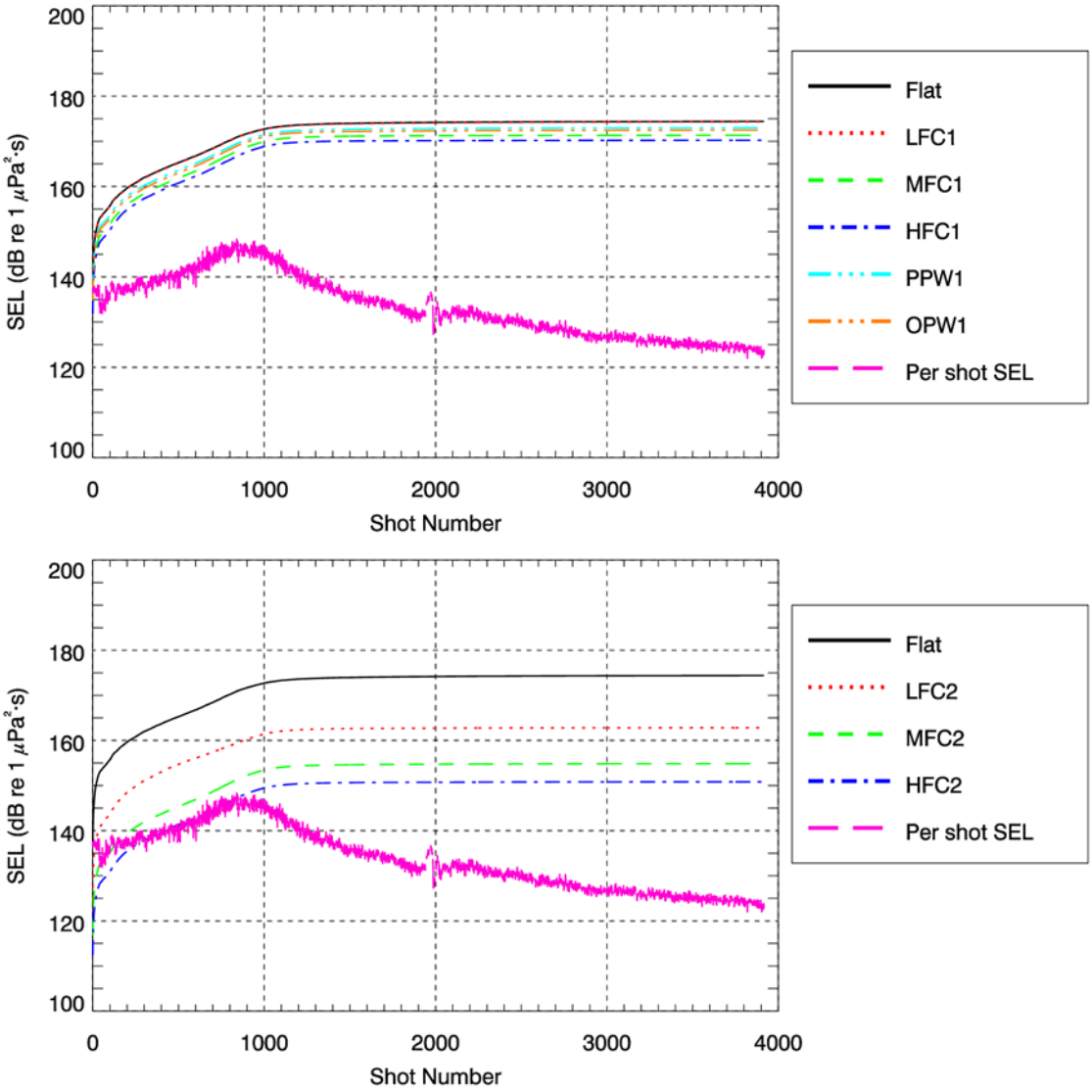

FIGURE E.6. Per-shot and cumulative sound exposure levels received at AMAR C (2 km [1.2 mi] CPA) as a function of airgun shot number as the 40 in^3 airgun array transited the SSV test track. Flat-weighted (i.e., unweighted) and Type I (top) and Type II (bottom) M-weighted cumulative SELs are shown.

TABLE E.6. Total cumulative sound exposure levels received at AMAR C (2 km [1.2 mi] CPA), without M-weighting and with Type I and Type II M-weighting, from the 40 in³ airgun array.

Functional hearing group	Maximum cSEL (dB re 1 µPa²·s)	
	Type I M-weighting	Type II M-weighting
Flat	174.4	
LFC1	174.3	-
MFC1	171.3	-
HFC1	170.2	-
PPW1	173.0	-
OPW1	172.4	-
LFC2	-	162.8
MFC2	-	154.8
HFC2	-	150.8

APPENDIX F: DETAILS OF MONITORING, MITIGATION, AND ANALYSIS METHODS

This appendix provides details on the standard visual monitoring methods and data analysis techniques implemented for this project. Five marine mammal observers (PSOs) were aboard the shallow hazards and ice gouge survey vessel, M/V *Fennica,* and five PSOs were aboard the equipment recovery and maintenance operations vessel, M/V *Nordica,* throughout each cruise. Three PSOs on the *Fennica* and three on the *Nordica* were biologists experienced in marine mammal identification and observation methods and the other two PSOs on each vessel were Inupiat with experience identifying Arctic marine mammals during previous surveys in the Alaskan Chukchi and Beaufort seas. PSOs generally worked 2–4 h shifts for up to 12 h per day.

All PSOs participated in extensive safety training and a three day observer training course designed to familiarize them with permit stipulations, monitoring and mitigation protocols, operational and data recording procedures, and reporting requirements. Prior to the start of the season for both the *Fennica* and *Nordica* (and once mid-season for the *Fennica*), respectively, Shell conducted field leadership forums involving lead PSOs and key vessel personnel (e.g., captains and officers) to discuss project roles and responsibilities along with permit stipulations, monitoring requirements, and mitigation measures. PSO duties included:

- recording environmental and sighting conditions;
- searching for and identifying marine mammals, and recording their numbers, distances from the vessel, and behavior;
- recording possible reactions of marine mammals during the shallow hazards and ice gouge surveys, and equipment recovery and maintenance operations; and
- initiating mitigation measures when necessary and appropriate per Shell's NMFS IHA and USFWS LOA.

Visual Monitoring for Marine Mammals

During the shallow hazards survey, at least one PSO onboard the seismic source vessel *Fennica* maintained a visual watch for marine mammals 24 h per day while airguns were in use. Similarly, at least one PSO aboard the *Nordica* maintained a visual watch during all dynamic positioning operations at the Burger well site. Seismic operations on the *Fennica* were suspended or amended when marine mammals were observed within, or about to enter, designated exclusion zones described in the permits. In general, observations for marine mammals from the *Fennica* were conducted using the following guidelines:

- Observations during daylight hours were conducted in good and poor visibility whenever the airgun(s) were operating, and by two observers whenever possible, unless precluded by safety considerations.
- PSOs observed during transit periods without airgun operations, when conditions permitted, to obtain baseline data on marine mammal distribution and (in the case of less experienced observers) to become more familiar with monitoring and mitigation protocols.
- Two PSOs observed for 30 min prior to the planned start of seismic operations after an extended shut down and the entirety of the≥180 re 1 μPa-m dB (rms) radius was required to be visible for those 30 min.
- PSOs also recorded locations and movements of other vessels when on watch; information regarding vessels as well as marine mammals was recorded in a database.

Observers focused their search effort forward and to the sides of each vessel while they were under way but also searched aft of the vessel and particular attention was given to monitoring of operations that involved deployment and recovery of equipment. PSOs monitored the entire 360 degrees around vessels during stationary periods. Watches were conducted with the unaided eye, Fujinon 7×50 reticle binoculars, Zeiss 20×60 image stabilized binoculars, Fujinon 25×150 "Big-Eye" binoculars, or U.S. Nightvision class 3 night vision goggles. PSO alternated scan sweeps between reticle binoculars (e.g., Fujinon 7 × 50) and the unaided eye during the daytime. PSOs instructed seismic operators to power down or shut down the airguns if marine mammals were sighted within or about to enter applicable exclusion zones.

The duration of a single visual shift was no longer than 4 h to minimize observer fatigue. On the *Fennica*, use of two observers simultaneously was desirable and was scheduled as much as possible to increase detection of marine mammals near the exclusion zones. Similarly, two PSOs were on watch to monitor the zone of influence around the Nordica while it was stationary and using its dynamic positioning system. In addition to the dedicated PSOs, bridge personnel were responsible for detecting marine mammals and implementing mitigation requirements when PSOs were not present on the bridge.

While on watch, PSOs kept systematic electronic records of the vessel's position, activity, and environmental conditions using codes that were entered directly into a database using a notebook-style computer. Vessel and environmental data were recorded in the database every 30 min or whenever conditions changed significantly. Additional data were recorded when marine mammals were observed. For all records, the date and time, vessel position (longitude and latitude), and environmental conditions were recorded. The database was constructed to prevent entry of out-of-range values and codes. Data entries were checked visually by the lead PSO in the field and in the Anchorage office by a validation program.

The following information was recorded for each marine mammal sighting: date, time, species, total number of individuals, number of juveniles, bearing relative to vessel's heading, direction of movement relative to the vessel, distance from the vessel, behavior when sighted, whether animal was in the water or hauled out on ice or land, behavioral pace, potential reaction to the vessel, vessel position, vessel heading, water depth, observer initials, species identification reliability, closest point of approach (CPA), location relative to vessel of CPA, time of CPA, and the times that mitigation measures were requested and implemented (if necessary). Distance to marine mammals was measured from the PSO's location on the bridge rather than from the nominal center of each vessel. The distance of the animal from the airgun array was calculated during data error checking and processing at the end of the season. However, for sightings near or within the exclusion zones in effect at the time, the distance from the marine mammal to the nearest airgun was estimated and recorded for the purposes of implementing power downs or shut downs. The bearing from the vessel to individual or groups of marine mammals was estimated using positions on a clock face, with the bow of the vessel considered to be 12 o'clock and the stern 6 o'clock.

Operational activities that were recorded by PSOs included the number of airguns in use, total volume of the airguns, and the type of vessel activity including dynamic positioning and equipment recovery and maintenance operations. Intra-ship communication between seismic technicians and PSOs was conducted via radio or telephone and used to alert PSOs of any changes in operations, and to request power or shut downs by PSOs. The position of the vessels were logged every 60 sec by GPS and these data were integrated with the marine mammal database to reduce data recording errors. Details regarding the seismic activities (start and stop times, number of guns firing, etc.) was collected from the airgun operators and incorporated into the PSO database.

Marine Mammal Mitigation During Operations

The primary mitigation measures identified for shallow hazards survey operations involving airguns included ramp up, delayed ramp up, power down, and shut down of the airguns. These measures are standard procedures during seismic surveys. Mitigation also included those measures specifically identified in the IHA and LOA, including measures for routine maritime activities such as transit. These general mitigation measures included reduction in speed and course alterations. Seismic and general vessel-based mitigation measures are described below.

Ramp Up

A ramp up is a process only used by seismic vessels that involves a gradual increase in the number of airguns firing from none or one airgun until the full array is active. A ramp up from no airguns cannot be initiated during times when the full safety radii are not visible to PSOs for 30 minutes while a ramp up from one airgun can be initiated during times when the full safety radius is not visible because the mitigation gun has been firing.

During daylight hours, a ramp up was required when the full airgun array had not been operating for a period of >10 min. A 30 min watch period performed by at least two PSOs was required prior to a ramp up. The entire ≥180 dB (rms) safety radius for the full array must be visible for the entire 30-min pre-ramp up observation period before the ramp up could commence. However, if the mitigation airgun had been operating during the break in full array activity, then a ramp up could be initiated at any time provided two PSOs were on active watch during the power up. If the airguns had been shut down or powered down because of the presence of a marine mammal within or near the applicable safety radius, a ramp up or power up could not begin until that safety radius was clear of marine mammals. Following a marine mammal sighting, the safety radius was considered clear when the marine mammal was observed outside of the safety radius, or if the marine mammal(s) were not seen in the safety radii again for 15 min (for small odontocetes and pinnipeds) or 30 min (for mysticetes, large odontocetes and Pacific walruses). If a marine mammal was observed within the applicable safety radius during the 30-min pre-ramp up observation period, the airgun operator was informed and the ramp up was postponed.

Ramp ups of the airgun array began with firing a single airgun. The number of airguns firing was then increased at a rate no greater than an increase of ~6 dB (rms) per 5-min period. For the *Fennica*, the ramp up duration was between 10 and 15 min depending on whether the single "mitigation" gun was already firing. During a power up the same procedure was applied by increasing the number of operating guns from the single mitigation airgun to the full array. During a ramp up or power up, the exclusion zone for the full airgun array was maintained even though fewer airguns were operating.

PSOs informed the airgun operators when ramp up could proceed. If a marine mammal was observed within its applicable safety radius during the 30-min observation period, or during the ramp up, the bridge and airgun operators were informed, as usual, of any necessary mitigation measures (i.e. power down or shutdown).

In addition to the standard safety radii based on the ≥190 and ≥180 dB (rms) distances for pinnipeds and cetaceans, NMFS and USFWS required Shell to monitor the ≥160 dB (rms) radius for aggregations of 12 or more non-migratory bowhead or gray whales and Pacific walruses during all seismic activities. Due to the relatively small size of the ≥160 dB (rms) zone, observers aboard the *Fennica* could monitor this area without the need for observers on additional vessels. Power down or shut down procedures were to be implemented if groups of 12 or more bowhead whales, gray whales, or Pacific walruses were observed within the ≥160 dB (rms) radius while the airguns were in operation.

Power Down

A power down is a reduction in the number of operating airguns (usually from all airguns firing to a single mitigation airgun firing). If marine mammals were detected outside the applicable exclusion zone of the full airgun array but were likely to enter the exclusion zone (i.e., if the mammals were moving towards the vessel or if the vessel was moving in the direction of the mammals), and if the vessel's course or speed could not be changed to avoid having the mammals enter the exclusion zone, the airgun array was powered down to the single mitigation airgun before the mammals were within the full array exclusion zone. Likewise, if a mammal was first observed already within the full array exclusion zone, the airguns were immediately powered down. The mitigation airgun continued firing at a source level of at least 180 dB (rms) during the interruption of full array seismic operations. A shut down (see below) was implemented only if a marine mammal was detected within or about to enter the smaller exclusion zone around the mitigation airgun. Full airgun activity did not resume (via a power up) until the marine mammal had cleared the exclusion zone of the full array.

Shut Down

A shut down is the cessation of all airgun activity, including the single mitigation airgun. If a cetacean or pinniped was detected within or about to enter the applicable exclusion zone of the mitigation gun, the airgun was shut down. After a shut down, the animal must have cleared the exclusion zone before start up procedures could begin. If the mitigation airgun was shut down for >10 min, then at least 30 min of observation by two PSOs was necessary prior to ramp up. PSOs informed the bridge when ramp up of the airgun(s) could proceed.

Reduction of Speed

If a marine mammal was sighted outside of the applicable safety radius, and a reduction in speed would allow the animal to pass the area without entering the safety radius, then a PSO can ask the vessel operator to reduce the speed of the vessel. The *Fennica,* however, was already operating at minimum speed and had reduced maneuverability due to the seismic gear it was towing, therefore only seismic mitigations (i.e. power downs, shut downs) were implemented during seismic operations. This mitigation measure may also be requested during transit for both the *Fennica* and *Nordica* as a means to comply with the stipulations of Shell's IHA and LOA.

Course Alteration

If a marine mammal was detected outside the applicable exclusion zone and, based on its position and direction of travel, was likely to enter the exclusion zone, one possible mitigation measure was to adjust the ship track and/or speed to avoid close approach to the mammal. However, while the streamer(s) and airgun(s) are being towed behind the vessel, the turning rate of the vessel is very limited, and course alteration is generally not a practical mitigation method for a seismic vessel. Instead, the marine mammal's activities and movements relative to the seismic vessel were closely monitored. If the mammal appeared likely to enter the safety radius, further mitigation actions were taken, i.e., power or shut down of the airgun(s). Course alteration also was a measure requested during general vessel activities from both the *Fennica* and *Nordica,* particularly to avoid groups of cetaceans and close encounters with marine mammals ahead of the vessel trackline.

Other Mitigation

Other mitigation measures implemented by PSOs included postponement of equipment deployments from the *Nordica* (e.g., remotely operated underwater vehicles) due to the presence of marine mammals in the deployment area, and relocation of the *Fennica* for helicopter operations to an area without feeding whales in close proximity.

Analyses

Marine Mammal Monitoring

This section describes the analyses of the marine mammal sightings and survey effort recorded during this project. It also describes the methods used to calculate densities and estimate the number of marine mammals potentially exposed to airgun sounds associated with Shell's shallow hazards survey and equipment recovery and maintenance operations.

The sightings and effort data were analyzed separately for each vessel. Data collected from the *Fennica* were grouped into two categories, or bins, to assess potential effects of seismic sounds on marine mammals. These categories were designed to distinguish potential differences in distribution, abundance, and behavior of marine mammals between "seismic" and "non-seismic" periods based on the whether or not airgun activity was occurring. Sighting and observer effort data from the *Nordica* were categorized into three primary bins. These included periods while the vessel was operating in dynamic positioning, general vessel activity (e.g., transit), and idle vessel activity (e.g., drifting). These categories were selected to distinguish potential differences of sighting rates or marine mammal behavior between the activities of the *Nordica.*

As summarized in Chapter 4, marine mammal density was one of the variables examined to assess differences in the distribution of marine mammals relative to the survey vessels between seismic and non-seismic periods. Densities were calculated using line-transect procedures for vessel-based surveys (Buckland et al. 2001). To allow for animals missed during observations, we corrected our visual observations using correction factors calculated with these procedures.

Line Transect Density Estimates

The line transect estimator described by Buckland et al. (2001) was used to estimate densities. This estimator included an additional bias correction factor for animals missed on the track-line:

$$D_{ij} = \frac{n'_{ij}\,\bar{S}_{ij}\,f(0)_{ij}}{2L_{ij}\,p(0)}$$

Where:

D	is the density of a species (numbers of animals / km^2);
$f(0)$	is the species specific sighting probability density function at zero perpendicular distance;
$p(0)$	is the species specific bias correction factor, which corrects the density estimate for animals missed on the trackline;
i	denotes seasons: Jun–Aug or Sep–Nov;
j	denotes received sound pressure level category (<120 dB, or >160dB), and;
n'	is the total number of sightings for each category:

$$n'_{ij} = \sum_{m=1}^{M_{ij}} n(m)_{ij}$$

Where:

m	represents a unique sampling unit, defined as a segment of trackline surveyed on a given day, for a given season and sound pressure level combination (here-after 'sighting-effort' category);
M	is the total number of survey days for a given sighting-effort category, and;
$n(m)$	is the number of sightings of a certain species in the m^{th} sampling unit for each sighting-effort category.

The average group size $\bar{S}$ for each sighting-effort category was given by:

$$\bar{S}_{ij} = \frac{\sum_{x=1}^{X_{ij}} s(x)_{ij}}{X_{ij}}$$

Where:

x	represents an individual sighting for a given sighting-effort category;
X	is the total number of sightings for a given sighting-effort combination, and;
$s(x)$	is the number of individuals in the x^{th} sighting for a given sighting-effort category.

The total effort for each effort category was given by:

$$L_{ij} = \sum_{m=1}^{M_{ij}} l(m)_{ij}$$

Where:

$l(m)$	is the length of useable track-line covered for a given effort category.

The variance of *n'* and $\bar{S}$ was given as:

$$Var\left[n'_{ij}\right] = \frac{L_{ij}\sum_{m=1}^{M_{ij}}\left[l(m)_{ij}\left(n(m)_{ij}/l(m)_{ij} - n'_{ij}/L_{ij}\right)^2\right]}{M_{ij}-1}$$

$$Var\left[\bar{S}_{ij}\right] = \frac{\sum_{x=1}^{X_{ij}}\left(s(x)_{ij} - \bar{S}_{ij}\right)^2}{X_{ij}-1}$$

There was no uncertainty for *L*, no uncertainty was assumed for *p*(0), and the variance for *f(0)* was taken from similar studies when available (see discussion of *f*(0) values below, under *Corrections for Sightability*). When there was only one sighting for a sighting-effort category, the variance for $\overline{S}$ could not be estimated. For these situations, we multiplied the maximum coefficient of variation (CV) observed across all species and cells within the species grouping (i.e., cetaceans or pinnipeds) times $\overline{S}$ and squared the product to approximate the variance. Borrowing the highest relative variance likely overestimates the variances in question, but was considered a conservative remedy for dealing with unknown uncertainty.

The variance of *D* was propagated from all input variances using the delta method:

$$Var\left[D_{ij}\right] = D_{ij}^2\left\{\frac{Var\left[n'_{ij}\right]}{n'^2_{ij}} + \frac{Var\left[f(0)\right]}{f(0)^2} + \frac{Var\left[\overline{S}_{ij}\right]}{\overline{S}_{ij}^2}\right\}$$

Because the distribution of *D* is truncated at zero and hence positively skewed, we assumed *D* was log-normally distributed when estimating the lower (LCL) and upper (UCL) 95% confidence limits:

$$LCL_{ij} = \frac{D_{ij}}{\exp\left[z_\alpha\sqrt{\ln\left(1+\frac{Var\left[D_{ij}\right]}{D_{ij}^2}\right)}\right]}$$

$$UCL_{ij} = D_{ij}\exp\left[z_\alpha\sqrt{\ln\left(1+\frac{Var\left[D_{ij}\right]}{D_{ij}^2}\right)}\right]$$

Consequently, the confidence interval around *D* was not symmetrical, but had a greater chance of capturing the true density. Note that z_α = 1.96 above, corresponding to 95% confidence limits.

Corrections for Sightability

The following two parameters were included in the calculation of densities:

- *p*(0), the bias correction factor. This factor corrects the density estimate for animals not detected on the trackline.
- *f*(0), the probability density function for detection on the trackline, which is the reciprocal of the effective strip-half width (Buckland et al. 2001). This parameter accounts for decreasing detectability as a function of perpendicular distance from the trackline.

The bias correction values for cetaceans were taken from previous studies. Where species-specific values did not exist for this correction factor, values for similar species were used. The *p*(0) value for most cetaceans (0.902) was taken from Forney and Barlow (1998). This value is based on estimates for humpback, fin, and blue whales that were calculated from double-observer data collected off the coast of California. In the absence of better data, these estimates were applied to bowhead, gray and unidentified whales in this study. The estimate for minke whales (0.84) and harbor porpoise (0.787) comes from

Table 4 in Barlow and Gerrodette (1996). The best available correction factor for pinnipeds (0.6) was taken from Bengtson et al. (2005) based on a study that involved the use of satellite-linked time-depth recorders to study the haulout patterns of ringed seals. In the absence of better data specific to each species, this correction factor was applied to all pinniped species.

The $f(0)$ values and corresponding variances used in this analysis were mostly taken to be equal to values estimated from recent data collected in Alaskan waters from vessels of similar heights (observation platform >11 m or 36 ft), and using the same observational methods (Hartin et al. 2011; Table F.1, Figures F.1 – F.4). The exceptions were the values used for minke whales and harbor porpoise, which were taken to be equal to the values from Barlow and Gerrodette (1996) and Forney and Barlow (1998), respectively. In the case of minke whales and harbor porpoise, no estimates of $Var[f(0)]$ were available. Instead the approach described above, for calculating missing values for the variance of $\overline{S}$, was used (i.e. using the maximum CV of available cetacean $f(0)$ values).

Table F.1. $f(0)$ values and associated sample sizes, and upper and lower 95% confidence intervals used in density estimates for Shell's 2013 survey and equipment maintenance activities.

			95% Confidence Limits	
Species	*n*	*f* (0)	Lower	Upper
Bearded seal	39[a]	3.414	2.706	4.307
Ringed seal	101[b]	4.661	3.857	5.633
Spotted seal	101[b]	4.661	3.857	5.633
Unidentified seal	101[b]	4.661	3.857	5.633
Unidentified pinniped	39[a]	3.414	2.706	4.307
Pacific walrus	220	2.718	2.243	3.295
Bowhead Whale	32[c]	1.010	0.703	1.451
Gray whale	32[c]	1.010	0.703	1.451
Minke whale[d]	-	0.369	-	-
Unidentified mysticete whale	32[c]	1.010	0.703	1.451
Harbor porpoise[e]	-	0.369	-	-
Unidentified Whale	32[c]	1.010	0.703	1.451

[a] Includes sightings of bearded seals and "unidentified pinnipeds"

[b] Includes sightings of, ringed seal, spotted seal, and "unidentified seals"

[c] Includes sightings of gray whales and "unidentified mysticete whales"

[d] f(o) taken from Barlow and Gerrodette 1996

[e] f(o) taken from Forney and Barlow 1998

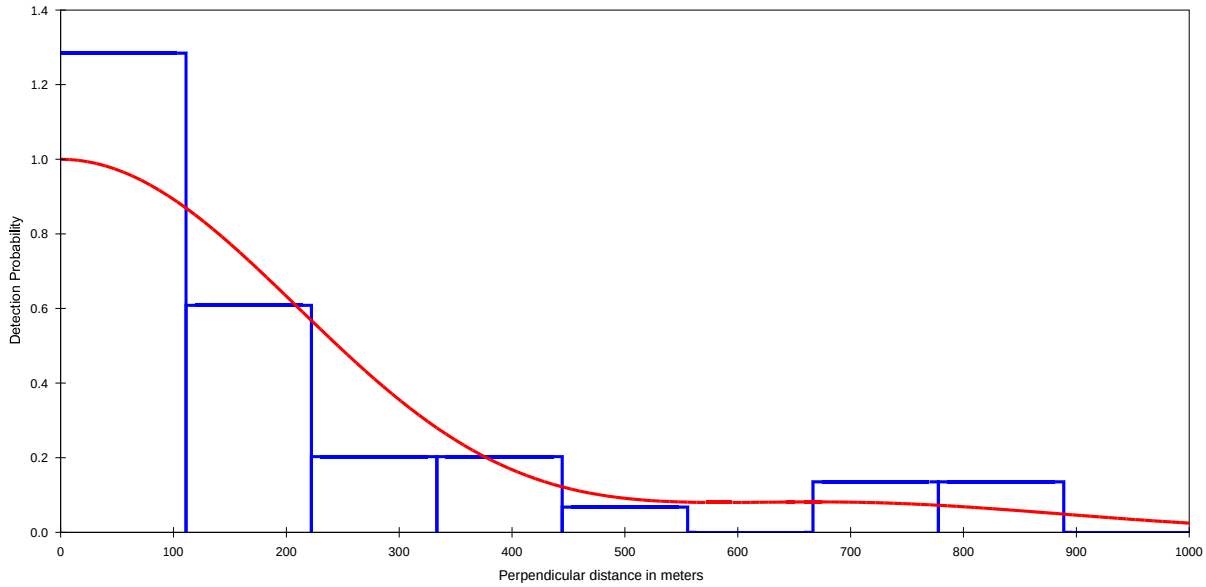

Figure F.1. Detection function (red line) plotted on a histogram showing the frequency of counts at the indicated distances of bearded seal and "unidentified pinniped" sightings from "Tall" vessels (observer eye height >11 m or 36 ft) in 2006–2011. The model selected had a half-normal key function with cosine expansion and right truncation at 1000 m, n = 39.

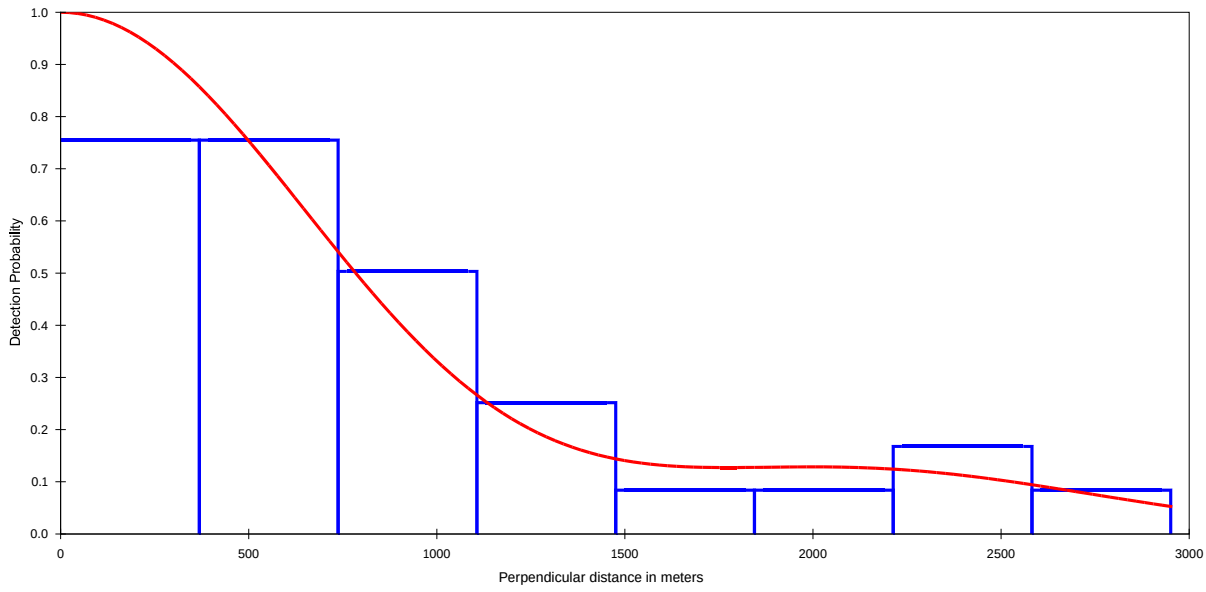

Figure F.2. Detection function (red line) plotted on a histogram showing the frequency of counts at the indicated distances of bowhead whale, gray whale, and "unidentified mysticete whale" sightings from "Tall" vessels (observer eye height >11 m or 36 ft) in 2006–2011. The model selected had a half-normal key function with cosine expansion, n = 32.

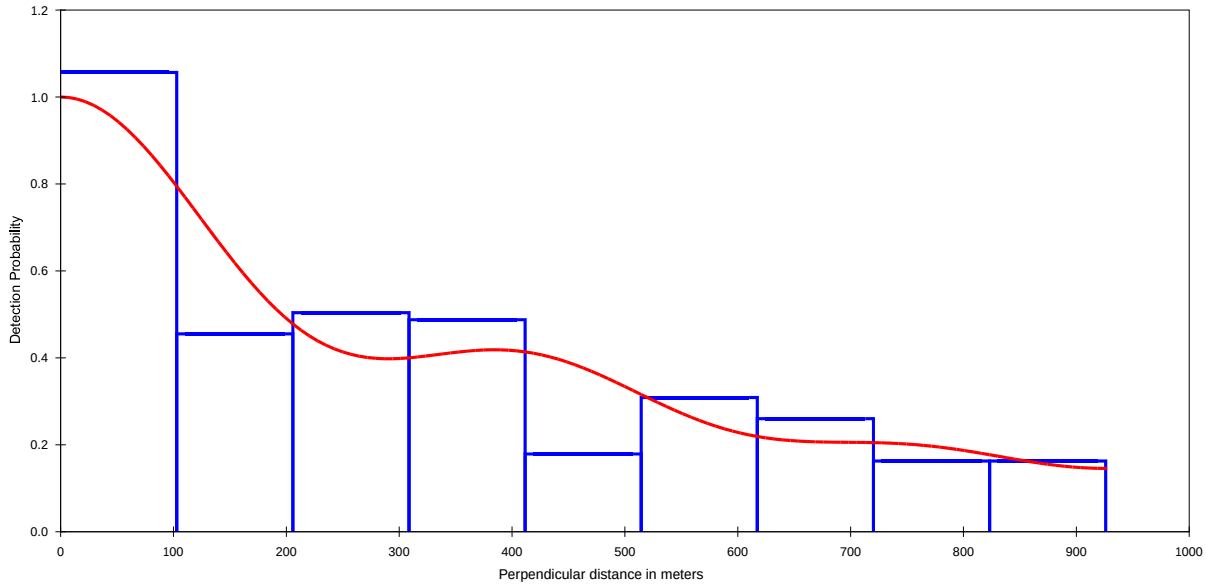

Figure F.3. Detection function (red line) plotted on a histogram showing the frequency of counts at the indicated distances of Pacific walrus sightings from "Tall" vessels (observer eye height >11 m or 36 ft) in 2006–2011. The model selected had a uniform key function with cosine expansion and a right truncation of 10% (926 m) of the sightings, *n* = 220.

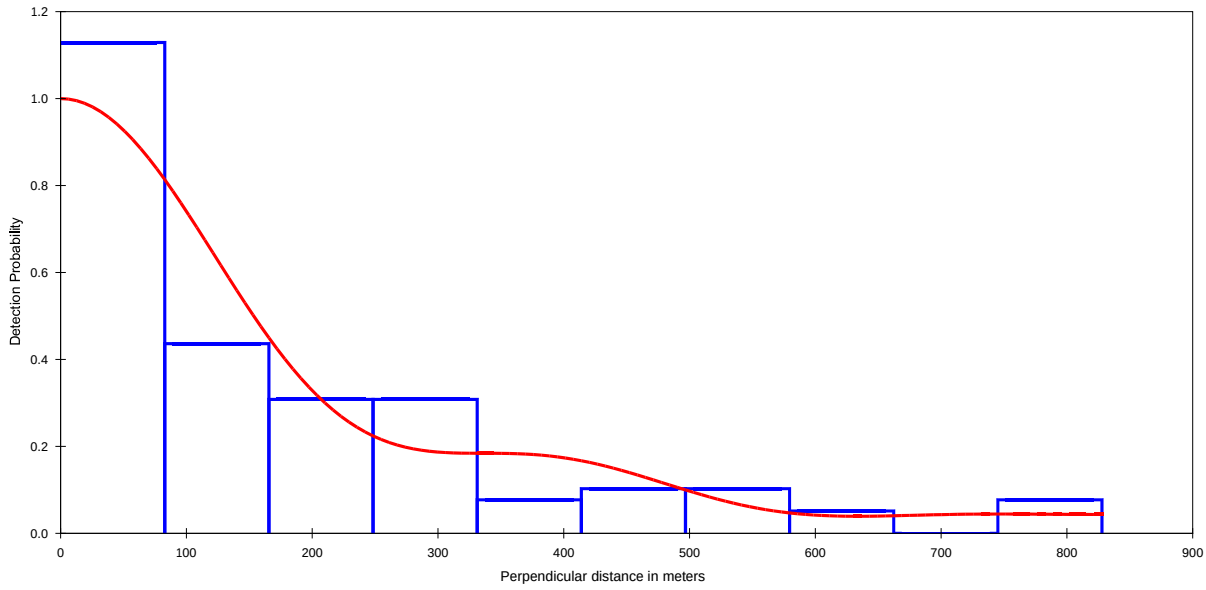

Figure F.4. Detection function (red line) plotted on a histogram showing the frequency of counts at the indicated distances of ringed seal, spotted seal, and "unidentified seal" sightings from "Tall" vessels (observer eye height >11 m) in 2006–2011. The model selected had a uniform key function with cosine expansion and a right truncation of 5% (828 m) of the sightings, *n* = 101.

Number of Individuals Exposed

NMFS and USFWS practice in situations with intermittent impulsive sounds like seismic pulses has been to assume that "take by harassment" (Level B harassment) may occur if marine mammals are exposed to received sound levels exceeding 160 dB re 1 μPa rms (NMFS 2005, 2006; USFWS 2008). For continuous sounds, like those created by the dynamic positioning, Level B harassment is assumed to occur at received levels ≥120 dB re 1 μPa rms. When calculating the number of mammals potentially affected as described below, we used the measured ≥160 dB (rms) distances from the seismic source shown in Table 4.1 (1.3 km or 0.81 mi), and the measured ≥120 dB (rms) distance from the *Nordica* during dynamic positioning shown in Table 4.2 (4.5 km or 2.8 mi).

Three primary methods were used to estimate the number of pinnipeds and cetaceans exposed to sound levels that may have caused disturbance or other effects. The methods were:

(A) minimum estimates based on direct observations during seismic surveys by the *Fennica* and dynamic positioning activities by the *Nordica* at Burger;

(B1) estimates based on densities calculated from data collected from the two vessels during good visibility conditions and **non-seismic** periods multiplied by the area of water exposed to seismic sounds ≥160 dB (rms) or dynamic positioning sounds ≥120 dB (rms) during all operations in Jul–Aug, *plus* the respective densities and periods in Sep;

(B2) estimates based on densities calculated from data collected from the two vessels during good visibility conditions when **seismic** operations were ongoing multiplied by the area of water exposed to seismic sounds ≥160 dB (rms) or dynamic positioning sounds ≥120 dB (rms) during all operations in Jul–Aug, *plus* the respective densities and periods in Sep;

(C1) for dynamic positioning sounds only, estimates based on densities calculated from data collected from the two vessels during good visibility conditions and **non-seismic** periods multiplied by the area of water exposed to dynamic positioning sounds ≥120 dB (rms) during all operations in Jul–Aug multiplied by 11 to account for the 11 days on which dynamic positioning occurred in those months, *plus* the respective densities and periods in Sep multiplied by nine to account for the nine days on which dynamic positioning occurred during Sep; and

(C2) for dynamic positioning sounds only, estimates based on densities calculated from data collected from the two vessels during good visibility conditions when **seismic** operations were ongoing multiplied by the area of water exposed to dynamic positioning sounds ≥120 dB (rms) during all operations in Jul–Aug multiplied by 11 to account for the 11 days on which dynamic positioning occurred in those months, *plus* the respective densities and periods in Sep multiplied by nine to account for the nine days on which dynamic positioning occurred during Sep.

As noted above, separate density estimates were calculated from data collected during seismic and non-seismic periods or locations. The use of non-seismic densities in method (B1) provides an estimate of the number of animals that presumably would have been present in the absence of seismic activities. The use of seismic densities in method (B2) provides an estimate of the number of animals that were likely present in the area of seismic activity during this project. In cases where seismic densities are lower than non-seismic densities, the difference between the two estimates could be taken as an estimate of the number of animals that moved in response to the operating seismic vessel, or that changed their behavior sufficiently to affect their detectability by visual observers. In cases where seismic densities are greater than non-seismic densities, it suggests that individuals of that species did not move in response to the operating seismic vessel, or that they altered their behavior in such a way that made them more detectable by visual observers (e.g. increased their time spent at the surface). The actual number of

individuals exposed to, and potentially affected by, seismic survey or dynamic positioning sounds was likely between the minimum and maximum estimates resulting from methods (A) and (B1) or (B2).

Method (B1) above provided an estimate of the number of animals that would have been exposed to airgun sounds at various levels if the seismic activities did not influence the distribution of animals near the activities. However, it is known that some animals are likely to have avoided the area near the seismic vessel while the airguns were firing (see Richardson et al. 1995, 1999; Stone and Tasker 2006; Gordon et al. 2004; Smultea et al. 2004, Funk et al. 2008). Within the ≥160 dB (rms) radii around the seismic source (i.e., 1.3 km [0.81 mi]), the distribution and behavior of cetaceans and pinnipeds may have been altered as a result of the seismic survey. These effects could occur because of reactions to the active airgun array, or to other sound sources or other vessels working in or transiting through the area.

Density estimates for each species group were used to estimate the number of animals potentially affected by seismic and dynamic positioning operations (methods B1 and B2). In the case of airgun sounds from site survey activities, this involved multiplying the following three values:

- km of seismic survey;
- width of area assumed to be ensonified to ≥160 dB (rms) by pulsed airgun sounds (2 × ≥160 dB measured radius), counting the areas ensonified on more than one occasion only once; and
- densities of marine mammals estimated from data collected during this survey as described above.

The ensonified area used in the above calculations for seismic exposures did not include multiple counts of the same area of water that was exposed on multiple occasions. Areas within the seismic survey area may have been ensonified by airgun sounds multiple times during the site surveys because survey transect lines were spaced closer together than twice the measured ≥160 dB distance (2 × 1.3 km = 2.6 km or 1.6 mi). The ratio of the area of water ensonified including multiple counts of areas exposed more than once to the area of water ensonified excluding multiple counts of areas exposed more than once represents the average number of times a given area of water was ensonified to the specified level. If an animal remained at the survey site through the duration of the survey activities it would have been, on average, exposed an equivalent number of times.

This approach was originally developed to estimate numbers of seals potentially affected by seismic surveys in the Alaskan Beaufort Sea conducted under IHAs (Harris et al. 2001). The method has recently been used in estimating numbers of seals and cetaceans potentially affected by other seismic surveys conducted under IHAs (e.g., Funk et al. 2008; Ireland et al. 2007a,b; Patterson et al. 2007).

In the case of dynamic positioning operations for methods (C1) and (C2), the area ensonified by continuous sounds from the *Nordica's* dynamic positioning system was calculated as the area of a circle with a radius equal to the measured ≥120 dB (rms) distance multiplied by the number of days on which the *Nordica* operated its dynamic positioning system in Jul–Aug (n=11) and Sep (n=9). The resulting product of ensonified area times the daily multiplier for each seasonal period was then multiplied by the respective marine mammal density estimates for each seasonal period. This daily multiplier was a conservative measure that assumed complete turnover of the marine mammal populations in the area each day, and likely overestimates the number of animals exposed to dynamic positioning sounds ≥120 dB (rms). Shell's IHA application for 2013 also used this alternative approach as an upper estimate of marine mammal exposures from dynamic positioning sounds (Shell 2013).

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APPENDIX G: BEAUFORT WIND FORCE DEFINITIONS

Wind Speed		Beaufort Wind Force	World Meteorological Organization Terms	Wave Height (m)	Description
Knots	m/s				
<1	<0.5	0	Calm	0	Glassy like a mirror
1-3	0.5-1.5	1	Light air	<0.1	Ripples with the appearance of scales but no whitecaps or foam crests
4-6	2.1-3.1	2	Light breeze	0-0.1	Small wavelets, crests have a glassy appearance but do not break (no whitecaps)
7-10	3.6-5.1	3	Gentle breeze	0.1-0.5	Smooth large wavelets, crests begin to break, occasional/scattered whitecaps
11-16	5.7-8.2	4	Moderate breeze	0.5-1.2	Slight; small fairly frequent whitecaps
17-21	8.7-10.8	5	Fresh breeze	1.2-2.4	Moderate waves becoming longer, some spray, frequent moderate whitecaps
22-27	11.3-13.9	6	Strong breeze	2.4-4	Rough, larger waves, longer-formed waves, many large whitecaps
28-33	14.4-17.0	7	Near gale	4-6	Very rough, large waves forming, white foam crests everywhere, spray is present
34-40	17.5-20.6	8	Gale		
41-47	21.1-24.2	9	Strong gale		
48-55	24.7-28.3	10	Storm	6-9	High
56-63	28.8-32.4	11	Violent storm	11-14	Very high

APPENDIX H: STATUS AND ABUNDANCE OF MARINE MAMMAL SPECIES IN THE CHUKCHI SEA

TABLE H.1. The habitat, abundance and conservation status of marine mammals potentially inhabiting the project areas of the Chukchi Sea.

Species	Habitat	Abundance	ESA[1]	IUCN[2]	CITES[3]
Odontocetes					
Beluga whale (*Delphinapterus leucas*) (Eastern Chukchi Sea Stock)	Offshore, Coastal, Ice edges	3,710[4]	Not listed	NT	–
Beluga whale (Beaufort Sea Stock)	Offshore, Coastal, Ice edges	39,258[5]	Not listed	NT	–
Narwhal (*Monodon monoceros*)	Offshore, Ice edge	Rare[6]	Not listed	NT	–
Killer whale (*Orcinus orca*)	Widely distributed	Uncommon	Not listed	DD	–
Harbor Porpoise (*Phocoena phocoena*) (Bering Sea Stock)	Coastal, inland waters, shallow offshore waters	48,215[4] Common[7]	Not listed	LC	–
Mysticetes Bowhead whale (*Balaena mysticetus*)	Pack ice & coastal	10,545[8] 16,892[9]	Endangered	LC	I
Gray whale (*Eschrichtius robustus*) (eastern Pacific population)	Coastal, lagoons, shallow offshore waters	19,126[10]	Not listed	LC	I
Minke whale (*Balaenoptera acutorostrata*)	Shelf, coastal	Rare	Not listed	LC	I
Fin whale (*Balaenoptera physalus*)	Slope, mostly pelagic	Rare	Endangered	EN	I
Humpback whale (*Megaptera novaeangliae*)	Shelf, coastal	Rare	Endangered	LC	I
Pinnipeds Bearded seal (*Erignathus barbatus*)	Pack ice, shallow offshore waters	155,000[11]	Threatened	LC	–
Spotted seal (*Phoca largha*)	Pack ice, coastal haulouts, offshore	~141,479[12]	Arctic pop. segments not listed	DD	–
Ringed seal (*Pusa hispida*)	Landfast & pack ice, offshore	~208,000-252,000[13]	Threatened	LC	–
Ribbon seal (*Histriophoca fasciata*)	pack ice, offshore	90-100,000[14] 49,000[15]	Not Listed	DD	–

[1] U.S. Endangered Species Act.
[2] Red List of Threatened Species (IUCN 2013). Codes for IUCN classifications: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; DD = Data Deficient
[3] Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2013)
[4] Allen and Angliss (2013)
[5] Beaufort Sea population (Allen and Angliss 2013)
[6] Population in Baffin Bay and the Canadian arctic archipelago is ~60,000 (DFO 2010); very few in Alaska (Allen and Angliss 2013)
[7] Vessel-based observations from Industry activities in 2006–2010 (Hartin et al. 2011)
[8] 2001 B-C-B Bowhead population estimate (Zeh and Punt 2005)
[9] 2011 B-C-B Bowhead population estimate (Givens et al. 2013)
[10] North Pacific gray whale population (Laake et al. 2009)
[11] Beringia Distinct Population Segment (Cameron et al. 2010)
[12] Central and Eastern Bering Sea stock based on aerial surveys in 2007 (Allen and Angliss 2013)
[13] Eastern Chukchi Sea population (Bengtson et al. 2005)
[14] Bering Sea, (Burns 1981a)
[15] Eastern and Central Bering Sea (Allen and Angliss 2013)

APPENDIX I: MARINE MAMMAL MONITORING RESULTS

Section 1: All-sightings Table

Table I.1 All marine mammal detections during Shell's shallow hazards and ice gouge surveys, and equipment recovery in the Chukchi Sea, 2013.

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN20133	Humpback whale	1	0	14/07/13 12:38:00	54.6666	-166.947	699	NO	SW	<120	OT
FEN20134	Northern fur seal	1	0	14/07/13 15:31:00	55.1701	-167.26	100	LO	RE	<120	OT
FEN20135	Northern fur seal	1	0	14/07/13 16:51:00	55.406	-167.409	300	LO	RE	<120	OT
FEN20136	Northern fur seal	1	0	14/07/13 18:25:00	55.686	-167.596	70	CD	LO	<120	OT
FEN20137	Northern fur seal	2	0	14/07/13 20:16:00	55.8897	-168.099	30	NO	PO	<120	OT
FEN20138	Northern fur seal	1	0	14/07/13 22:44:00	56.3393	-168.239	150	CD	TH	<120	OT
FEN20139	Northern fur seal	1	0	14/07/13 22:57:00	56.382	-168.242	75	CD	LO	<120	OT
FEN201310	Northern fur seal	1	0	14/07/13 23:18:00	56.4507	-168.246	75	CD	LO	<120	OT
FEN201311	Unidentified seal	1	0	15/07/13 07:17:00	57.9597	-168.361	50	SP	TH	<120	OT
FEN201312	Harbor porpoise	1	0	16/07/13 14:44:00	63.8644	-167.688	40	NO	SW	<120	OT
FEN201315	Unidentified seal	1	0	18/07/13 08:56:00	70.9488	-167.034	75	LO	SW	<120	DY
FEN201316	Spotted seal	1	0	18/07/13 10:33:00	70.9326	-167.035	100	LO	LO	<120	DY
FEN201317	Unidentified seal	1	0	18/07/13 13:46:00	70.929	-167.048	450	LO	LO	<120	DP

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN201318	Unidentified seal	1	0	18/07/13 16:47:00	70.9335	-166.826	150	LO	LO	≥160	SH
FEN201319	Ringed seal	2	0	18/07/13 21:22:00	70.9319	-166.941	50	LO	SW	≥160	SH
FEN201320	Unidentified seal	1	0	19/07/13 00:08:00	70.9324	-166.928	300	NO	SW	≥160	SH
FEN201321	Unidentified seal	1	0	19/07/13 00:21:00	70.9326	-166.885	75	LO	SW	≥160	SH
FEN201322	Unidentified seal	1	0	19/07/13 01:42:00	70.9359	-166.619	150	NO	SW	≥160	SH
FEN201323	Unidentified seal	1	0	19/07/13 02:22:00	70.937	-166.488	100	NO	SW	≥160	SH
FEN201324	Pacific walrus	3	0	19/07/13 02:35:00	70.9376	-166.451	150	LO	LO	<120	OT
FEN201325	Unidentified seal	1	0	19/07/13 04:54:00	70.9332	-166.867	100	LO	LO	<120	OT
FEN201326	Unidentified seal	1	0	19/07/13 05:30:00	70.932	-166.974	70	LO	LO	<120	OT
FEN201327	Pacific walrus	1	0	19/07/13 09:53:00	70.9305	-167.008	200	LO	DI	<120	OT
FEN201328	Unidentified seal	1	0	19/07/13 12:07:00	70.9293	-167.004	300	LO	LO	<120	OT
FEN201329	Ringed seal	1	0	19/07/13 12:46:00	70.9285	-167.052	150	NO	LO	<120	OT
FEN201330	Unidentified seal	1	0	19/07/13 12:55:00	70.9286	-167.022	175	NO	LO	<120	OT
FEN201331	Unidentified seal	1	0	19/07/13 13:09:00	70.9261	-166.979	200	LO	LO	<120	OT
FEN201332	Unidentified seal	1	0	19/07/13 13:34:00	70.9301	-167.046	60	LO	LO	<120	OT
FEN201333	Ringed seal	2	0	19/07/13 13:59:00	70.9265	-167.051	350	NO	SW	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN201334	Unidentified seal	1	0	19/07/13 14:03:00	70.9269	-167.038	325	LO	SW	<120	OT
FEN201335	Ringed seal	1	1	19/07/13 14:25:00	70.9304	-167.009	150	NO	OT	<120	OT
FEN201336	Ringed seal	1	0	19/07/13 15:01:00	70.9287	-167.029	150	LO	OT	<120	OT
FEN201337	Unidentified seal	1	0	19/07/13 15:34:00	70.9293	-167.036	600	NO	DI	<120	OT
FEN201338	Ringed seal	2	0	19/07/13 15:59:00	70.9269	-167.067	60	LO	OT	<120	OT
FEN201339	Ringed seal	1	0	19/07/13 16:44:00	70.9303	-167.038	35	NO	SW	<120	OT
FEN201340	Bearded seal	1	0	19/07/13 18:27:00	70.9302	-167.021	400	LO	LO	<120	OT
FEN201341	Unidentified seal	1	0	19/07/13 22:00:00	70.9419	-167.035	80	IS	PO	<120	OT
FEN201342	Unidentified pinniped	1	0	19/07/13 23:39:00	70.9615	-167.011	500	NO	SW	<120	OT
FEN201343	Unidentified seal	1	0	19/07/13 23:49:00	70.9702	-166.991	300	LO	LO	<120	OT
FEN201344	Pacific walrus	1	0	20/07/13 13:36:00	71.1376	-166.619	653	NO	DE	<120	DY
FEN201345	Unidentified seal	1	0	21/07/13 05:15:00	70.9744	-167.285	50	NO	DE	<120	OT
FEN201346	Unidentified seal	1	0	21/07/13 08:58:00	70.9976	-167.313	5	NO	DE	<120	OT
FEN201347	Minke whale	1	0	22/07/13 14:02:00	70.9485	-167.199	80	NO	SW	<120	OT
FEN201348	Unidentified seal	1	0	23/07/13 00:47:00	70.9886	-167.247	100	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN201349	Unidentified mysticete whale	1	0	24/07/13 01:50:00	70.961	-167.32	300	NO	BL	≥160	RU
FEN201352	Unidentified seal	1	0	25/07/13 02:05:00	70.999	-167.254	80	LO	LO	≥160	SH
FEN201353	Pacific walrus	1	0	26/07/13 00:22:00	70.9595	-167.319	300	NO	SW	≥160	RU
FEN201354	Ringed seal	1	0	26/07/13 03:27:00	70.983	-167.281	60	CD	LO	≥160	SH
FEN201355	Pacific walrus	1	0	26/07/13 03:34:00	70.9869	-167.261	752	NO	SW	≥160	LS
FEN201356	Unidentified seal	1	0	26/07/13 04:55:00	70.9623	-167.073	300	NO	LO	≥160	SH
FEN201357	Unidentified seal	1	0	26/07/13 07:23:00	70.9969	-167.311	200	NO	SW	<120	OT
FEN201358	Unidentified seal	1	0	26/07/13 08:22:00	70.9763	-167.188	364	NO	SW	<120	OT
FEN201359	Unidentified seal	1	0	26/07/13 10:31:00	70.9364	-167.147	150	NO	SW	<120	OT
FEN201360	Unidentified seal	1	0	26/07/13 11:00:00	70.9612	-167.193	50	NO	SW	<120	OT
FEN201361	Bearded seal	1	0	26/07/13 11:16:00	70.9747	-167.218	300	NO	SW	<120	OT
FEN201363	Bearded seal	1	0	27/07/13 07:20:00	70.996	-167.267	40	LO	TH	<120	OT
FEN201364	Gray whale	1	1	27/07/13 14:03:00	70.975	-167.291	25	LO	OT	<120	OT
NOR20133	Unidentified mysticete whale	4	0	27/07/13 18:59:00	53.9082	-166.491	3273	NO	BL	<120	OT
NOR20134	Humpback whale	3	0	27/07/13 19:19:00	53.9397	-166.485	4000	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR20135	Unidentified mysticete whale	1	0	27/07/13 19:30:00	53.9728	-166.495	5031	NO	BL	<120	OT
NOR20136	Humpback whale	4	0	27/07/13 19:39:00	54	-166.502	3273	NO	BL	<120	OT
NOR20137	Humpback whale	2	0	27/07/13 19:41:00	54.0061	-166.504	2444	NO	FL	<120	OT
NOR20139	Humpback whale	5	0	27/07/13 19:51:00	54.0365	-166.512	3000	NO	BR	<120	OT
NOR20138	Unidentified mysticete whale	2	0	27/07/13 19:51:00	54.0365	-166.512	5031	NO	BL	<120	OT
NOR201310	Humpback whale	1	0	27/07/13 19:54:00	54.0456	-166.515	350	NO	SW	<120	OT
NOR201313	Humpback whale	6	0	27/07/13 19:58:00	54.0553	-166.517	1397	NO	FL	<120	OT
NOR201312	Humpback whale	4	0	27/07/13 20:05:00	54.0758	-166.525	980	NO	BR	<120	OT
NOR201314	Dall's porpoise	3	0	27/07/13 20:38:00	54.1735	-166.555	50	NO	SW	<120	OT
NOR201316	Humpback whale	2	0	27/07/13 20:58:00	54.2354	-166.574	892	NO	BL	<120	OT
NOR201317	Dall's porpoise	3	0	27/07/13 21:08:00	54.2652	-166.583	100	NO	SW	<120	OT
NOR201318	Unidentified mysticete whale	1	0	27/07/13 21:26:00	54.3184	-166.599	5000	NO	BL	<120	OT
NOR201319	Humpback whale	1	0	27/07/13 21:43:00	54.3685	-166.616	1954	NO	FL	<120	OT
NOR201320	Humpback whale	1	0	27/07/13 21:48:00	54.3836	-166.62	1397	NO	BL	<120	OT
NOR201321	Humpback whale	1	0	27/07/13 22:03:00	54.4292	-166.634	818	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR201322	Humpback whale	2	0	27/07/13 22:08:00	54.4445	-166.637	1224	NO	BL	<120	OT
NOR201323	Humpback whale	1	0	27/07/13 22:19:00	54.4779	-166.645	980	NO	FL	<120	OT
NOR201324	Dall's porpoise	2	0	27/07/13 22:26:00	54.4984	-166.654	100	CD	SW	<120	OT
NOR201325	Humpback whale	1	0	27/07/13 22:28:00	54.5045	-166.656	1088	NO	BL	<120	OT
NOR201326	Unidentified mysticete whale	1	0	27/07/13 23:25:00	54.6746	-166.702	500	NO	BL	<120	OT
NOR201327	Minke whale	1	0	28/07/13 08:45:00	56.3755	-167.22	250	CD	BL	<120	OT
NOR201328	Dall's porpoise	6	0	28/07/13 08:51:00	56.3942	-167.227	350	CD	SW	<120	OT
NOR201329	Dall's porpoise	8	0	28/07/13 09:10:00	56.4536	-167.248	1397	NO	SW	<120	OT
NOR201330	Humpback whale	3	0	28/07/13 09:11:00	56.4567	-167.249	3600	NO	BL	<120	OT
NOR201331	Dall's porpoise	5	0	28/07/13 09:20:00	56.4852	-167.258	500	NO	SW	<120	OT
NOR201332	Unidentified seal	1	0	28/07/13 09:21:00	56.4884	-167.259	300	NO	RE	<120	OT
NOR201333	Northern fur seal	1	0	28/07/13 09:30:00	56.517	-167.267	600	NO	RE	<120	OT
NOR201334	Northern fur seal	1	0	28/07/13 09:50:00	56.5785	-167.285	50	LO	LO	<120	OT
NOR201335	Northern fur seal	2	0	28/07/13 09:54:00	56.5917	-167.288	500	NO	RE	<120	OT
NOR201336	Northern fur seal	1	0	28/07/13 10:22:00	56.6787	-167.314	400	NO	RE	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR201338	Northern fur seal	1	0	28/07/13 10:25:00	56.6881	-167.317	350	NO	RE	<120	OT
NOR201337	Northern fur seal	1	0	28/07/13 10:25:00	56.6881	-167.317	50	NO	RE	<120	OT
NOR201339	Northern fur seal	1	0	28/07/13 10:27:00	56.6943	-167.319	100	IS	RE	<120	OT
NOR201340	Unidentified mysticete whale	1	0	28/07/13 10:32:00	56.7098	-167.324	2444	NO	BL	<120	OT
NOR201341	Unidentified mysticete whale	1	0	28/07/13 10:37:00	56.7254	-167.33	655	NO	SW	<120	OT
NOR201342	Northern fur seal	1	0	28/07/13 10:48:00	56.76	-167.342	100	LO	RE	<120	OT
NOR201343	Northern fur seal	1	0	28/07/13 10:53:00	56.7757	-167.347	50	LO	RE	<120	OT
NOR201344	Northern fur seal	1	0	28/07/13 10:58:00	56.7915	-167.352	50	LO	SW	<120	OT
NOR201345	Northern fur seal	2	0	28/07/13 11:03:00	56.8074	-167.357	100	LO	SW	<120	OT
NOR201347	Northern fur seal	1	0	28/07/13 17:10:00	57.7939	-167.681	200	LO	SW	<120	OT
NOR201348	Northern fur seal	1	0	28/07/13 17:18:00	57.8192	-167.69	500	NO	PO	<120	OT
NOR201349	Northern fur seal	1	0	28/07/13 18:13:00	57.9942	-167.752	100	NO	PO	<120	OT
NOR201350	Northern fur seal	1	0	28/07/13 19:32:00	58.2496	-167.828	250	NO	RE	<120	OT
NOR201351	Northern fur seal	1	0	28/07/13 19:46:00	58.294	-167.842	250	IS	RE	<120	OT
NOR201352	Northern fur seal	1	0	28/07/13 20:01:00	58.3421	-167.857	50	LO	RE	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR201353	Northern fur seal	1	0	28/07/13 20:21:00	58.4055	-167.877	400	LO	RE	<120	OT
NOR201354	Northern fur seal	1	0	28/07/13 20:59:00	58.5242	-167.914	300	LO	RE	<120	OT
NOR201355	Fin whale	3	0	28/07/13 21:03:00	58.5366	-167.918	500	NO	BL	<120	OT
NOR201356	Fin whale	3	0	28/07/13 21:04:00	58.5397	-167.919	500	NO	MI	<120	OT
NOR201357	Northern fur seal	1	0	28/07/13 21:14:00	58.5656	-167.928	300	NO	RE	<120	OT
NOR201358	Unidentified mysticete whale	1	0	28/07/13 21:33:00	58.6262	-167.946	980	NO	SW	<120	OT
NOR201359	Harbor seal	2	0	28/07/13 21:52:00	58.6883	-167.966	400	LO	LO	<120	OT
NOR201360	Humpback whale	1	0	28/07/13 21:54:00	58.6947	-167.968	550	NO	BL	<120	OT
NOR201361	Unidentified seal	1	0	28/07/13 22:37:00	58.8303	-168.014	200	NO	SW	<120	OT
NOR201362	Unidentified mysticete whale	1	0	28/07/13 22:44:00	58.8527	-168.022	1397	NO	SW	<120	OT
NOR201363	Fin whale	2	0	28/07/13 22:47:00	58.8622	-168.026	818	CD	BL	<120	OT
NOR201364	Fin whale	1	0	28/07/13 22:50:00	58.8718	-168.029	755	NO	SW	<120	OT
NOR201365	Minke whale	1	0	28/07/13 23:16:00	58.9545	-168.055	130	NO	DI	<120	OT
FEN201365	Bearded seal	1	0	29/07/13 00:03:00	71.1156	-166.863	300	SP	TH	<120	OT
NOR201366	Unknown	1	0	29/07/13 07:40:00	60.5211	-168.483	150	NO	OT	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR201367	Harbor porpoise	2	0	29/07/13 17:18:00	62.1302	-168.357	1088	NO	SW	<120	OT
NOR201368	Minke whale	1	0	29/07/13 17:51:00	62.2189	-168.354	300	NO	SW	<120	OT
NOR201369	Harbor porpoise	1	0	29/07/13 21:35:00	62.8325	-168.324	100	CD	SW	<120	OT
NOR201370	Unidentified whale	1	0	30/07/13 00:26:00	63.3272	-168.3	755	NO	OT	<120	OT
NOR201371	Gray whale	1	0	30/07/13 08:56:00	64.7562	-168.407	1397	NO	BL	<120	OT
NOR201372	Unidentified mysticete whale	1	0	30/07/13 09:00:00	64.767	-168.409	3273	NO	BL	<120	OT
NOR201373	Unidentified mysticete whale	2	0	30/07/13 09:04:00	64.7778	-168.41	3956	NO	BR	<120	OT
NOR201374	Unidentified whale	1	0	30/07/13 09:07:00	64.7859	-168.412	2444	NO	BL	<120	OT
NOR201375	Gray whale	1	0	30/07/13 09:15:00	64.8075	-168.416	755	NO	BL	<120	OT
NOR201376	Gray whale	1	0	30/07/13 09:29:00	64.8452	-168.422	1000	NO	BL	<120	OT
NOR201377	Unidentified mysticete whale	2	0	30/07/13 09:44:00	64.8859	-168.43	4000	NO	BL	<120	OT
NOR201378	Gray whale	1	0	30/07/13 09:47:00	64.8941	-168.431	250	NO	BL	<120	OT
NOR201379	Gray whale	1	0	30/07/13 09:50:00	64.9023	-168.433	892	NO	BL	<120	OT
NOR201380	Gray whale	1	0	30/07/13 09:52:00	64.9077	-168.434	1500	NO	BL	<120	OT
NOR201381	Gray whale	1	0	30/07/13 09:57:00	64.9213	-168.437	500	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR201382	Unidentified mysticete whale	1	0	30/07/13 10:02:00	64.935	-168.438	1500	NO	BL	<120	OT
NOR201383	Unidentified mysticete whale	1	0	30/07/13 10:08:00	64.9514	-168.438	3500	NO	BL	<120	OT
NOR201384	Unidentified mysticete whale	1	0	30/07/13 10:16:00	64.9733	-168.438	1300	NO	BL	<120	OT
NOR201385	Gray whale	1	0	30/07/13 10:21:00	64.987	-168.438	3000	NO	BL	<120	OT
NOR201386	Unidentified mysticete whale	1	0	30/07/13 10:29:00	65.009	-168.438	1000	NO	FL	<120	OT
NOR201387	Unidentified mysticete whale	1	0	30/07/13 10:44:00	65.0509	-168.438	1700	NO	BL	<120	OT
NOR201388	Gray whale	1	0	30/07/13 10:46:00	65.0565	-168.438	2000	NO	BL	<120	OT
NOR201389	Unidentified mysticete whale	1	0	30/07/13 10:51:00	65.0705	-168.438	3000	NO	BL	<120	OT
NOR201390	Gray whale	2	0	30/07/13 19:44:00	66.5745	-168.492	2444	NO	FL	<120	OT
NOR201391	Humpback whale	3	0	31/07/13 01:26:00	67.4825	-168.476	492	NO	FL	<120	OT
FEN201366	Bearded seal	1	0	31/07/13 02:04:00	70.6428	-163.661	65	SP	TH	<120	OT
NOR201392	Gray whale	2	0	31/07/13 03:07:00	67.7491	-168.478	615	NO	BL	<120	OT
NOR201393	Gray whale	3	0	31/07/13 03:59:00	67.8854	-168.482	892	CD	FL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR201394	Unidentified mysticete whale	1	0	31/07/13 04:10:00	67.9139	-168.484	1088	NO	BL	<120	OT
NOR201395	Gray whale	2	0	31/07/13 04:12:00	67.9191	-168.484	3273	NO	BL	<120	OT
NOR201396	Gray whale	3	0	31/07/13 04:16:00	67.9294	-168.485	1088	NO	BL	<120	OT
NOR201397	Unidentified mysticete whale	1	0	31/07/13 04:32:00	67.972	-168.489	1954	NO	BL	<120	OT
NOR201398	Unknown	1	0	31/07/13 07:24:00	68.4279	-168.474	400	NO	DE	<120	OT
FEN201367	Ringed seal	1	0	31/07/13 08:28:00	70.4626	-162.493	20	LO	SW	<120	OT
FEN201368	Minke whale	1	0	31/07/13 08:47:00	70.4534	-162.436	900	NO	SW	<120	OT
FEN201369	Ringed seal	1	0	31/07/13 09:09:00	70.4431	-162.369	50	LO	SW	<120	OT
FEN201370	Unidentified seal	1	0	31/07/13 09:43:00	70.4427	-162.37	250	NO	DI	<120	OT
FEN201371	Unidentified seal	1	0	31/07/13 09:56:00	70.4475	-162.411	175	NO	SW	<120	OT
FEN201372	Unidentified seal	2	0	31/07/13 10:09:00	70.4531	-162.426	80	NO	SI	<120	OT
FEN201373	Unidentified seal	1	0	31/07/13 11:05:00	70.4352	-162.238	25	LO	LO	<120	OT
FEN201374	Bearded seal	1	0	31/07/13 11:54:00	70.4254	-162.057	300	NO	SW	<120	OT
FEN201375	Unidentified seal	1	0	31/07/13 12:25:00	70.4192	-161.944	400	LO	LO	<120	OT
FEN201376	Unidentified seal	1	0	31/07/13 12:49:00	70.4151	-161.859	500	NO	DI	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN201377	Bearded seal	1	0	31/07/13 16:09:00	70.4586	-161.661	200	NO	SW	<120	OT
FEN201378	Bearded seal	1	0	31/07/13 16:10:00	70.4591	-161.658	150	NO	LO	<120	OT
FEN201379	Bearded seal	1	0	31/07/13 16:52:00	70.4837	-161.539	100	LO	LO	<120	OT
FEN201380	Minke whale	1	0	31/07/13 17:47:00	70.5166	-161.385	250	NO	SW	<120	OT
FEN201381	Bowhead whale	5	1	31/07/13 19:21:00	70.5725	-161.12	4000	NO	FL	<120	OT
FEN201382	Unidentified whale	1	0	31/07/13 21:04:00	70.6044	-161.043	150	NO	PO	<120	OT
FEN201383	Unidentified seal	1	0	31/07/13 21:53:00	70.64	-161.158	70	NO	DE	<120	OT
FEN201384	Unidentified pinniped	1	0	31/07/13 23:45:00	70.7136	-161.462	25	SP	TH	<120	OT
FEN201385	Unidentified seal	1	0	01/08/13 01:38:00	70.7518	-161.622	60	LO	SW	<120	OT
FEN201386	Unidentified seal	1	0	01/08/13 02:23:00	70.781	-161.746	50	SP	TH	<120	OT
FEN201387	Gray whale	1	0	01/08/13 03:29:00	70.8238	-161.927	1084	NO	FL	<120	OT
NOR201399	Unknown	1	0	01/08/13 04:15:00	71.1375	-163.648	75	SP	OT	<120	OT
FEN201388	Bowhead whale	4	1	01/08/13 06:28:00	70.8546	-161.582	2435	NO	TR	<120	OT
FEN201389	Bearded seal	2	0	01/08/13 06:54:00	70.8378	-161.507	50	NO	SW	<120	OT
FEN201390	Unidentified seal	1	0	01/08/13 07:16:00	70.8245	-161.447	50	LO	SW	<120	OT
FEN201391	Gray whale	3	0	01/08/13 07:52:00	70.821	-161.459	3000	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN201392	Unidentified seal	1	0	01/08/13 08:05:00	70.8237	-161.443	50	NO	SW	<120	OT
FEN201393	Bearded seal	1	0	01/08/13 08:27:00	70.8096	-161.382	75	LO	LO	<120	OT
FEN201394	Gray whale	1	0	01/08/13 08:35:00	70.8045	-161.359	1084	NO	FL	<120	OT
FEN201395	Gray whale	1	0	01/08/13 08:50:00	70.7952	-161.317	653	NO	DI	<120	OT
FEN201396	Unidentified seal	1	0	01/08/13 08:54:00	70.7926	-161.306	986	NO	SW	<120	OT
FEN201397	Gray whale	1	0	01/08/13 08:56:00	70.7913	-161.301	50	NO	DI	<120	OT
FEN201398	Unidentified mysticete whale	1	0	01/08/13 09:15:00	70.7792	-161.247	5015	NO	BL	<120	OT
FEN201399	Unidentified mysticete whale	1	0	01/08/13 10:25:00	70.7332	-161.068	5509	NO	BL	<120	OT
FEN2013100	Unidentified mysticete whale	1	0	01/08/13 10:45:00	70.7462	-161.109	1946	NO	BL	<120	OT
FEN2013101	Unidentified mysticete whale	2	0	01/08/13 10:57:00	70.7397	-161.074	5000	NO	SW	<120	OT
FEN2013102	Unidentified seal	1	0	01/08/13 12:23:00	70.6844	-160.835	150	LO	LO	<120	RC
FEN2013103	Gray whale	2	0	01/08/13 12:48:00	70.6804	-160.814	3262	NO	MI	<120	DY
FEN2013104	Minke whale	1	0	01/08/13 13:59:00	70.6952	-160.831	500	NO	SW	<120	DY
FEN2013105	Ringed seal	1	0	01/08/13 14:43:00	70.7008	-160.905	200	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013106	Ringed seal	1	1	01/08/13 15:13:00	70.6815	-160.822	15	LO	LG	<120	OT
FEN2013107	Ringed seal	1	0	01/08/13 15:30:00	70.6703	-160.773	300	LO	LO	<120	OT
FEN2013109	Minke whale	1	0	01/08/13 15:54:00	70.6542	-160.704	75	NO	SW	<120	OT
FEN2013110	Gray whale	3	0	01/08/13 16:43:00	70.6304	-160.568	2937	NO	BL	<120	OT
FEN2013111	Minke whale	1	0	01/08/13 16:59:00	70.6516	-160.569	3312	NO	SW	<120	OT
FEN2013112	Unidentified seal	1	0	01/08/13 17:01:00	70.6541	-160.568	1763	NO	DI	<120	OT
FEN2013113	Bearded seal	1	0	01/08/13 17:02:00	70.6553	-160.568	860	LO	LO	<120	OT
FEN2013114	Bearded seal	1	0	01/08/13 17:20:00	70.6787	-160.563	576	LO	LO	<120	OT
FEN2013115	Minke whale	1	0	01/08/13 17:23:00	70.6824	-160.563	2435	NO	SW	<120	OT
FEN2013116	Unidentified seal	1	0	01/08/13 17:28:00	70.6887	-160.562	600	NO	LO	<120	OT
FEN2013117	Unidentified seal	1	0	01/08/13 18:22:00	70.7129	-160.553	750	NO	LO	<120	DY
FEN2013118	Minke whale	1	0	01/08/13 18:37:00	70.7129	-160.553	1000	NO	SW	<120	DY
FEN2013119	Spotted seal	9	0	01/08/13 18:46:00	70.7129	-160.553	150	SP	LG	<120	DY
FEN2013120	Unidentified seal	1	0	01/08/13 19:49:00	70.7256	-160.547	60	SP	TH	<120	DY
FEN2013122	Unidentified seal	1	0	01/08/13 19:58:00	70.7395	-160.542	339	NO	SW	<120	DY
FEN2013121	Unidentified seal	1	1	01/08/13 19:58:00	70.7395	-160.542	150	NO	SW	<120	DY

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013123	Unidentified seal	1	0	01/08/13 20:11:00	70.7634	-160.535	300	LO	SW	<120	OT
FEN2013124	Unidentified seal	1	0	01/08/13 20:14:00	70.7701	-160.535	752	NO	SW	<120	OT
FEN2013125	Unidentified seal	1	0	01/08/13 20:19:00	70.7813	-160.534	250	LO	SW	<120	OT
FEN2013126	Bowhead whale	4	1	01/08/13 20:38:00	70.8248	-160.535	3262	NO	TR	<120	OT
FEN2013128	Unidentified seal	2	0	01/08/13 20:50:00	70.851	-160.5	653	NO	MI	<120	OT
FEN2013129	Unidentified seal	1	0	01/08/13 20:52:00	70.8551	-160.491	752	NO	SW	<120	OT
FEN2013130	Unidentified seal	1	0	01/08/13 21:03:00	70.877	-160.443	45	NO	TH	<120	OT
FEN2013131	Bearded seal	1	0	01/08/13 21:21:00	70.9117	-160.359	653	NO	SW	<120	OT
FEN2013132	Unidentified seal	1	0	01/08/13 21:41:00	70.9292	-160.218	1500	NO	SW	<120	OT
FEN2013133	Unidentified seal	1	0	01/08/13 21:43:00	70.9304	-160.203	500	NO	SW	<120	OT
FEN2013134	Unidentified seal	1	0	01/08/13 21:48:00	70.9331	-160.166	100	LO	SW	<120	OT
FEN2013135	Unidentified seal	1	0	01/08/13 22:11:00	70.9452	-159.995	3000	NO	LO	<120	OT
FEN2013136	Gray whale	2	0	01/08/13 22:12:00	70.9458	-159.987	4500	NO	BL	<120	OT
FEN2013137	Unidentified seal	2	0	01/08/13 22:18:00	70.9488	-159.942	2700	NO	LO	<120	OT
FEN2013138	Minke whale	1	0	01/08/13 22:29:00	70.9577	-159.863	350	NO	SW	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013139	Unidentified mysticete whale	1	0	01/08/13 22:58:00	70.9842	-159.651	2000	NO	BL	<120	OT
FEN2013140	Unidentified seal	1	0	01/08/13 23:02:00	70.9878	-159.622	350	NO	SW	<120	OT
FEN2013141	Unidentified seal	1	0	01/08/13 23:04:00	70.9894	-159.607	200	NO	SW	<120	OT
FEN2013142	Ringed seal	1	0	01/08/13 23:08:00	70.9929	-159.578	600	NO	LO	<120	OT
FEN2013143	Ringed seal	1	0	01/08/13 23:44:00	71.0311	-159.327	50	LO	TH	<120	OT
FEN2013144	Unidentified seal	1	0	02/08/13 00:11:00	71.059	-159.148	1000	NO	SW	<120	OT
FEN2013145	Bearded seal	2	0	02/08/13 00:20:00	71.0676	-159.089	467	NO	SW	<120	OT
FEN2013146	Unidentified seal	1	0	02/08/13 00:25:00	71.0721	-159.056	100	NO	SW	<120	OT
FEN2013147	Harbor porpoise	1	0	02/08/13 00:26:00	71.073	-159.049	576	NO	SW	<120	OT
FEN2013148	Unidentified seal	1	0	02/08/13 00:47:00	71.0926	-158.907	100	LO	SW	<120	OT
FEN2013149	Unidentified seal	1	0	02/08/13 00:48:00	71.0935	-158.9	200	NO	DI	<120	OT
FEN2013150	Unidentified seal	2	0	02/08/13 00:56:00	71.0999	-158.843	576	NO	SW	<120	OT
FEN2013151	Unidentified seal	1	0	02/08/13 01:12:00	71.1111	-158.728	150	LO	LO	<120	OT
FEN2013152	Unidentified seal	1	0	02/08/13 01:13:00	71.1116	-158.721	20	LO	SW	<120	OT
FEN2013153	Ringed seal	1	0	02/08/13 01:18:00	71.1139	-158.684	25	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013154	Unidentified seal	1	0	02/08/13 01:29:00	71.1179	-158.598	300	LO	SW	<120	OT
FEN2013155	Minke whale	1	0	02/08/13 01:39:00	71.1181	-158.521	2500	NO	SW	<120	OT
FEN2013156	Ringed seal	1	0	02/08/13 01:42:00	71.1179	-158.498	75	LO	LO	<120	OT
FEN2013157	Unidentified seal	1	0	02/08/13 01:44:00	71.1177	-158.483	467	NO	SW	<120	OT
FEN2013158	Ringed seal	1	0	02/08/13 01:45:00	71.1177	-158.475	20	NO	SW	<120	OT
FEN2013159	Unidentified seal	1	0	02/08/13 01:58:00	71.1161	-158.376	393	NO	SW	<120	OT
FEN2013160	Gray whale	5	1	02/08/13 02:07:00	71.1154	-158.308	50	CD	SW	<120	OT
FEN2013161	Gray whale	2	0	02/08/13 02:16:00	71.1151	-158.25	70	NO	SW	<120	OT
FEN2013162	Gray whale	1	0	02/08/13 02:47:00	71.1159	-158.156	70	CD	SW	<120	OT
FEN2013163	Unidentified seal	1	0	02/08/13 02:58:00	71.1165	-158.124	400	NO	SW	<120	OT
FEN2013164	Bearded seal	1	0	02/08/13 03:18:00	71.1166	-158.1	40	LO	SW	<120	OT
FEN2013165	Gray whale	3	1	02/08/13 03:27:00	71.1166	-158.101	350	NO	LG	<120	OT
FEN2013166	Unidentified mysticete whale	2	0	02/08/13 04:40:00	71.1166	-158.1	3262	NO	FL	<120	DY
FEN2013167	Unidentified mysticete whale	1	0	02/08/13 04:52:00	71.1165	-158.1	2435	NO	BL	<120	DY
FEN2013168	Gray whale	1	0	02/08/13 04:59:00	71.1165	-158.1	75	CD	DI	<120	DY

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013169	Gray whale	9	0	02/08/13 08:17:00	71.1165	-158.101	100	NO	FE	<120	DY
FEN2013170	Pacific walrus	1	1	02/08/13 10:27:00	71.1166	-158.1	2	NO	LG	<120	DY
FEN2013171	Ringed seal	1	0	02/08/13 13:02:00	71.1165	-158.101	400	NO	SW	<120	DY
FEN2013172	Unidentified seal	1	0	02/08/13 13:37:00	71.1183	-158.092	250	LO	LG	<120	DY
FEN2013173	Unidentified seal	4	0	02/08/13 13:59:00	71.1199	-158.086	600	LO	LO	<120	DY
FEN2013174	Unidentified seal	1	0	02/08/13 14:23:00	71.1198	-158.085	653	NO	SW	<120	DY
FEN2013175	Spotted seal	3	0	02/08/13 14:39:00	71.1198	-158.086	150	LO	LO	<120	DY
FEN2013176	Bearded seal	1	0	02/08/13 14:58:00	71.1213	-158.08	300	NO	SW	<120	DY
FEN2013177	Gray whale	1	0	02/08/13 15:58:00	71.1478	-158.053	40	NO	SW	<120	DY
FEN2013178	Unidentified seal	1	0	02/08/13 16:12:00	71.1681	-158.045	150	LO	LO	<120	DY
FEN2013179	Gray whale	7	1	02/08/13 16:38:00	71.1769	-158.052	350	NO	FL	<120	DY
FEN2013180	Unidentified seal	1	0	02/08/13 16:58:00	71.1732	-158.042	100	LO	LO	<120	DY
FEN2013181	Unidentified seal	1	0	02/08/13 18:11:00	71.1537	-158.032	250	SP	TH	<120	OT
FEN2013182	Unidentified seal	1	0	02/08/13 18:15:00	71.1514	-158.029	60	SP	PO	<120	OT
FEN2013183	Unidentified seal	1	0	02/08/13 23:33:00	70.9608	-159.996	40	SP	TH	<120	OT
FEN2013184	Gray whale	1	0	03/08/13 09:40:00	70.9106	-160.427	200	NO	FE	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013185	Unidentified seal	1	0	03/08/13 09:56:00	70.9126	-160.473	70	NO	SW	<120	OT
FEN2013186	Unidentified pinniped	1	0	04/08/13 01:36:00	70.8346	-159.761	50	SP	TH	<120	OT
FEN2013187	Bearded seal	1	0	04/08/13 06:32:00	70.9166	-160.473	50	LO	SW	<120	OT
FEN2013188	Bearded seal	1	0	04/08/13 08:23:00	70.9612	-160.823	30	SP	TH	<120	OT
FEN2013189	Gray whale	1	0	04/08/13 10:02:00	70.9138	-160.669	500	NO	FE	<120	OT
FEN2013190	Gray whale	1	0	04/08/13 10:59:00	70.8851	-160.498	300	NO	FE	<120	OT
NOR2013100	Unidentified seal	1	0	04/08/13 13:38:00	71.2847	-163.136	100	LO	LO	<120	OT
NOR2013101	Bearded seal	1	0	04/08/13 14:19:00	71.2196	-162.94	50	IS	LO	<120	OT
FEN2013191	Bearded seal	1	0	04/08/13 16:40:00	70.7889	-160.377	80	LO	LO	<120	OT
FEN2013192	Unidentified mysticete whale	1	0	04/08/13 18:43:00	70.7465	-160.249	1946	NO	SW	<120	OT
FEN2013193	Gray whale	1	0	04/08/13 20:43:00	70.7646	-160.166	576	NO	SW	<120	OT
FEN2013194	Unidentified pinniped	1	0	04/08/13 21:05:00	70.7474	-160.223	60	SP	TH	<120	OT
FEN2013195	Unidentified seal	1	0	04/08/13 21:21:00	70.7349	-160.265	40	LO	LO	<120	OT
FEN2013196	Gray whale	1	0	04/08/13 21:42:00	70.7184	-160.319	500	NO	BL	<120	OT
FEN2013197	Ringed seal	1	0	05/08/13 01:21:00	70.5588	-160.688	100	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013198	Unidentified mysticete whale	1	0	05/08/13 06:39:00	70.5445	-160.77	2435	NO	BL	<120	OT
FEN2013199	Unidentified seal	1	0	05/08/13 06:57:00	70.557	-160.82	50	NO	RE	<120	OT
FEN2013200	Ringed seal	1	0	05/08/13 12:01:00	70.5904	-160.377	40	SP	SW	<120	OT
FEN2013201	Gray whale	1	0	05/08/13 14:17:00	70.7641	-160.346	200	NO	FE	<120	OT
FEN2013202	Gray whale	1	0	05/08/13 16:34:00	70.8447	-160.761	1800	NO	BL	<120	OT
FEN2013203	Unidentified mysticete whale	2	0	05/08/13 17:06:00	70.8629	-160.861	5015	NO	BL	<120	OT
FEN2013205	Gray whale	1	0	05/08/13 17:17:00	70.8693	-160.895	1623	NO	BL	<120	OT
FEN2013206	Gray whale	6	1	05/08/13 19:20:00	70.94	-161.275	50	CD	FL	<120	OT
FEN2013207	Bearded seal	1	0	05/08/13 20:09:00	70.9681	-161.427	50	LO	TH	<120	OT
NOR2013102	Spotted seal	1	0	05/08/13 23:19:00	71.3091	-163.211	50	LO	LO	120-159	DY
FEN2013208	Bearded seal	1	0	06/08/13 04:54:00	70.7664	-161.544	60	NO	LO	<120	OT
NOR2013103	Bearded seal	1	0	06/08/13 15:19:00	70.9839	-164.051	50	LO	LO	<120	OT
FEN2013209	Humpback whale	1	0	07/08/13 04:07:00	69.5417	-165.997	600	CD	SW	<120	OT
FEN2013210	Unidentified mysticete whale	1	0	07/08/13 05:34:00	69.3027	-166.474	3000	NO	BL	<120	OT
FEN2013211	Unidentified seal	1	0	07/08/13 06:32:00	69.1452	-166.772	70	SP	TH	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013104	Unidentified mysticete whale	2	0	07/08/13 12:39:00	67.9053	-168.484	400	NO	BL	<120	OT
NOR2013105	Gray whale	6	0	07/08/13 12:57:00	67.8616	-168.481	1200	NO	BL	<120	OT
FEN2013212	Gray whale	29	1	07/08/13 13:20:00	67.9342	-168.088	250	NO	FE	<120	OT
NOR2013106	Gray whale	1	0	07/08/13 14:12:00	67.7799	-168.474	702	NO	BL	<120	OT
NOR2013107	Gray whale	8	1	07/08/13 14:24:00	67.7552	-168.474	100	CD	BL	<120	OT
FEN2013213	Gray whale	2	0	07/08/13 15:07:00	67.6576	-168.126	888	NO	SW	<120	OT
NOR2013108	Minke whale	1	0	07/08/13 15:51:00	67.5315	-168.479	892	NO	BL	<120	OT
FEN2013214	Unidentified mysticete whale	1	0	07/08/13 17:10:00	67.2532	-168.191	1946	NO	FS	<120	OT
NOR2013109	Unidentified mysticete whale	1	0	07/08/13 17:59:00	67.2469	-168.477	3273	NO	BL	<120	OT
NOR2013110	Unidentified mysticete whale	1	0	07/08/13 18:04:00	67.2311	-168.478	3956	NO	BL	<120	OT
FEN2013215	Ringed seal	1	0	07/08/13 18:53:00	66.9155	-168.26	300	LO	LO	<120	OT
NOR2013111	Gray whale	3	0	07/08/13 21:40:00	66.5623	-168.504	300	NO	BL	<120	OT
NOR2013112	Gray whale	3	0	07/08/13 21:42:00	66.5564	-168.505	200	CD	BL	<120	OT
NOR2013113	Gray whale	4	0	07/08/13 21:44:00	66.5505	-168.506	1397	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013114	Gray whale	3	0	07/08/13 21:56:00	66.5387	-168.507	600	NO	BL	<120	OT
NOR2013115	Unidentified mysticete whale	1	0	08/08/13 07:03:00	64.923	-168.428	547	NO	BL	<120	OT
FEN2013217	Minke whale	1	0	08/08/13 07:24:00	64.7195	-167.044	400	NO	SW	<120	OT
NOR2013116	Gray whale	1	0	08/08/13 07:48:00	64.7814	-168.416	5031	NO	BL	<120	OT
NOR2013117	Unidentified mysticete whale	1	0	08/08/13 11:47:00	64.0258	-168.351	400	NO	BL	<120	OT
NOR2013118	Unknown	1	0	08/08/13 23:14:00	61.836	-168.382	100	SP	U	<120	OT
NOR2013119	Harbor porpoise	1	0	09/08/13 08:16:00	60.2259	-168.485	150	NO	SW	<120	OT
NOR2013120	Humpback whale	1	0	09/08/13 11:58:00	59.6566	-168.288	1000	NO	BR	<120	OT
FEN2013218	Gray whale	5	0	09/08/13 12:44:00	67.7879	-168.108	400	NO	BL	<120	OT
FEN2013219	Gray whale	10	0	09/08/13 13:12:00	67.8248	-168.101	400	NO	SW	<120	OT
NOR2013121	Harbor porpoise	1	0	09/08/13 13:16:00	59.4204	-168.187	100	IS	SW	<120	OT
FEN2013220	Gray whale	4	1	09/08/13 13:32:00	67.852	-168.097	150	NO	ST	<120	OT
FEN2013221	Gray whale	5	0	09/08/13 13:50:00	67.8792	-168.094	350	NO	LG	<120	OT
FEN2013222	Gray whale	1	0	09/08/13 15:28:00	68.1525	-168.069	150	NO	SW	<120	OT
FEN2013223	Unidentified seal	1	0	09/08/13 15:53:00	68.2312	-168.063	50	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013122	Unidentified mysticete whale	1	0	09/08/13 17:22:00	58.6756	-167.963	2444	NO	BL	<120	OT
NOR2013123	Humpback whale	1	0	09/08/13 17:53:00	58.5828	-167.932	1088	NO	FL	<120	OT
NOR2013124	Humpback whale	1	0	09/08/13 17:58:00	58.5678	-167.927	2000	NO	SW	<120	OT
NOR2013125	Minke whale	1	0	09/08/13 18:42:00	58.4382	-167.882	250	CD	SW	<120	OT
NOR2013126	Northern fur seal	1	0	09/08/13 18:48:00	58.4305	-167.879	50	LO	LO	<120	OT
NOR2013127	Northern fur seal	1	0	09/08/13 19:05:00	58.4014	-167.872	100	LO	FE	<120	OT
NOR2013128	Humpback whale	2	0	09/08/13 20:08:00	58.2095	-167.8	3273	NO	BL	<120	OT
NOR2013129	Northern fur seal	1	0	09/08/13 20:48:00	58.0876	-167.76	200	LO	LO	<120	OT
NOR2013130	Unidentified whale	1	0	09/08/13 20:54:00	58.0692	-167.755	3000	NO	BL	<120	OT
NOR2013131	Unidentified mysticete whale	1	0	09/08/13 21:10:00	58.0199	-167.741	3273	NO	BL	<120	OT
NOR2013132	Unidentified mysticete whale	2	0	09/08/13 21:13:00	58.0109	-167.738	5031	NO	BL	<120	OT
NOR2013133	Northern fur seal	1	0	09/08/13 21:14:00	58.0079	-167.737	50	LO	LO	<120	OT
NOR2013134	Unidentified mysticete whale	1	0	09/08/13 21:17:00	57.9991	-167.734	1954	NO	BL	<120	OT
NOR2013135	Humpback whale	2	0	09/08/13 21:19:00	57.9932	-167.732	2444	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013136	Unidentified mysticete whale	2	0	09/08/13 21:33:00	57.952	-167.72	5031	NO	BL	<120	OT
NOR2013137	Unidentified mysticete whale	2	0	09/08/13 22:03:00	57.8632	-167.69	3956	NO	BL	<120	OT
NOR2013138	Unidentified mysticete whale	1	0	09/08/13 22:17:00	57.8216	-167.677	1954	NO	BL	<120	OT
NOR2013139	Unidentified mysticete whale	1	0	10/08/13 08:28:00	55.9764	-167.1	3273	NO	BL	<120	OT
NOR2013140	Dall's porpoise	7	0	10/08/13 14:23:00	54.848	-166.749	100	NO	SW	<120	OT
NOR2013141	Dall's porpoise	15	0	10/08/13 14:32:00	54.8175	-166.741	50	NO	SW	<120	OT
NOR2013142	Northern fur seal	1	0	10/08/13 14:37:00	54.8007	-166.737	50	IS	RE	<120	OT
NOR2013143	Minke whale	1	0	10/08/13 14:47:00	54.7674	-166.728	755	NO	SW	<120	OT
NOR2013144	Fin whale	1	0	10/08/13 16:02:00	54.5225	-166.661	1800	NO	BL	<120	OT
NOR2013145	Humpback whale	1	0	10/08/13 17:05:00	54.3248	-166.602	755	NO	SW	<120	OT
NOR2013146	Northern fur seal	1	0	10/08/13 17:20:00	54.2782	-166.587	200	NO	RE	<120	OT
NOR2013147	Dall's porpoise	4	0	10/08/13 17:52:00	54.1804	-166.552	50	NO	SW	<120	OT
NOR2013148	Dall's porpoise	1	0	10/08/13 18:07:00	54.1342	-166.536	100	NO	SW	<120	OT
NOR2013149	Humpback whale	1	0	10/08/13 18:13:00	54.1163	-166.531	500	NO	SW	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013150	Humpback whale	1	0	10/08/13 18:35:00	54.0531	-166.515	5000	NO	BL	<120	OT
NOR2013151	Humpback whale	3	0	10/08/13 18:37:00	54.0477	-166.514	3000	NO	BL	<120	OT
NOR2013152	Humpback whale	1	0	10/08/13 18:41:00	54.0368	-166.512	2000	NO	BL	<120	OT
NOR2013153	Humpback whale	1	0	10/08/13 18:44:00	54.0286	-166.51	1500	NO	BL	<120	OT
NOR2013154	Humpback whale	2	1	10/08/13 18:53:00	54.004	-166.504	1000	NO	BL	<120	OT
FEN2013224	Ringed seal	1	0	11/08/13 22:20:00	71.126	-166.734	50	SP	TH	≥160	SH
FEN2013225	Pacific walrus	1	0	12/08/13 05:15:00	71.1352	-166.773	400	LO	LO	120-159	SH
FEN2013226	Ringed seal	1	0	12/08/13 20:46:00	71.1863	-166.847	100	IS	SW	≥160	RU
FEN2013227	Pacific walrus	1	0	13/08/13 07:59:00	71.1482	-166.886	50	SP	TH	<120	OT
FEN2013228	Unidentified seal	1	0	13/08/13 08:51:00	71.2013	-166.939	350	LO	SW	<120	OT
FEN2013229	Unidentified seal	1	0	13/08/13 09:45:00	71.1516	-166.859	200	IS	SW	<120	RC
FEN2013230	Unidentified mysticete whale	1	0	13/08/13 10:02:00	71.1341	-166.838	75	NO	SW	<120	RC
FEN2013231	Unidentified seal	1	0	13/08/13 10:06:00	71.13	-166.833	250	NO	SW	<120	RC
FEN2013232	Unidentified seal	1	0	13/08/13 11:12:00	71.1261	-166.865	100	LO	OT	<120	RC
FEN2013233	Unidentified seal	1	0	13/08/13 11:32:00	71.1467	-166.89	150	NO	SW	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013234	Ringed seal	1	0	13/08/13 11:58:00	71.1736	-166.923	50	CD	SW	<120	OT
FEN2013235	Pacific walrus	2	0	13/08/13 13:42:00	71.1193	-166.838	200	SP	LO	<120	OT
FEN2013236	Ringed seal	1	0	13/08/13 16:22:00	71.1948	-166.943	40	LO	TH	<120	OT
FEN2013237	Unidentified seal	1	0	13/08/13 16:30:00	71.1862	-166.934	50	LO	LO	<120	OT
FEN2013238	Unidentified seal	1	1	13/08/13 16:41:00	71.1747	-166.92	60	LO	LO	<120	OT
FEN2013239	Unidentified seal	1	0	13/08/13 17:07:00	71.1477	-166.887	50	LO	PO	<120	OT
FEN2013240	Pacific walrus	1	0	13/08/13 17:34:00	71.1199	-166.854	300	NO	SW	<120	OT
FEN2013241	Ringed seal	1	0	13/08/13 18:43:00	71.1511	-166.821	175	LO	OT	<120	OT
FEN2013242	Ringed seal	1	1	13/08/13 19:23:00	71.1897	-166.824	300	LO	LO	<120	RC
FEN2013243	Ringed seal	1	1	13/08/13 19:46:00	71.1947	-166.825	200	LO	LO	<120	DY
FEN2013244	Unidentified seal	1	0	13/08/13 22:07:00	71.102	-166.081	25	SP	TH	<120	OT
FEN2013245	Ringed seal	1	0	13/08/13 22:47:00	71.0602	-165.779	40	LO	LO	<120	OT
FEN2013246	Ringed seal	1	0	13/08/13 22:58:00	71.0489	-165.695	100	IS	TH	<120	OT
FEN2013247	Unidentified seal	1	1	13/08/13 23:46:00	71.0004	-165.325	75	SP	TH	<120	OT
FEN2013248	Unidentified seal	1	0	14/08/13 00:15:00	70.9704	-165.105	100	LO	SW	<120	OT
FEN2013249	Unidentified seal	1	0	14/08/13 16:40:00	70.9313	-163.821	100	SP	TH	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013250	Unidentified seal	1	0	14/08/13 18:16:00	71.0478	-164.577	275	LO	LO	<120	OT
FEN2013251	Unidentified seal	1	0	14/08/13 18:27:00	71.0599	-164.665	50	IS	SW	<120	OT
FEN2013252	Unidentified pinniped	2	0	14/08/13 18:54:00	71.0893	-164.882	200	SP	TH	<120	OT
FEN2013253	Bearded seal	1	0	14/08/13 19:07:00	71.1041	-164.987	50	NO	LO	<120	OT
FEN2013254	Unidentified seal	1	0	14/08/13 22:49:00	71.5361	-165.816	150	SP	TH	<120	OT
FEN2013255	Unidentified seal	1	0	15/08/13 00:30:00	71.5561	-165.837	100	NO	TH	<120	DY
FEN2013256	Unidentified seal	1	0	15/08/13 21:29:00	71.5737	-166.022	55	LO	TH	≥160	SH
NOR2013155	Harbor porpoise	1	0	15/08/13 22:34:00	53.9331	-166.485	300	NO	SW	<120	OT
NOR2013156	Unidentified seal	1	0	16/08/13 07:48:00	55.7298	-167.025	450	LO	SW	<120	OT
NOR2013157	Dall's porpoise	3	0	16/08/13 08:35:00	55.8881	-167.07	300	NO	ST	<120	OT
NOR2013158	Northern fur seal	1	0	16/08/13 09:07:00	55.9964	-167.103	100	LO	RE	<120	OT
NOR2013159	Northern fur seal	1	0	16/08/13 09:16:00	56.0269	-167.113	100	LO	RE	<120	OT
NOR2013160	Northern fur seal	1	0	16/08/13 09:36:00	56.0943	-167.136	200	LO	SW	<120	OT
NOR2013161	Northern fur seal	1	0	16/08/13 09:41:00	56.1113	-167.142	1629	NO	RE	<120	OT
NOR2013162	Minke whale	1	0	16/08/13 09:45:00	56.1248	-167.146	500	NO	SW	<120	OT
NOR2013163	Northern fur seal	2	0	16/08/13 09:52:00	56.1485	-167.154	100	LO	RE	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013164	Northern fur seal	1	0	16/08/13 10:20:00	56.244	-167.183	300	NO	RE	<120	OT
NOR2013165	Northern fur seal	1	0	16/08/13 10:35:00	56.2953	-167.199	200	LO	RE	<120	OT
NOR2013166	Unidentified seal	1	0	16/08/13 10:42:00	56.3193	-167.207	70	LO	SW	<120	OT
NOR2013167	Killer whale	2	0	16/08/13 16:04:00	57.4134	-167.536	250	CD	SW	<120	OT
NOR2013168	Northern fur seal	1	0	16/08/13 21:26:00	58.3454	-167.857	100	LO	LO	<120	OT
FEN2013257	Pacific walrus	1	0	17/08/13 06:43:00	71.5806	-165.783	200	NO	SW	≥160	SH
FEN2013258	Unidentified seal	1	0	17/08/13 07:42:00	71.5231	-165.869	250	NO	SW	≥160	RU
FEN2013259	Pacific walrus	1	0	17/08/13 14:34:00	71.5336	-165.964	1084	NO	SW	≥160	RU
NOR2013169	Gray whale	1	1	17/08/13 16:27:00	61.9502	-168.383	100	NO	DE	<120	OT
FEN2013260	Ringed seal	1	0	17/08/13 16:49:00	71.5308	-165.914	20	LO	LO	≥160	SH
NOR2013170	Unidentified mysticete whale	1	0	17/08/13 18:20:00	62.3227	-168.346	1954	NO	BL	<120	OT
FEN2013261	Unidentified seal	1	0	17/08/13 18:57:00	71.535	-165.836	300	NO	SW	≥160	LS
FEN2013262	Unidentified seal	1	0	17/08/13 19:20:00	71.5221	-165.826	250	LO	LO	≥160	RU
FEN2013263	Pacific walrus	1	0	17/08/13 19:46:00	71.5487	-165.791	250	CD	LO	≥160	SH
NOR2013171	Unidentified whale	1	0	18/08/13 06:45:00	64.9041	-168.418	200	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013172	Gray whale	1	0	18/08/13 07:12:00	64.9699	-168.42	250	CD	BL	<120	OT
NOR2013173	Gray whale	1	0	18/08/13 07:35:00	65.0133	-168.423	300	NO	BL	<120	OT
FEN2013264	Unidentified seal	1	0	18/08/13 16:52:00	71.4127	-166.077	50	SP	DI	<120	OT
NOR2013174	Gray whale	6	0	18/08/13 20:28:00	67.7084	-168.481	1397	NO	BL	<120	OT
NOR2013175	Gray whale	5	0	18/08/13 20:32:00	67.722	-168.481	3273	NO	BL	<120	OT
NOR2013176	Gray whale	20	4	18/08/13 20:37:00	67.7391	-168.479	250	CD	BL	<120	OT
NOR2013177	Fin whale	3	1	18/08/13 20:41:00	67.7526	-168.478	350	CD	BL	<120	OT
NOR2013178	Gray whale	4	1	18/08/13 20:55:00	67.7756	-168.476	350	NO	FE	<120	OT
NOR2013179	Unidentified mysticete whale	1	0	18/08/13 21:11:00	67.7987	-168.476	1088	NO	BL	<120	OT
NOR2013180	Unidentified mysticete whale	1	0	18/08/13 21:33:00	67.8466	-168.469	1088	NO	BL	<120	OT
NOR2013181	Gray whale	2	0	18/08/13 21:36:00	67.8566	-168.468	702	NO	BL	<120	OT
NOR2013182	Gray whale	3	0	18/08/13 21:50:00	67.9031	-168.463	200	NO	BL	<120	OT
NOR2013183	Unidentified mysticete whale	2	0	18/08/13 22:03:00	67.9454	-168.459	5031	NO	BL	<120	OT
NOR2013184	Unidentified mysticete whale	2	0	18/08/13 22:03:00	67.9454	-168.459	5031	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013185	Gray whale	4	0	18/08/13 22:15:00	67.9739	-168.46	755	NO	BL	<120	OT
NOR2013187	Gray whale	2	0	18/08/13 22:16:00	67.9752	-168.46	579	NO	FE	<120	OT
NOR2013186	Gray whale	1	0	18/08/13 22:35:00	68.0026	-168.468	1397	NO	BL	<120	OT
FEN2013265	Unidentified seal	1	0	18/08/13 22:43:00	70.3659	-166.765	40	SP	PO	<120	OT
NOR2013188	Humpback whale	1	0	19/08/13 09:15:00	69.4756	-167.755	629	NO	BR	<120	OT
FEN2013266	Gray whale	2	1	19/08/13 13:15:00	67.7641	-168.135	400	NO	FE	<120	OT
FEN2013267	Minke whale	1	0	19/08/13 15:12:00	67.394	-168.185	150	NO	SW	<120	OT
FEN2013268	Minke whale	1	0	20/08/13 12:35:00	63.6792	-167.542	300	NO	SW	<120	OT
FEN2013269	Unidentified porpoise	4	0	20/08/13 12:55:00	63.6185	-167.502	400	NO	SA	<120	OT
FEN2013270	Minke whale	10	0	20/08/13 13:01:00	63.6002	-167.49	50	NO	SW	<120	OT
FEN2013271	Spotted seal	1	0	20/08/13 13:35:00	63.5404	-167.473	40	LO	LO	<120	OT
FEN2013272	Minke whale	4	0	20/08/13 13:52:00	63.4945	-167.47	350	NO	SW	<120	OT
FEN2013273	Humpback whale	1	0	20/08/13 13:55:00	63.4853	-167.47	500	IS	BR	<120	OT
FEN2013274	Harbor porpoise	1	0	20/08/13 14:04:00	63.4575	-167.47	516	CD	PO	<120	OT
FEN2013275	Harbor porpoise	1	0	20/08/13 14:33:00	63.3695	-167.471	300	NO	PO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013276	Unidentified mysticete whale	1	0	20/08/13 15:32:00	63.1937	-167.472	400	NO	BL	<120	OT
FEN2013277	Minke whale	1	0	20/08/13 15:57:00	63.12	-167.475	80	CD	SW	<120	OT
FEN2013278	Unidentified mysticete whale	1	0	20/08/13 18:14:00	62.7391	-167.496	300	NO	SW	<120	OT
FEN2013279	Harbor porpoise	1	0	20/08/13 18:23:00	62.7162	-167.494	400	NO	SW	<120	OT
FEN2013280	Unidentified mysticete whale	1	0	20/08/13 19:08:00	62.5846	-167.475	250	NO	SW	<120	OT
FEN2013281	Unidentified mysticete whale	1	0	20/08/13 19:11:00	62.5758	-167.473	400	NO	SW	<120	OT
NOR2013189	Pacific walrus	1	0	21/08/13 09:01:00	71.021	-163.716	1954	LO	RE	<120	OT
NOR2013190	Polar bear	3	2	21/08/13 10:10:00	71.0767	-163.429	2951	NO	WK	<120	OT
FEN2013282	Northern fur seal	1	0	21/08/13 18:25:00	58.6097	-168.36	50	LO	LO	<120	OT
FEN2013283	Northern fur seal	1	0	21/08/13 21:48:00	58.0772	-168.316	30	NO	SW	<120	OT
FEN2013284	Northern fur seal	1	0	21/08/13 22:01:00	58.0413	-168.314	30	IS	PO	<120	OT
FEN2013285	Unidentified seal	1	0	22/08/13 21:04:00	54.7848	-167.172	40	NO	LO	<120	OT
NOR2013191	Pacific walrus	1	0	23/08/13 09:37:00	71.1583	-163.111	5000	NO	RE	<120	ID
FEN2013286	Northern fur seal	2	0	24/08/13 08:10:00	54.8576	-167.679	100	NO	LG	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013287	Northern fur seal	1	0	24/08/13 08:32:00	54.8952	-167.777	50	NO	LO	<120	OT
NOR2013192	Unidentified seal	1	0	24/08/13 08:41:00	71.1292	-162.819	200	NO	LO	<120	ID
FEN2013288	Dall's porpoise	3	0	24/08/13 08:56:00	54.9356	-167.885	100	IS	SA	<120	OT
FEN2013289	Northern fur seal	1	0	24/08/13 09:19:00	55.0026	-167.918	100	LO	LO	<120	OT
FEN2013290	Fin whale	1	0	24/08/13 09:45:00	55.0852	-167.941	300	CD	SW	<120	OT
NOR2013193	Unidentified seal	1	0	24/08/13 10:52:00	71.128	-162.799	800	LO	SW	<120	ID
FEN2013291	Dall's porpoise	2	0	24/08/13 11:16:00	55.3775	-168.014	200	SP	PO	<120	OT
NOR2013194	Polar bear	1	0	24/08/13 12:41:00	71.1052	-162.791	9000	NO	WK	<120	OT
FEN2013292	Northern fur seal	1	0	24/08/13 14:53:00	56.0526	-168.143	400	IS	LO	<120	OT
FEN2013293	Northern fur seal	1	0	24/08/13 15:29:00	56.1688	-168.159	100	NO	DI	<120	OT
NOR2013196	Spotted seal	1	0	24/08/13 15:40:00	70.946	-162.405	150	LO	LO	<120	OT
FEN2013294	Northern fur seal	1	0	24/08/13 15:51:00	56.2413	-168.169	75	LO	LO	<120	OT
NOR2013197	Unidentified seal	1	0	24/08/13 16:02:00	70.9111	-162.339	200	NO	OT	<120	OT
FEN2013295	Northern fur seal	1	0	24/08/13 16:16:00	56.3236	-168.182	100	CD	LG	<120	OT
FEN2013296	Northern fur seal	1	0	24/08/13 18:25:00	56.7425	-168.258	150	LO	LO	<120	OT
FEN2013297	Northern fur seal	1	0	24/08/13 18:52:00	56.8325	-168.265	275	CD	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013298	Dall's porpoise	5	0	24/08/13 19:35:00	56.9771	-168.276	200	NO	SA	<120	OT
FEN2013299	Northern fur seal	1	0	24/08/13 22:28:00	57.4904	-168.289	200	NO	PO	<120	OT
NOR2013198	Pacific walrus	6	0	25/08/13 21:58:00	71.2969	-163.239	9044	NO	RE	<120	OT
FEN2013300	Unidentified mysticete whale	1	0	26/08/13 15:50:00	64.8661	-168.181	3000	NO	BL	<120	OT
FEN2013301	Gray whale	1	0	26/08/13 15:53:00	64.8712	-168.2	500	NO	FL	<120	OT
FEN2013302	Gray whale	2	0	26/08/13 15:56:00	64.8763	-168.218	750	NO	BL	<120	OT
FEN2013303	Unidentified mysticete whale	1	0	26/08/13 15:58:00	64.8797	-168.23	4000	NO	BL	<120	OT
FEN2013304	Unidentified mysticete whale	1	0	26/08/13 16:07:00	64.8949	-168.285	1500	NO	BL	<120	OT
FEN2013305	Gray whale	9	0	26/08/13 16:09:00	64.8982	-168.297	100	NO	BL	<120	OT
FEN2013306	Gray whale	2	0	26/08/13 16:13:00	64.905	-168.321	1000	NO	BL	<120	OT
FEN2013307	Gray whale	7	0	26/08/13 16:42:00	64.9419	-168.428	1392	NO	FL	<120	OT
FEN2013308	Gray whale	7	0	26/08/13 16:53:00	64.9722	-168.432	500	NO	FE	<120	OT
FEN2013309	Gray whale	1	0	26/08/13 17:15:00	65.0401	-168.436	500	NO	BL	<120	OT
FEN2013310	Unidentified seal	1	0	26/08/13 22:38:00	66.0579	-168.42	50	LO	LO	<120	OT
FEN2013311	Gray whale	2	0	27/08/13 08:30:00	67.8385	-168.15	150	NO	TR	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013312	Gray whale	6	0	27/08/13 08:59:00	67.9296	-168.14	1000	NO	TR	<120	OT
FEN2013313	Unidentified seal	1	0	27/08/13 13:40:00	68.7812	-167.555	125	NO	LO	<120	OT
FEN2013314	Spotted seal	1	0	27/08/13 15:36:00	69.0687	-167.018	300	NO	LO	<120	OT
FEN2013315	Minke whale	1	0	27/08/13 16:16:00	69.1673	-166.834	450	NO	SW	<120	OT
FEN2013316	Minke whale	1	0	27/08/13 19:56:00	69.6987	-165.759	500	NO	SW	<120	OT
NOR2013199	Polar bear	1	0	27/08/13 21:29:00	71.3088	-163.211	350	LO	SW	120-159	DY
FEN2013317	Unidentified seal	1	0	27/08/13 22:48:00	70.1289	-164.896	50	IS	TH	<120	OT
FEN2013318	Unidentified seal	1	0	27/08/13 23:22:00	70.2137	-164.728	175	LO	LO	<120	OT
FEN2013319	Ringed seal	1	0	28/08/13 13:22:00	70.8532	-160.156	40	LO	LO	<120	DY
FEN2013320	Bearded seal	1	0	28/08/13 14:22:00	70.8484	-160.051	75	LO	LO	<120	OT
NOR2013200	Unidentified seal	1	0	28/08/13 15:37:00	71.3089	-163.211	100	LO	LO	120-159	DY
FEN2013321	Ringed seal	1	0	28/08/13 15:43:00	70.8283	-159.791	30	SP	LO	<120	OT
FEN2013322	Ringed seal	1	0	28/08/13 15:56:00	70.8347	-159.752	30	NO	DI	<120	OT
FEN2013323	Unidentified seal	1	0	28/08/13 16:14:00	70.8382	-159.77	20	NO	LO	<120	OT
FEN2013324	Unidentified seal	2	0	28/08/13 16:52:00	70.8296	-159.779	25	NO	SW	<120	OT
FEN2013325	Bearded seal	1	0	28/08/13 18:18:00	70.8377	-159.764	80	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013201	Bearded seal	2	0	28/08/13 19:10:00	71.3089	-163.211	100	LO	MI	120-159	DY
FEN2013326	Ringed seal	1	0	28/08/13 19:17:00	70.839	-159.845	40	LO	LO	<120	OT
FEN2013327	Ringed seal	1	0	28/08/13 20:23:00	70.8357	-159.813	30	NO	LG	<120	OT
FEN2013328	Unidentified seal	1	0	29/08/13 07:20:00	70.9974	-161.114	75	NO	SW	<120	OT
NOR2013202	Unidentified seal	1	0	29/08/13 07:43:00	71.3071	-163.173	100	LO	LO	120-159	DY
FEN2013329	Gray whale	1	0	29/08/13 08:15:00	71.0189	-161.29	1623	NO	BL	<120	OT
NOR2013203	Unidentified seal	1	0	29/08/13 13:22:00	71.2318	-163.126	140	LO	LO	<120	DY
FEN2013330	Unidentified seal	1	0	29/08/13 15:45:00	71.1852	-162.702	300	NO	LG	<120	OT
FEN2013331	Unidentified seal	1	0	29/08/13 15:56:00	71.1888	-162.734	150	NO	DI	<120	OT
FEN2013332	Unidentified seal	1	0	29/08/13 16:37:00	71.2018	-162.855	490	NO	SW	<120	OT
NOR2013204	Bearded seal	1	0	29/08/13 17:04:00	71.2046	-163.095	300	LO	TH	<120	DY
FEN2013333	Unidentified seal	1	0	29/08/13 17:06:00	71.2113	-162.935	30	NO	SW	<120	OT
FEN2013334	Unidentified seal	1	0	29/08/13 20:11:00	71.1999	-163.117	25	NO	LO	<120	DY
FEN2013335	Unidentified mysticete whale	1	0	29/08/13 23:17:00	71.2071	-162.998	4500	NO	BL	<120	OT
FEN2013336	Gray whale	3	0	30/08/13 09:00:00	71.0306	-161.342	1219	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013338	Unidentified seal	1	0	30/08/13 12:42:00	71.0116	-161.388	250	NO	LG	<120	OT
FEN2013339	Bearded seal	1	0	30/08/13 12:55:00	71.0051	-161.422	100	NO	LO	<120	OT
FEN2013340	Bearded seal	1	0	30/08/13 13:12:00	70.9967	-161.467	50	NO	LO	<120	OT
FEN2013341	Unidentified seal	1	0	30/08/13 13:17:00	70.9941	-161.48	100	LO	TH	<120	OT
FEN2013342	Unidentified seal	1	0	30/08/13 13:30:00	70.9876	-161.515	75	NO	SW	<120	OT
FEN2013343	Unidentified seal	1	0	30/08/13 13:40:00	70.9826	-161.541	125	NO	LO	<120	OT
FEN2013344	Bearded seal	1	0	30/08/13 13:48:00	70.9786	-161.563	100	NO	SW	<120	OT
FEN2013345	Ringed seal	1	0	30/08/13 13:50:00	70.9776	-161.568	50	LO	LO	<120	OT
FEN2013346	Unidentified seal	1	0	30/08/13 14:02:00	70.9715	-161.6	400	LO	LO	<120	OT
FEN2013347	Unidentified seal	1	0	30/08/13 14:15:00	70.9643	-161.579	450	NO	SW	<120	OT
FEN2013348	Spotted seal	1	0	30/08/13 14:18:00	70.9626	-161.568	75	SP	LO	<120	OT
FEN2013349	Ringed seal	1	0	30/08/13 14:42:00	70.9501	-161.492	400	LO	RE	<120	OT
FEN2013350	Unidentified seal	3	0	30/08/13 14:59:00	70.9525	-161.451	752	NO	RE	<120	OT
FEN2013351	Unidentified seal	1	0	30/08/13 15:01:00	70.9547	-161.451	1084	NO	RE	<120	OT
FEN2013352	Unidentified seal	1	0	30/08/13 15:10:00	70.9654	-161.454	1392	NO	RE	<120	OT
FEN2013353	Spotted seal	1	0	30/08/13 15:15:00	70.9709	-161.457	339	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013354	Bearded seal	1	0	30/08/13 15:15:00	70.9709	-161.457	450	LO	LO	<120	OT
FEN2013355	Unidentified mysticete whale	2	0	30/08/13 16:23:00	71.0058	-161.635	150	NO	OT	<120	OT
NOR2013205	Unidentified seal	1	0	30/08/13 18:14:00	71.3091	-163.212	200	NO	LG	120-159	DY
FEN2013357	Bearded seal	1	0	31/08/13 12:35:00	71.1334	-163.287	50	NO	DI	<120	OT
FEN2013358	Bearded seal	1	0	31/08/13 13:44:00	71.0946	-163.112	50	SP	TH	<120	OT
FEN2013359	Bearded seal	1	0	31/08/13 14:33:00	71.0667	-162.987	150	LO	LO	<120	OT
FEN2013360	Bearded seal	1	0	31/08/13 18:38:00	70.9269	-162.37	175	SP	TH	<120	OT
FEN2013361	Bearded seal	1	0	31/08/13 18:47:00	70.9218	-162.347	427	NO	SW	<120	OT
FEN2013362	Unidentified seal	1	0	31/08/13 18:59:00	70.9149	-162.318	250	SP	TH	<120	OT
FEN2013363	Unidentified seal	1	0	31/08/13 20:09:00	70.8746	-162.144	200	LO	RE	<120	OT
NOR2013206	Unidentified seal	1	0	31/08/13 20:16:00	71.3081	-163.211	500	NO	SW	120-159	DY
NOR2013207	Unidentified seal	1	0	31/08/13 21:49:00	71.3081	-163.211	600	LO	LO	120-159	DY
FEN2013364	Unidentified seal	1	0	31/08/13 22:10:00	70.8564	-162.065	250	LO	LO	<120	OT
FEN2013365	Unidentified seal	1	0	31/08/13 22:52:00	70.832	-161.961	75	CD	RE	<120	OT
FEN2013366	Bearded seal	1	0	01/09/13 07:53:00	70.9914	-161.143	50	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013367	Bearded seal	1	0	01/09/13 09:01:00	70.961	-160.958	25	LO	RE	<120	OT
FEN2013368	Bearded seal	1	0	01/09/13 09:10:00	70.957	-160.933	400	LO	SW	<120	OT
FEN2013369	Unidentified seal	1	0	01/09/13 09:15:00	70.9548	-160.919	815	NO	SW	<120	OT
FEN2013370	Unidentified seal	1	0	01/09/13 09:17:00	70.9539	-160.914	1000	NO	SW	<120	OT
FEN2013371	Unidentified seal	1	0	01/09/13 09:27:00	70.9495	-160.887	1623	NO	DI	<120	OT
FEN2013372	Gray whale	1	0	01/09/13 09:31:00	70.9476	-160.876	200	NO	SW	<120	OT
FEN2013373	Unidentified seal	1	0	01/09/13 09:33:00	70.9467	-160.871	200	NO	SW	<120	OT
FEN2013374	Bearded seal	1	0	01/09/13 09:39:00	70.944	-160.854	800	NO	SW	<120	OT
FEN2013375	Bearded seal	1	0	01/09/13 09:43:00	70.9423	-160.843	600	LO	SW	<120	OT
FEN2013376	Gray whale	4	0	01/09/13 09:57:00	70.9361	-160.805	752	NO	BL	<120	OT
FEN2013377	Unidentified seal	1	0	01/09/13 09:59:00	70.9352	-160.799	125	NO	LO	<120	OT
FEN2013378	Unidentified seal	1	0	01/09/13 10:43:00	70.9024	-160.772	752	NO	LO	<120	OT
FEN2013379	Bearded seal	1	0	01/09/13 11:01:00	70.8911	-160.832	300	NO	DI	<120	OT
FEN2013380	Bearded seal	1	0	01/09/13 11:04:00	70.8904	-160.844	75	LO	DI	<120	OT
FEN2013381	Bearded seal	1	0	01/09/13 11:19:00	70.8866	-160.905	75	LO	DI	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013382	Unidentified mysticete whale	1	0	01/09/13 12:03:00	70.8749	-161.083	2000	NO	SW	<120	OT
FEN2013383	Minke whale	1	0	01/09/13 14:00:00	70.8501	-161.558	550	NO	SW	<120	OT
FEN2013384	Unidentified seal	1	0	01/09/13 14:38:00	70.8783	-161.686	100	SP	TH	<120	OT
FEN2013385	Bearded seal	1	0	01/09/13 15:03:00	70.8972	-161.774	50	SP	DI	<120	OT
FEN2013386	Unidentified seal	1	0	01/09/13 18:36:00	71.0156	-162.315	60	SP	TH	<120	OT
NOR2013208	Unidentified pinniped	2	0	02/09/13 10:28:00	71.3091	-163.211	9044	NO	RE	<120	DY
NOR2013209	Unidentified mysticete whale	1	0	04/09/13 09:45:00	71.2324	-157.368	3000	NO	BL	<120	ID
NOR2013211	Unidentified seal	1	0	04/09/13 12:16:00	71.2322	-157.4	1000	NO	LO	<120	ID
NOR2013212	Unidentified seal	1	0	04/09/13 14:49:00	71.2307	-157.399	200	LO	LO	<120	ID
NOR2013213	Gray whale	1	0	04/09/13 15:05:00	71.2283	-157.408	600	NO	BL	<120	ID
NOR2013214	Gray whale	1	0	04/09/13 17:53:00	71.2411	-157.417	1397	NO	BL	<120	ID
NOR2013215	Unidentified seal	1	0	05/09/13 14:37:00	71.3086	-163.215	400	NO	SW	120-159	DY
NOR2013216	Bearded seal	1	0	06/09/13 19:48:00	71.309	-163.212	200	LO	LO	120-159	DY
NOR2013217	Bearded seal	1	0	07/09/13 13:01:00	71.3089	-163.211	200	LO	LO	120-159	DY
NOR2013218	Bearded seal	1	0	07/09/13 19:49:00	71.309	-163.211	200	NO	DI	120-159	DY

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013219	Bearded seal	1	0	07/09/13 22:18:00	71.309	-163.211	100	LO	LO	120-159	DY
NOR2013220	Spotted seal	1	0	08/09/13 07:08:00	71.309	-163.211	75	NO	LG	120-159	DY
FEN2013387	Unidentified seal	1	0	08/09/13 08:38:00	71.1712	-166.41	400	NO	DI	<120	DP
NOR2013221	Spotted seal	1	0	08/09/13 09:33:00	71.309	-163.211	250	LO	SW	120-159	DY
NOR2013222	Bearded seal	1	0	08/09/13 12:42:00	71.309	-163.211	200	LO	SW	120-159	DY
FEN2013388	Unidentified seal	1	0	09/09/13 19:57:00	71.1486	-166.392	516	LO	RE	≥160	LS
FEN2013389	Unidentified pinniped	1	0	09/09/13 22:47:00	71.145	-166.461	100	NO	DI	≥160	LS
NOR2013223	Spotted seal	1	0	10/09/13 09:04:00	71.3033	-163.187	30	LO	SW	120-159	DY
NOR2013224	Unidentified seal	1	0	10/09/13 10:07:00	71.3001	-163.201	50	LO	LO	120-159	DY
NOR2013225	Bearded seal	1	0	10/09/13 11:50:00	71.2997	-163.206	500	LO	SW	120-159	DY
NOR2013226	Spotted seal	1	0	10/09/13 17:53:00	71.3041	-163.234	300	LO	SW	120-159	DY
NOR2013227	Unidentified seal	1	0	11/09/13 05:30:00	71.3089	-163.212	25	LO	SW	120-159	DY
NOR2013228	Unidentified seal	1	0	11/09/13 08:15:00	71.309	-163.211	20	NO	SW	120-159	DY
NOR2013229	Spotted seal	1	0	11/09/13 08:29:00	71.3089	-163.212	125	LO	LO	120-159	DY
NOR2013230	Spotted seal	1	0	11/09/13 08:42:00	71.3089	-163.212	100	NO	SW	120-159	DY
NOR2013231	Unidentified seal	1	0	11/09/13 09:41:00	71.309	-163.212	150	NO	DI	120-159	DY

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013232	Bearded seal	1	0	11/09/13 10:19:00	71.309	-163.211	250	NO	SW	120-159	DY
NOR2013233	Spotted seal	1	0	11/09/13 10:34:00	71.309	-163.212	100	LO	SW	120-159	DY
NOR2013234	Bearded seal	1	0	11/09/13 12:40:00	71.3039	-163.189	200	LO	RE	120-159	DY
FEN2013390	Unidentified seal	1	0	11/09/13 16:22:00	71.1992	-166.364	45	LO	LO	≥160	SH
FEN2013391	Unidentified seal	1	0	11/09/13 17:46:00	71.1659	-166.261	50	CD	DI	≥160	LS
NOR2013236	Unidentified mysticete whale	1	0	12/09/13 12:51:00	67.9384	-168.491	800	NO	BL	<120	OT
NOR2013237	Gray whale	2	0	12/09/13 13:00:00	67.9231	-168.486	579	NO	SW	<120	OT
NOR2013238	Gray whale	2	0	12/09/13 13:05:00	67.9163	-168.483	700	NO	BL	<120	OT
NOR2013239	Gray whale	2	0	12/09/13 13:10:00	67.9072	-168.479	655	NO	BL	<120	OT
FEN2013392	Unidentified seal	1	0	12/09/13 13:24:00	71.1913	-166.186	100	LO	LO	<120	OT
FEN2013393	Ringed seal	1	0	12/09/13 13:39:00	71.1834	-166.239	75	LO	DI	<120	OT
FEN2013394	Unidentified seal	1	0	12/09/13 13:54:00	71.1728	-166.249	350	NO	SW	<120	OT
FEN2013395	Ringed seal	1	0	12/09/13 14:50:00	71.1846	-166.18	50	CD	TH	<120	RC
FEN2013396	Ringed seal	1	0	12/09/13 15:42:00	71.1888	-166.17	20	SP	TH	<120	OT
FEN2013397	Unidentified seal	1	0	12/09/13 16:27:00	71.1644	-166.327	75	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013398	Unidentified seal	1	0	14/09/13 11:00:00	71.2115	-158.539	50	NO	SW	<120	DY
NOR2013241	Northern fur seal	2	0	14/09/13 11:45:00	58.5909	-167.943	250	NO	RE	<120	OT
NOR2013242	Humpback whale	1	0	14/09/13 12:19:00	58.481	-167.905	500	NO	BR	<120	OT
NOR2013243	Northern fur seal	1	0	14/09/13 15:17:00	57.9401	-167.711	200	LO	RE	<120	OT
NOR2013244	Northern fur seal	1	0	14/09/13 15:23:00	57.9201	-167.704	250	LO	RE	<120	OT
NOR2013245	Northern fur seal	1	1	14/09/13 15:31:00	57.8934	-167.695	25	IS	LO	<120	OT
NOR2013246	Northern fur seal	1	0	14/09/13 16:11:00	57.7585	-167.65	100	CD	RE	<120	OT
FEN2013399	Unidentified pinniped	1	0	14/09/13 18:15:00	71.1428	-160.243	50	SP	TH	<120	OT
NOR2013247	Dall's porpoise	4	0	14/09/13 19:26:00	57.0693	-167.433	1088	NO	SW	<120	OT
NOR2013248	Northern fur seal	1	0	14/09/13 19:27:00	57.0656	-167.432	500	NO	RE	<120	OT
NOR2013249	Fin whale	1	0	14/09/13 19:37:00	57.0292	-167.421	818	NO	SW	<120	OT
NOR2013250	Northern fur seal	1	0	14/09/13 21:25:00	56.671	-167.313	75	LO	LO	<120	OT
NOR2013251	Dall's porpoise	4	0	15/09/13 08:13:00	54.5641	-166.675	200	NO	SW	<120	OT
NOR2013252	Harbor seal	1	0	15/09/13 08:49:00	54.453	-166.637	400	LO	SW	<120	OT
FEN2013400	Unidentified seal	1	0	15/09/13 08:57:00	71.0894	-166.973	50	NO	SW	<120	DP
NOR2013253	Fin whale	1	0	15/09/13 09:01:00	54.4153	-166.623	600	NO	SW	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
NOR2013254	Northern fur seal	1	0	15/09/13 09:17:00	54.368	-166.608	300	NO	RE	<120	OT
NOR2013255	Unidentified mysticete whale	1	0	15/09/13 10:04:00	54.2352	-166.565	5031	NO	BL	<120	OT
NOR2013256	Unidentified mysticete whale	1	0	15/09/13 10:14:00	54.2083	-166.557	1629	NO	FL	<120	OT
NOR2013257	Unidentified mysticete whale	1	0	15/09/13 10:15:00	54.2056	-166.556	5031	NO	BL	<120	OT
NOR2013258	Northern fur seal	2	0	15/09/13 10:29:00	54.1681	-166.544	50	LO	RE	<120	OT
NOR2013259	Dall's porpoise	30	0	15/09/13 10:49:00	54.1132	-166.528	800	NO	SW	<120	OT
NOR2013260	Harbor porpoise	5	0	15/09/13 10:51:00	54.1077	-166.527	600	NO	SW	<120	OT
NOR2013261	Northern fur seal	3	0	15/09/13 11:00:00	54.083	-166.52	1000	NO	RE	<120	OT
NOR2013262	Dall's porpoise	10	0	15/09/13 11:15:00	54.0423	-166.509	1000	NO	SW	<120	OT
NOR2013263	Humpback whale	3	0	15/09/13 11:26:00	54.0127	-166.501	3000	NO	BL	<120	OT
NOR2013264	Humpback whale	2	0	15/09/13 11:44:00	53.9655	-166.491	2500	NO	SW	<120	OT
FEN2013401	Unidentified pinniped	1	0	16/09/13 13:48:00	71.241	-166.699	50	SP	TH	<120	OT
FEN2013403	Bearded seal	1	0	17/09/13 17:52:00	71.5524	-165.818	100	NO	DI	<120	OT
FEN2013404	Unidentified mysticete whale	2	0	22/09/13 08:59:00	71.2396	-163.175	5015	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013405	Unidentified seal	1	0	22/09/13 10:36:00	71.2101	-162.923	35	LO	LO	<120	OT
FEN2013406	Pacific walrus	1	0	22/09/13 10:58:00	71.2037	-162.866	225	LO	SI	<120	OT
FEN2013407	Unidentified pinniped	1	0	22/09/13 11:22:00	71.1922	-162.824	1392	NO	SW	<120	OT
FEN2013408	Pacific walrus	2	1	22/09/13 11:56:00	71.1703	-162.933	25	CD	DI	<120	OT
FEN2013410	Bearded seal	1	0	22/09/13 13:04:00	71.1288	-163.171	175	NO	LO	<120	OT
FEN2013412	Pacific walrus	1	0	22/09/13 13:20:00	71.1187	-163.227	250	NO	DI	<120	OT
FEN2013411	Unidentified seal	1	0	22/09/13 13:21:00	71.1181	-163.23	125	LO	DI	<120	OT
FEN2013413	Unidentified seal	1	0	22/09/13 13:36:00	71.1086	-163.282	25	NO	RE	<120	OT
FEN2013414	Pacific walrus	3	0	22/09/13 14:08:00	71.1224	-163.317	1392	SP	SA	<120	OT
FEN2013415	Unidentified seal	1	0	22/09/13 14:12:00	71.1243	-163.305	612	NO	DI	<120	OT
FEN2013416	Unidentified pinniped	1	0	22/09/13 14:16:00	71.1263	-163.293	200	NO	DI	<120	OT
FEN2013417	Pacific walrus	2	1	22/09/13 14:19:00	71.1279	-163.284	275	LO	LO	<120	OT
FEN2013409	Pacific walrus	1	0	22/09/13 14:40:00	71.1388	-163.22	1084	NO	LO	<120	OT
FEN2013418	Unidentified seal	1	0	22/09/13 14:54:00	71.146	-163.178	300	NO	SW	<120	OT
FEN2013419	Bearded seal	1	0	22/09/13 15:55:00	71.1768	-162.994	50	LO	LO	<120	OT
FEN2013420	Bearded seal	1	0	22/09/13 16:10:00	71.1836	-162.955	175	LO	LO	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013421	Pacific walrus	3	0	22/09/13 16:27:00	71.1912	-162.909	200	NO	SI	<120	OT
FEN2013422	Pacific walrus	5	1	22/09/13 18:20:00	71.2387	-162.651	200	CD	ST	<120	OT
FEN2013423	Unidentified seal	1	0	22/09/13 18:30:00	71.2327	-162.68	350	LO	RE	<120	OT
FEN2013424	Unidentified seal	1	0	22/09/13 19:12:00	71.2479	-162.796	40	LO	LO	<120	OT
FEN2013425	Unidentified pinniped	1	0	22/09/13 19:27:00	71.254	-162.837	725	NO	LO	<120	OT
FEN2013426	Bearded seal	1	0	22/09/13 19:37:00	71.2582	-162.864	175	NO	SI	<120	OT
FEN2013427	Unidentified mysticete whale	2	0	22/09/13 20:44:00	71.2853	-163.047	5015	NO	BL	<120	OT
FEN2013428	Pacific walrus	3	0	22/09/13 20:45:00	71.2857	-163.05	1084	NO	TR	<120	OT
FEN2013430	Bearded seal	1	0	22/09/13 20:51:00	71.2883	-163.066	815	NO	SW	<120	OT
FEN2013429	Pacific walrus	3	0	22/09/13 20:51:00	71.2883	-163.066	1084	NO	ST	<120	OT
FEN2013431	Pacific walrus	2	1	22/09/13 21:35:00	71.306	-163.188	100	CD	SW	<120	OT
FEN2013432	Unidentified seal	1	0	23/09/13 09:12:00	71.2024	-163.638	50	LO	LO	<120	OT
FEN2013433	Bearded seal	1	0	23/09/13 10:37:00	71.1724	-163.36	200	SP	PO	<120	OT
FEN2013434	Unidentified mysticete whale	2	0	23/09/13 19:04:00	71.1868	-163.16	10000	NO	BL	120-159	ST
FEN2013435	Unidentified mysticete whale	2	0	23/09/13 19:10:00	71.1866	-163.142	1800	NO	TR	120-159	ST

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013436	Pacific walrus	1	0	24/09/13 11:10:00	71.1597	-163.243	50	IS	TH	≥160	LS
FEN2013437	Unidentified seal	1	0	24/09/13 15:58:00	71.1892	-163.159	85	LO	LO	<120	OT
FEN2013438	Unidentified mysticete whale	2	0	24/09/13 17:33:00	71.1833	-163.267	2435	NO	BL	<120	OT
FEN2013439	Pacific walrus	1	0	25/09/13 12:46:00	71.2811	-163.174	30	IS	LO	≥160	SH
FEN2013440	Pacific walrus	1	0	27/09/13 09:19:00	70.5625	-164.854	40	SP	DI	<120	OT
FEN2013441	Gray whale	8	0	29/09/13 13:20:00	65.2446	-168.504	30	NO	SA	<120	OT
FEN2013442	Gray whale	16	0	29/09/13 14:17:00	65.1079	-168.504	752	NO	BL	<120	OT
FEN2013443	Gray whale	16	0	29/09/13 14:40:00	65.0535	-168.505	752	NO	BL	<120	OT
FEN2013444	Gray whale	27	0	29/09/13 15:20:00	64.9385	-168.505	70	NO	FL	<120	OT
FEN2013445	Gray whale	10	0	29/09/13 16:14:00	64.8178	-168.405	653	NO	FL	<120	OT
FEN2013446	Gray whale	2	0	29/09/13 16:55:00	64.7154	-168.321	1084	NO	FE	<120	OT
FEN2013447	Gray whale	2	0	29/09/13 18:54:00	64.4137	-168.081	1200	NO	BL	<120	OT
FEN2013448	Unidentified mysticete whale	1	0	29/09/13 19:28:00	64.3257	-168.017	5015	NO	BL	<120	OT
FEN2013449	Gray whale	1	0	29/09/13 19:29:00	64.3231	-168.015	1623	NO	FL	<120	OT
FEN2013450	Gray whale	2	0	29/09/13 20:01:00	64.2401	-167.954	5015	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013451	Gray whale	1	0	30/09/13 10:42:00	61.8952	-167.534	1000	NO	BL	<120	OT
FEN2013452	Killer whale	3	0	30/09/13 13:38:00	61.4424	-167.786	1392	NO	TR	<120	OT
FEN2013453	Northern fur seal	1	0	01/10/13 09:33:00	58.1721	-168.364	25	IS	PO	<120	OT
FEN2013454	Northern fur seal	1	0	01/10/13 12:48:00	57.6201	-168.352	70	LO	LO	<120	OT
FEN2013455	Northern fur seal	1	0	01/10/13 12:50:00	57.6146	-168.352	100	LO	LO	<120	OT
FEN2013456	Northern fur seal	2	0	01/10/13 12:52:00	57.6092	-168.351	5	NO	SW	<120	OT
FEN2013457	Unidentified mysticete whale	1	0	01/10/13 12:54:00	57.6037	-168.351	1000	NO	BL	<120	OT
FEN2013458	Northern fur seal	1	0	01/10/13 13:09:00	57.5642	-168.35	40	NO	SW	<120	OT
FEN2013459	Northern fur seal	1	0	01/10/13 13:11:00	57.5593	-168.35	20	NO	SW	<120	OT
FEN2013461	Northern fur seal	1	0	01/10/13 13:18:00	57.5414	-168.349	70	CD	PO	<120	OT
FEN2013460	Northern fur seal	1	0	01/10/13 13:46:00	57.4695	-168.341	225	NO	PO	<120	OT
FEN2013462	Northern fur seal	1	0	01/10/13 14:05:00	57.4218	-168.337	75	LO	LO	<120	OT
FEN2013463	Fin whale	3	0	01/10/13 14:58:00	57.2883	-168.318	40	CD	ST	<120	OT
FEN2013464	Northern fur seal	1	0	01/10/13 15:05:00	57.2748	-168.318	100	NO	LO	<120	OT
FEN2013465	Fin whale	1	0	01/10/13 15:13:00	57.2563	-168.32	200	NO	BL	<120	OT

Sighting ID[a]	Species	No.[b]	Juveniles	Date (AKDT, DD/MM/YY) and Time	Lat. (°N)	Long. (°W)	Final Distance To Observer[c] (m)	Reaction[d]	Behav.[e]	Final Exposure Level[f]	Vessel Activity[g]
FEN2013466	Unidentified mysticete whale	1	0	01/10/13 15:22:00	57.2361	-168.322	888	NO	BL	<120	OT
FEN2013467	Northern fur seal	1	0	01/10/13 15:35:00	57.2033	-168.323	25	LO	LO	<120	OT
FEN2013468	Northern fur seal	1	0	01/10/13 15:49:00	57.1658	-168.325	100	NO	SW	<120	OT
FEN2013469	Northern fur seal	1	0	01/10/13 17:42:00	56.8633	-168.315	30	LO	PO	<120	OT

[a] Sighting ID = Vessel name, year (2013) and sequential number given to sighting by PSOs. FEN = *Fennica*, NOR = *Nordica*.

[b] No. = Number of individual marine mammals observed during sighting.

[c] Final Dist. to Observer = Sighting distance (m) of marine mammal(s) from the PSO's at the marine mammal(s) closest point of approach.

[d] Reaction to Vessel = Reaction of marine mammal(s) to vessel observed by PSOs. Codes: CD = Change in Direction; IS = Increase in Speed; LO = Look at Vessel; NO = No reaction; SP = Splash.

[e] Behavior = Initial behavior of marine mammal(s) observed by PSOs. Codes: BL = Blow; BR=Breach; DE=Dead; DI = Dive; FE=Feeding; FL = Fluking; LG = Logging; LO = Look; MI = Milling; OT=Other; PO=Porpoising; RE = Resting; SA = Surface Active; SI = Sink; ST = Surface Active Travel; SW = Swim; TH = Thrash; TR = Travelling; WK = Walking; U = Unknown.

[f] Final Exposure Level = Modeled received sound level in dB re 1µPa (rms) at the location of the sighted animal(s). 120 dB (rms) is the level at which behavioral disturbance of marine mammals might be expected. 160 dB (rms) is the first level at which mitigation measures were required by Shell's IHA and LOA (for groups of ≥ 12 bowhead whales, gray whales, or Pacific Walrus).

[f] Vessel Activity = Vessel activity at the time of the initial detection. Codes: DP = Deploying Survey Gear; DY=Dynamic Positioning; ID = Idle; LS = Seismic Line Shooting; OT = Other (e.g., transit); RC = Recovering Survey Gear; RU = Ramp up of Airguns; SH = Shooting Airguns Offline (e.g., turning, leading-in, leading-out); ST=Seismic Testing (e.g. after re-deploying airguns after repair).

Section 2: Weekly Sightings Maps

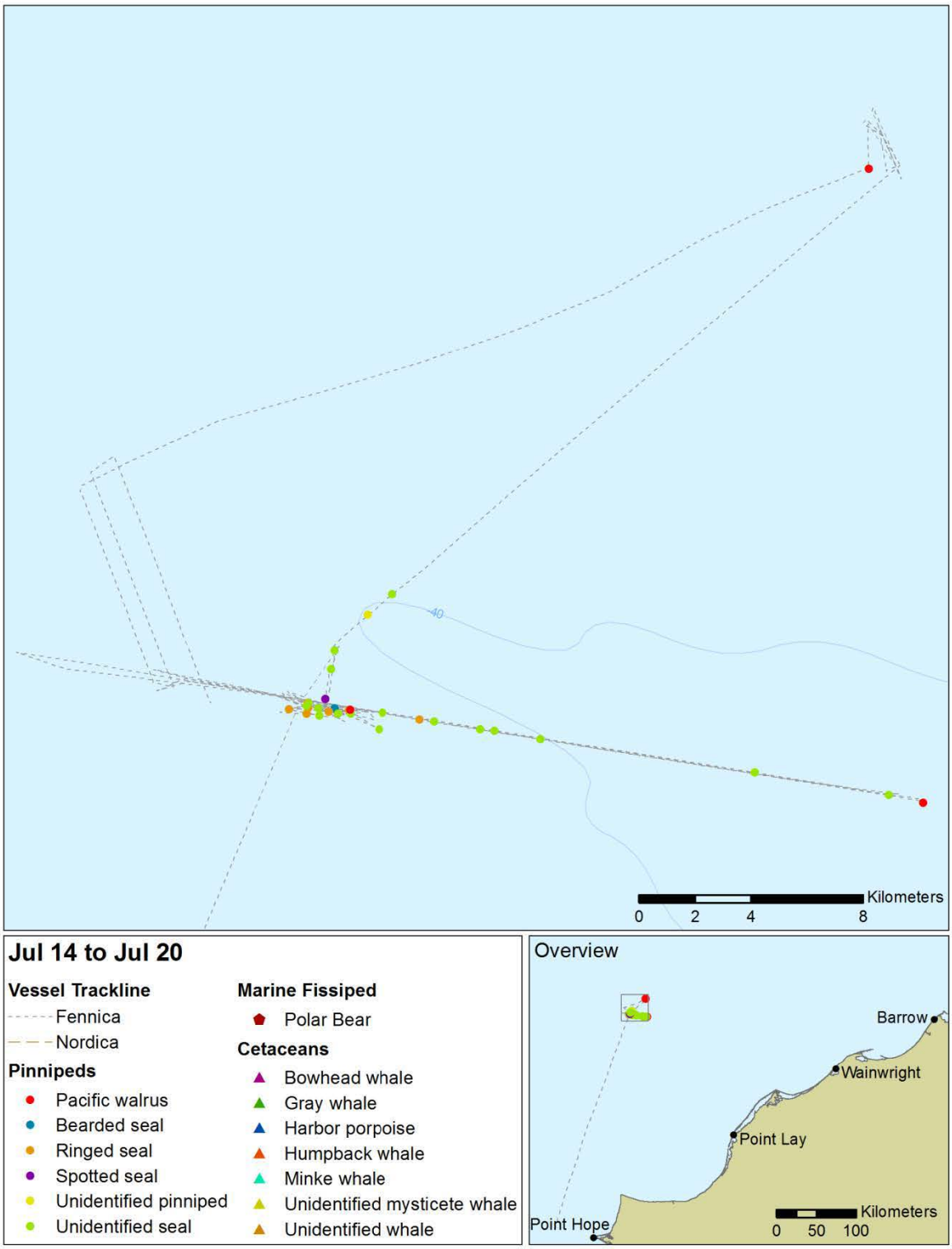

FIGURE I.1. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 14 Jul–20 Jul 2013.

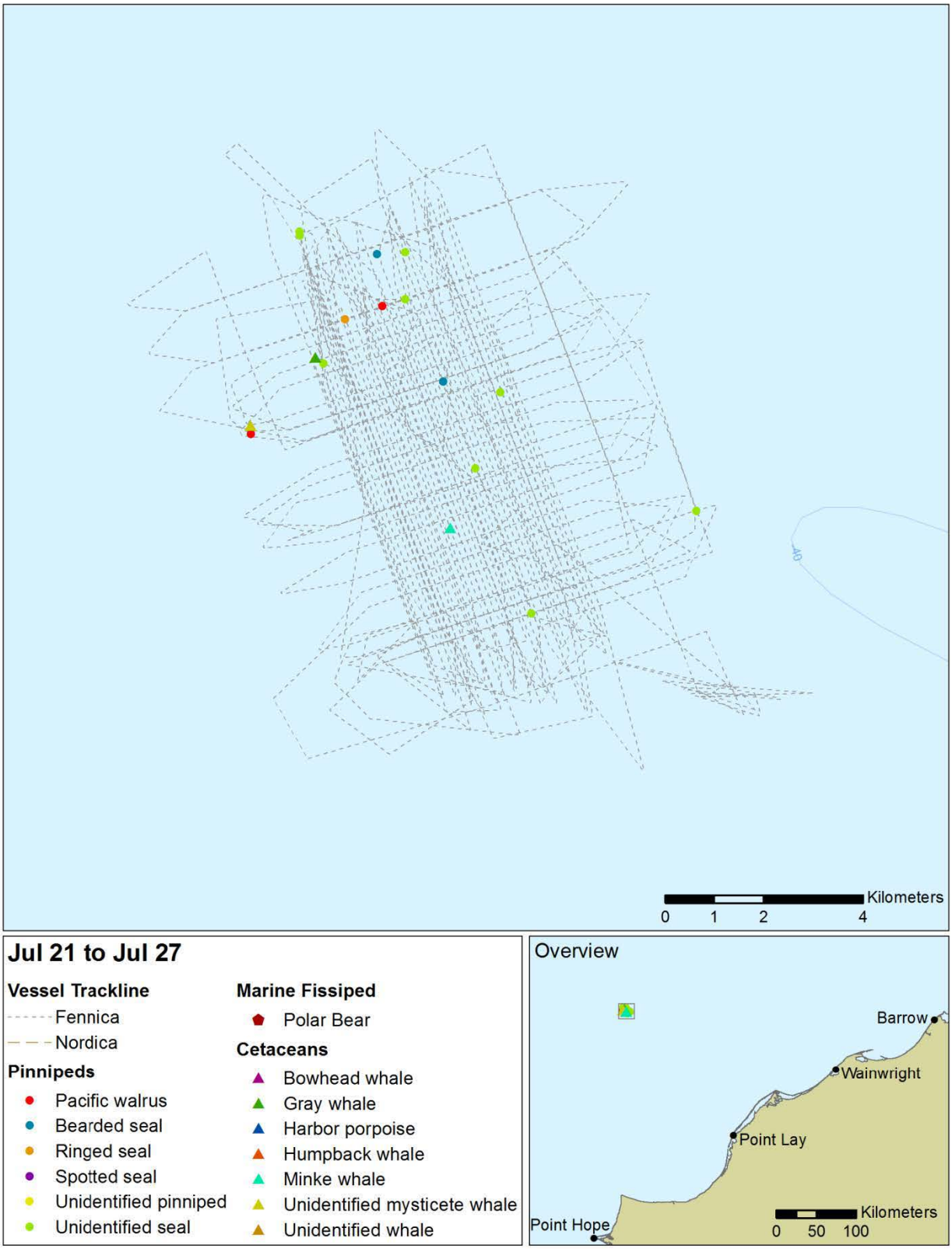

FIGURE I.2. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 21 Jul–27 Jul 2013.

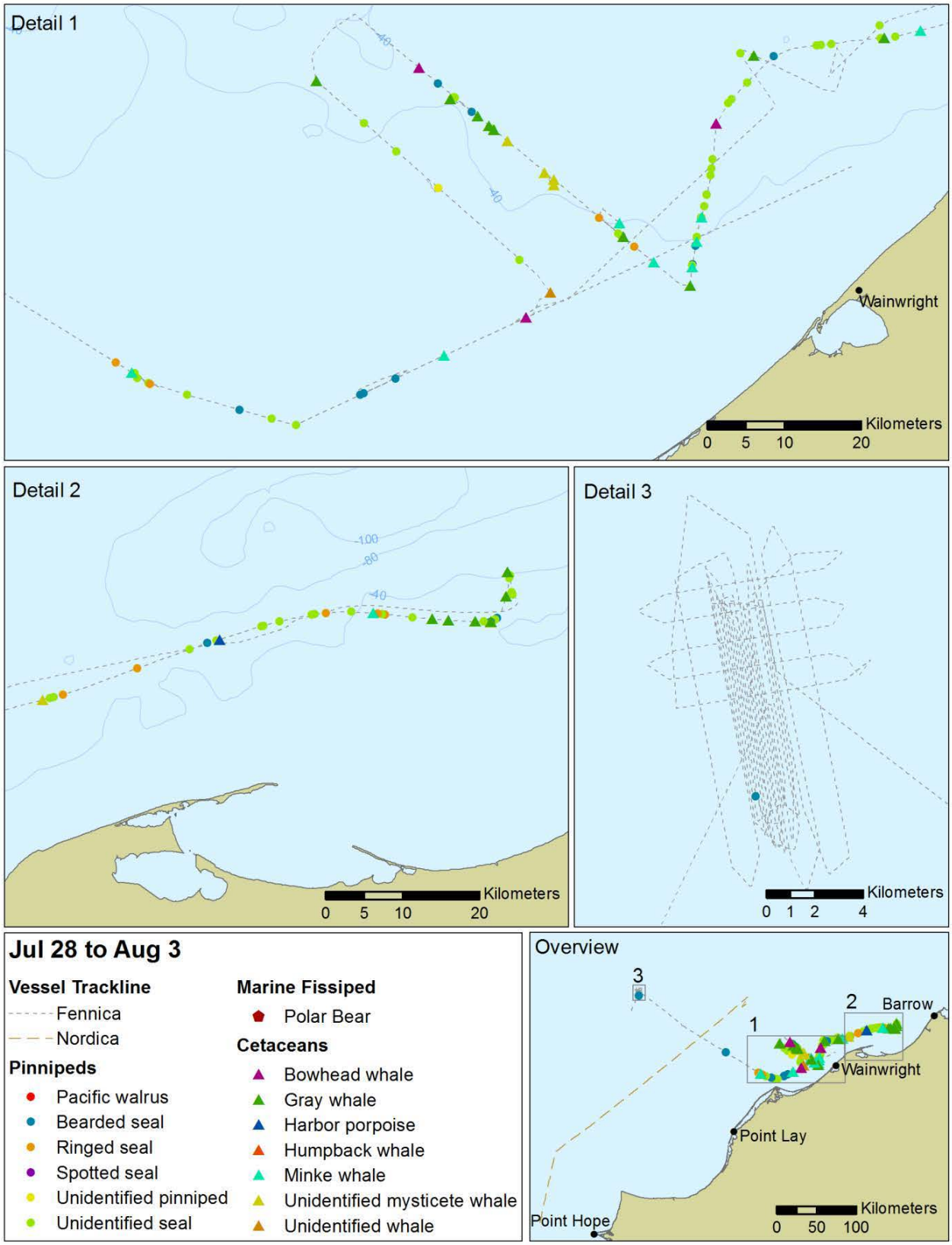

FIGURE I.3. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 28 Jul–3 Aug 2013.

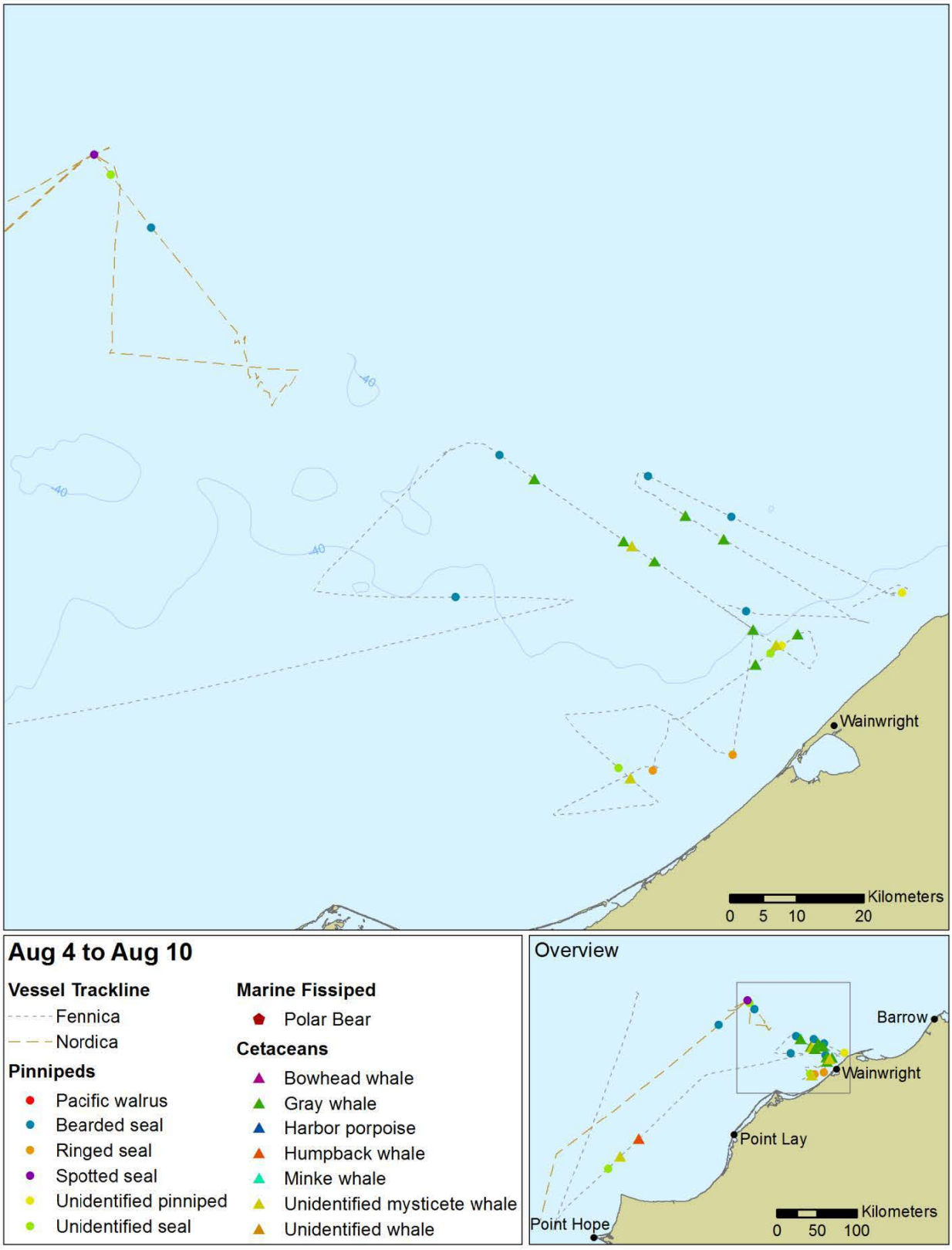

FIGURE I.4. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 4 Aug–10 Aug 2013.

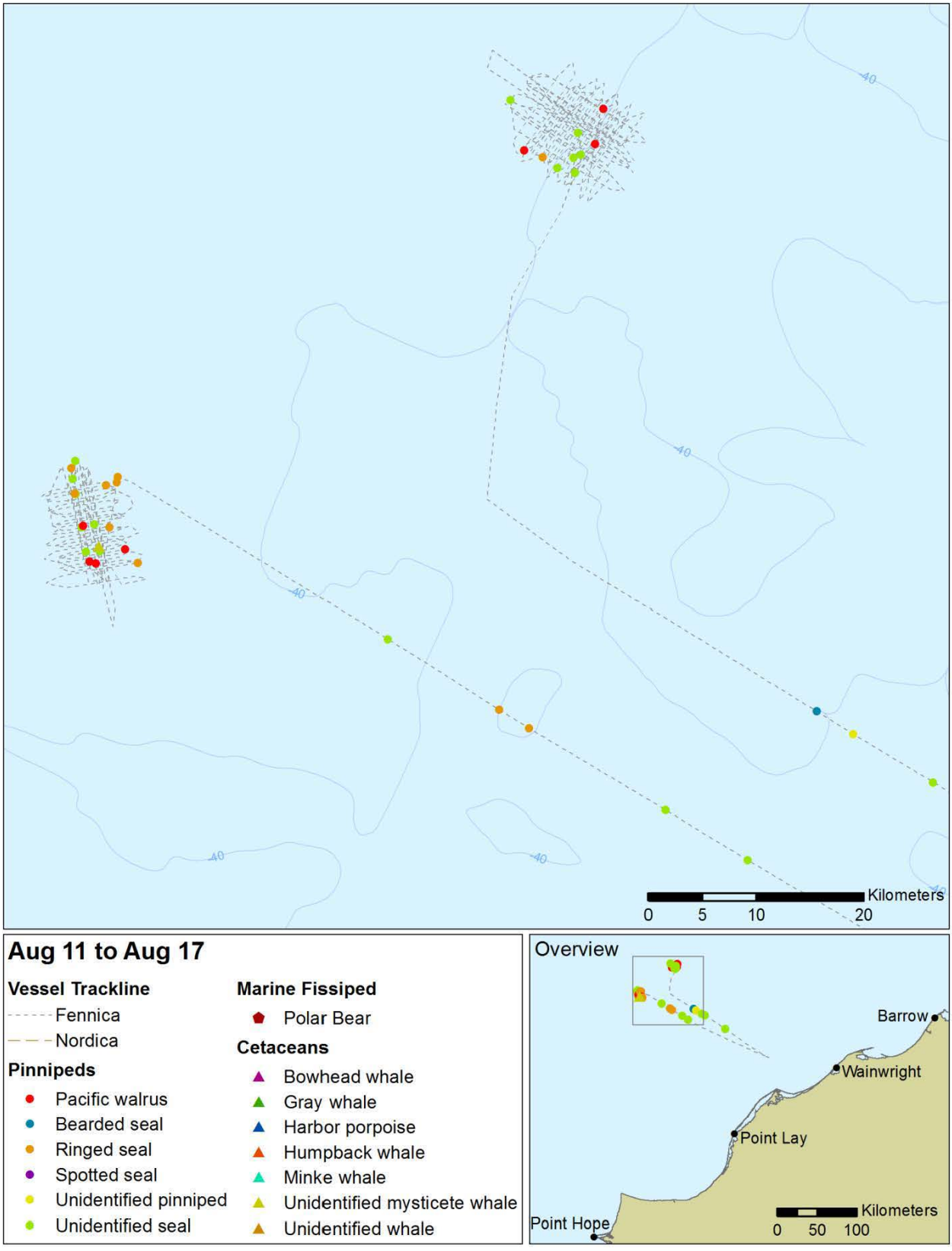

FIGURE I.5. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 11 Aug–17 Aug 2013.

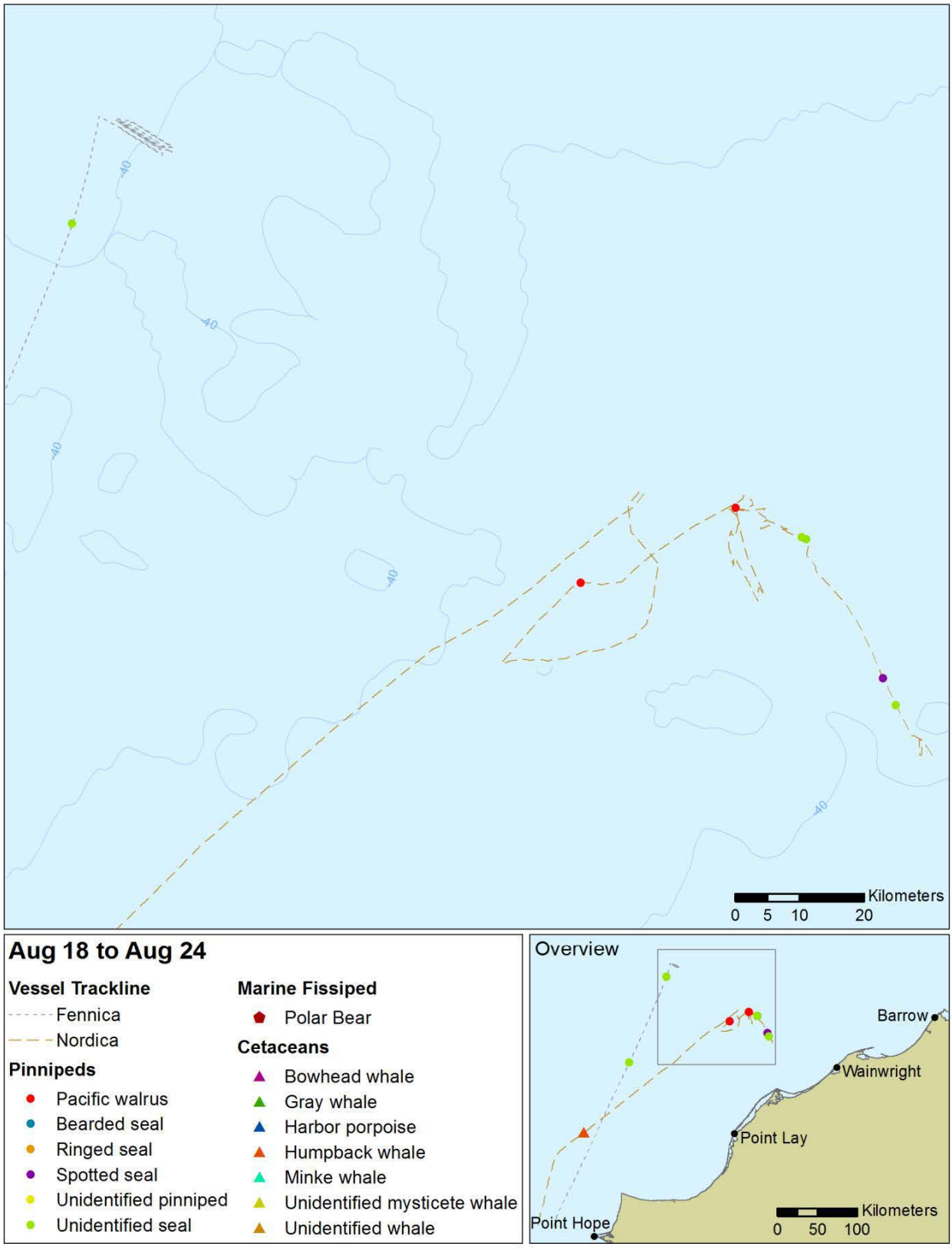

FIGURE I.6. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 18 Aug–24 Aug 2013.

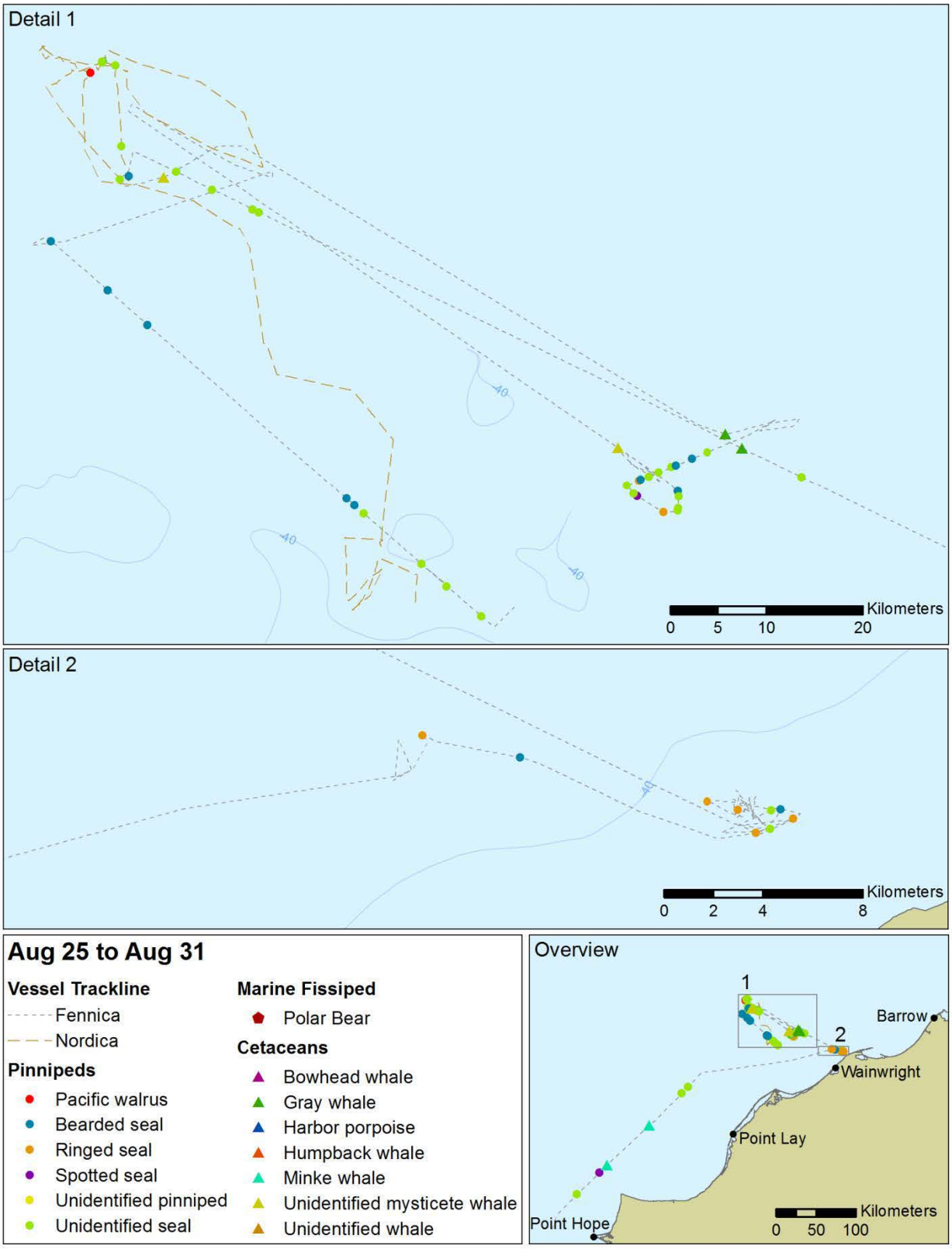

FIGURE I.7. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 25 Aug–31 Aug 2013.

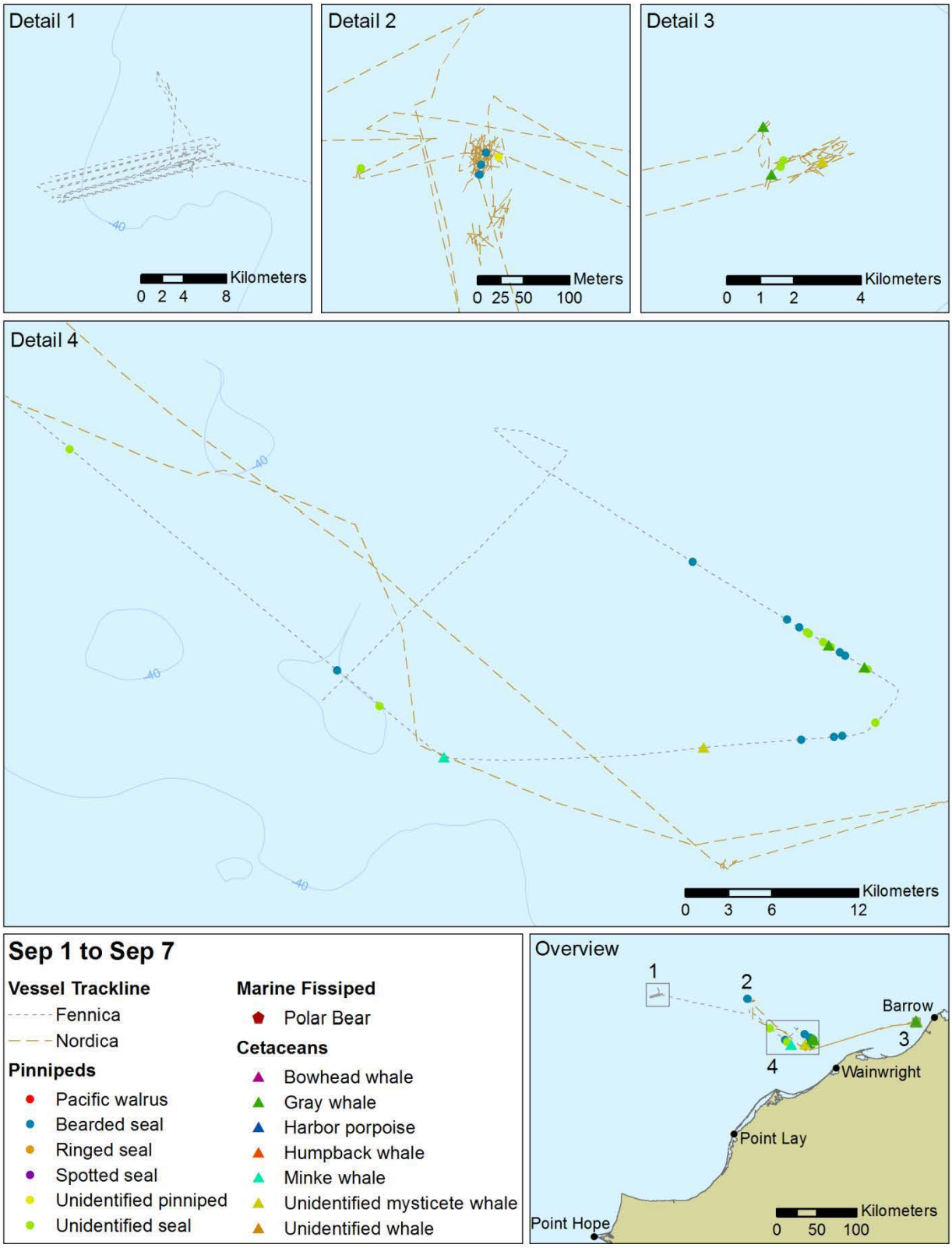

FIGURE I.8. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 1 Sep–7 Sep 2013.

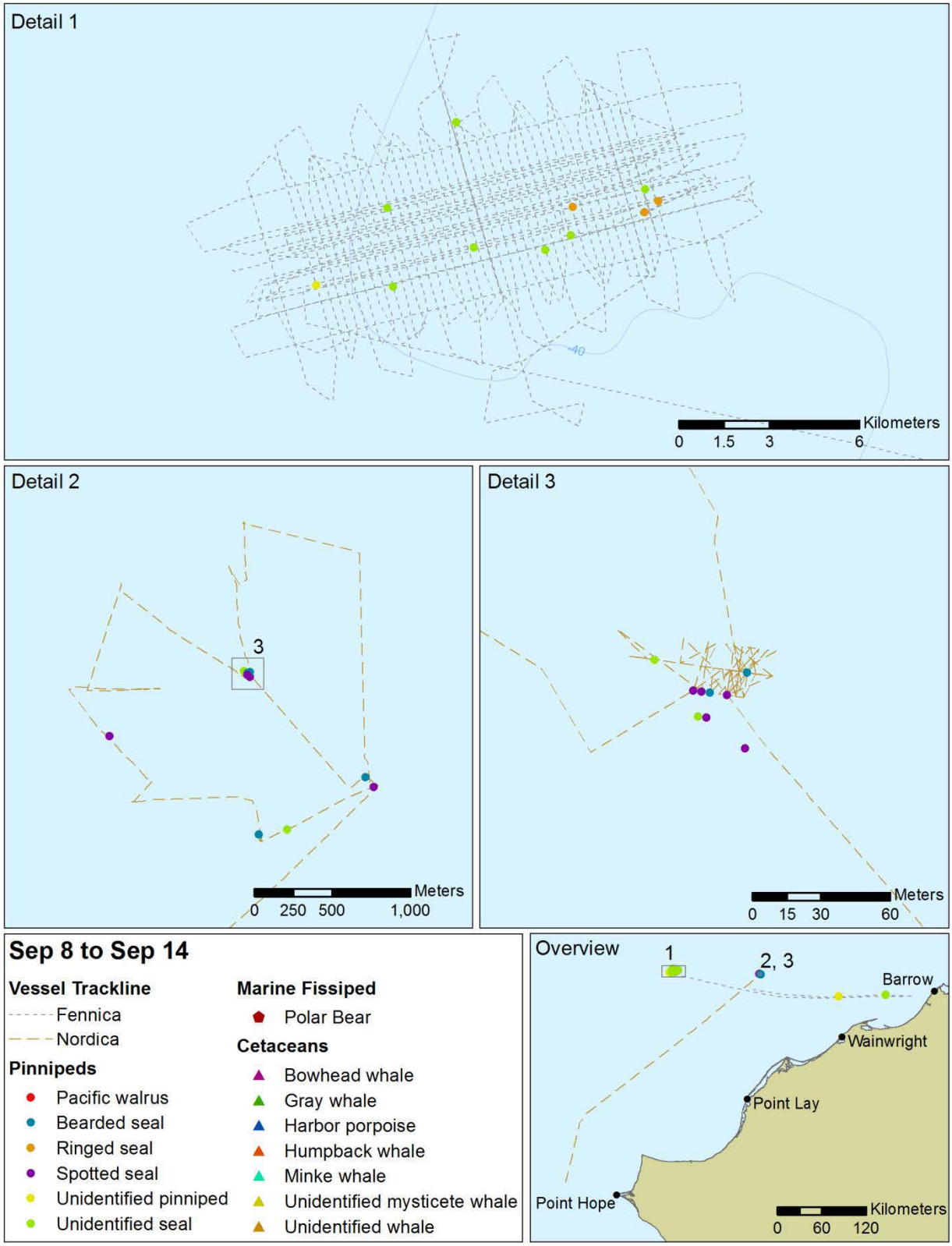

FIGURE I.9. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 8 Sep–14 Sep 2013.

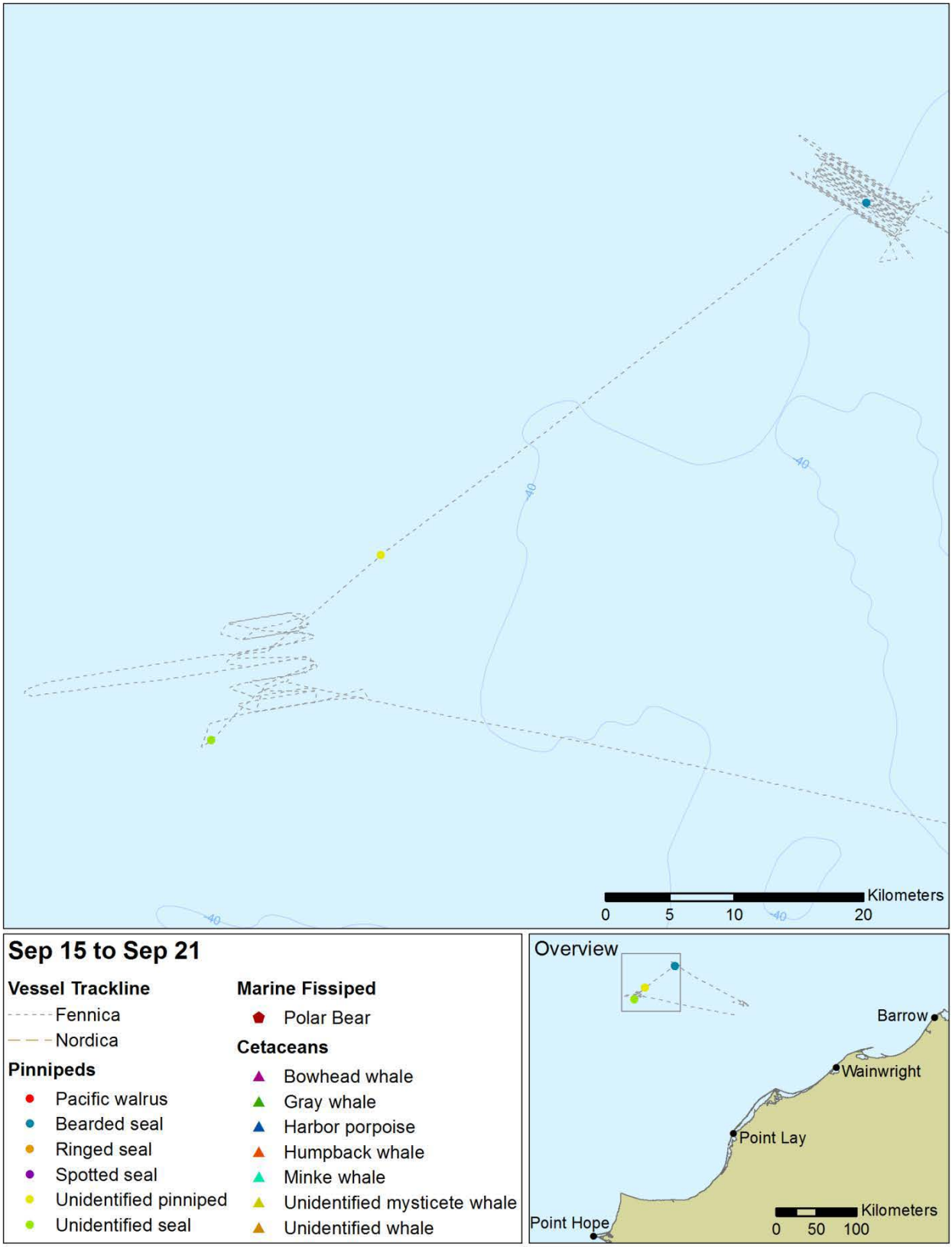

FIGURE I.10. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 15 Sep–21 Sep 2013.

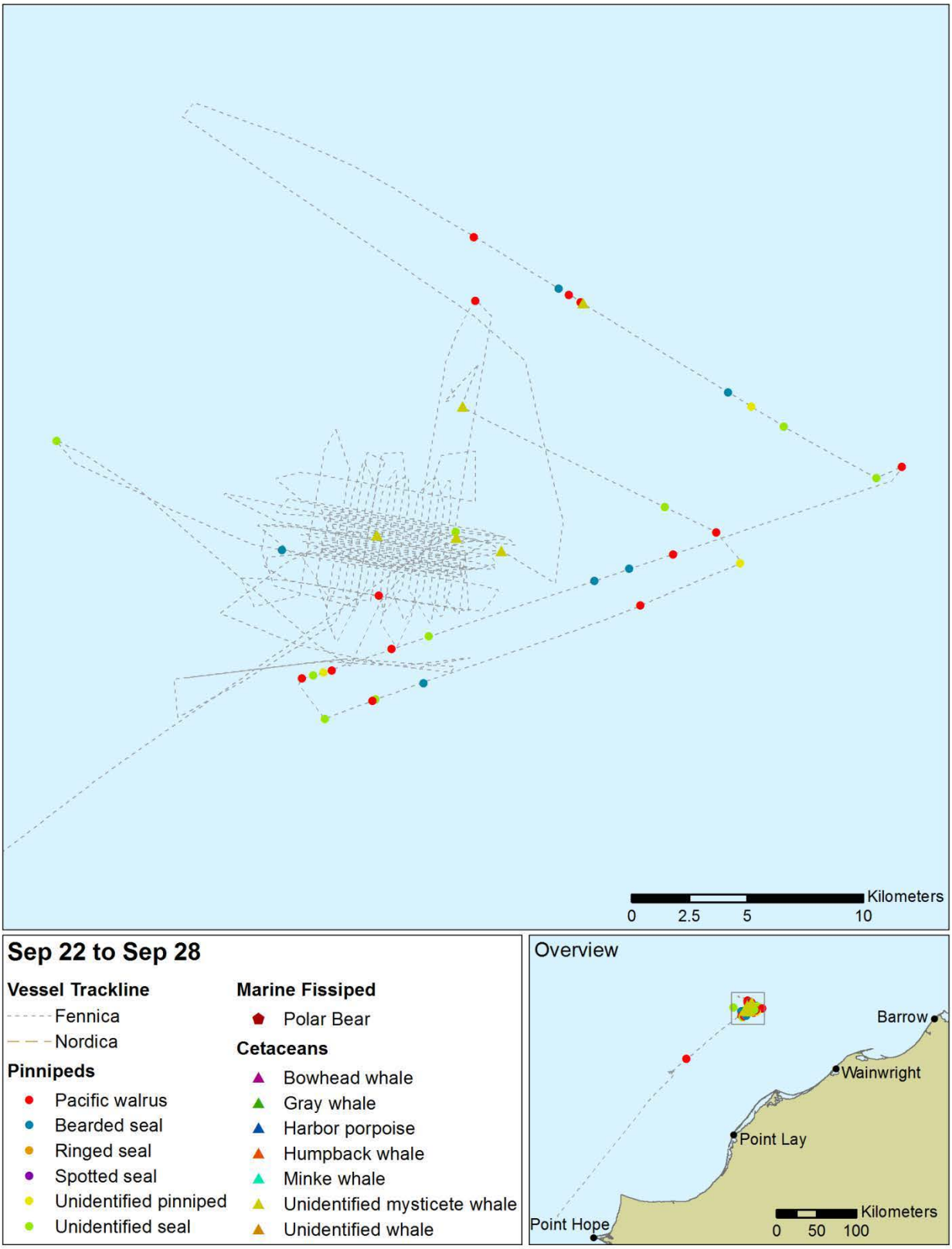

FIGURE I.11. Vessel tracklines for the *Fennica* and *Nordica* and all marine mammal detections in the Chukchi Sea from 22 Sep–28 Sep 2013.

Section 3: Data that Met Analysis Criteria

Data presented in part one met the analysis criteria and were used to calculate sighting rates and closest point of approach (CPAs) for marine mammals sighted from the *Fennica* and *Nordica*. The analysis criteria are described in detail in Chapter 4.

Fennica

Cetaceans

The tables below present the periods of effort that met the criteria for being able to reliably detect cetaceans and the sightings that occurred during those periods from the *Fennica*.

TABLE I.2. Cetacean effort by Beaufort wind force and vessel activity from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Seismic	0	71	248	637	220	91	***1267***
Non-seismic	50	204	876	1368	1198	510	***4206***
Total (km)	***50***	***275***	***1124***	***2005***	***1418***	***601***	***5473***

TABLE I.3. Cetacean sightings by Beaufort wind force and vessel activity from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Seismic	--	0	0	3	0	0	***3***
Non-seismic	10	9	20	9	8	1	***57***
Total	***10***	***9***	***20***	***12***	***8***	***1***	***60***

TABLE I.4. Cetacean effort by number of PSOs and vessel activity from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Number of PSOs**			
	1	**2**	**3**	***n***
Seismic	49	1213	5	*1267*
Non-seismic	291	3892	23	*4206*
Total (km)	***340***	***5105***	***28***	***5473***

TABLE I.5. Cetacean sightings by number of PSOs and vessel activity from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

	Number of PSOs			
***Fennica* Vessel Activity**	**1**	**2**	**3**	***n***
Seismic	0	3	0	***3***
Non-seismic	2	55	0	***57***
Total	***2***	***58***	***0***	***60***

TABLE I.6. Cetacean effort by seismic status from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

	Seismic Status			
Fennica	**Full array**	**Mitigation airgun**	**Non-seismic**	***n***
Effort (km)	909	358	4206	***5473***
Total	***909***	***358***	***4206***	***5473***

TABLE I.7. Cetacean sightings by seismic status from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

	Seismic Status			
Fennica	**Full array**	**Mitigation airgun**	**Non-seismic**	***n***
Sightings	3	0	57	***60***
Total	***3***	***0***	***57***	***60***

Pinnipeds

The tables below present the periods of effort that met the criteria for being able to reliably detect pinnipeds and the sightings that occurred during those periods from the *Fennica*.

TABLE I.8. Pinniped effort by Beaufort wind force and vessel activity from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Seismic	0	71	248	637	220	91	***1267***
Non-seismic	50	204	876	1368	1198	510	***4206***
Total (km)	***50***	***275***	***1124***	***2005***	***1418***	***601***	***5473***

TABLE I.9. Pinniped sightings by Beaufort wind force and vessel activity from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Seismic	--	3	5	2	0	1	***11***
Non-seismic	12	62	78	28	8	3	***191***
Total	***12***	***65***	***83***	***30***	***8***	***4***	***202***

TABLE I.10. Pinniped effort by number of PSOs and vessel activity from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Number of PSOs**			
	1	**2**	**3**	***n***
Seismic	0	11	0	***11***
Non-seismic	2	189	0	***191***
Total	***2***	***200***	***0***	***202***

TABLE I.11. Pinniped sightings by number of PSOs and vessel activity from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Number of PSOs**			
	1	**2**	**3**	***n***
Seismic	49	1213	5	*1267*
Non-seismic	291	3892	23	*4206*
Total (km)	***340***	***5105***	***28***	***5473***

TABLE I.12. Pinniped effort by seismic status from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

Fennica	Seismic Status			
	Full array	**Mitigation airgun**	**Non-seismic**	***n***
Effort (km)	909	358	4206	***5473***
Total	***909***	***358***	***4206***	***5473***

TABLE I.13. Pinniped sightings by seismic status from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

Fennica	Seismic Status			
	Full array	**Mitigation airgun**	**Non-seismic**	***n***
Sightings	4	7	191	***202***
Total	***4***	***7***	***191***	***202***

Pacific Walruses

The tables below present the periods of effort that met the criteria for being able to reliably detect Pacific walrus and the sightings that occurred during those periods from the *Fennica*.

TABLE I.14. Pacific walrus effort by Beaufort wind force and vessel activity from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Seismic	0	71	248	637	220	91	***1267***
Non-seismic	50	204	876	1368	1198	510	***4206***
Total (km)	***50***	***275***	***1124***	***2005***	***1418***	***601***	***5473***

TABLE I.15. Pacific walrus sightings by Beaufort wind force and vessel activity from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Seismic	--	2	4	2	0	0	***8***
Non-seismic	0	2	11	3	0	0	***16***
Total	***0***	***4***	***15***	***5***	***0***	***0***	***24***

TABLE I.16. Pacific walrus by number of PSOs and vessel activity from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Number of PSOs**			
	1	**2**	**3**	***n***
Seismic	49	1213	5	*1267*
Non-seismic	291	3892	23	*4206*
Total (km)	***340***	***5105***	***28***	***5473***

TABLE I.17. Pacific walrus sightings by number of PSOs and vessel activity from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

***Fennica* Vessel Activity**	**Number of PSOs**			
	1	**2**	**3**	***n***
Seismic	0	8	0	***8***
Non-seismic	1	15	0	***16***
Total	***1***	***23***	***0***	***24***

TABLE I.18. Pacific walrus effort by seismic status from the *Fennica* (km) during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

Fennica	**Seismic Status**			
	Full array	**Mitigation airgun**	**Non-seismic**	***n***
Effort (km)	909	358	4206	***5473***
Total	***909***	***358***	***4206***	***5473***

TABLE I.19. Pacific walrus sightings by seismic status from the *Fennica* during Shell's shallow hazards and ice gouge surveys, 17 Jul to 28 Sep 2013.

Fennica	**Seismic Status**			
	Full array	**Mitigation airgun**	**Non-seismic**	***n***
Sightings	6	2	16	***24***
Total	***6***	***2***	***16***	***24***

Nordica

Cetaceans

The tables below present the periods of effort that met the criteria for being able to reliably detect cetaceans and the sightings that occurred during those periods from the *Nordica.*

TABLE I.20. Cetacean effort by Beaufort wind force and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	0	0	2	4	4	8	***18***
Off-prospect	0	17	217	292	191	137	***854***
Total (km)	***0***	***17***	***219***	***296***	***195***	***145***	***872***
Stationary							
On-prospect	1	11	53	41	26	45	***177***
Off-prospect	0	2	74	28	11	12	***127***
Total (h)	***1***	***13***	***127***	***69***	***37***	***57***	***304***

TABLE I.21. Cetacean sightings by Beaufort wind force and vessel status from the *Nordica* for moving stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	--	--	0	0	0	0	***0***
Off-prospect	--	0	0	1	0	0	***1***
Total	***--***	***0***	***0***	***1***	***0***	***0***	***1***
Stationary							
On-prospect	0	0	0	0	0	0	***0***
Off-prospect	--	0	0	0	1	1	***2***
Total	***0***	***0***	***0***	***0***	***1***	***1***	***2***

TABLE I.22. Cetacean effort by number of PSOs and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	0	17	0	***17***
Off-prospect	0	854	0	***854***
Total (km)	***0***	***871***	***0***	***871***
Stationary				
On-prospect	2	175	0	***177***
Off-prospect	1	126	1	***128***
Total (h)	***3***	***301***	***1***	***305***

TABLE I.23. Cetacean sightings by number of PSOs and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	--	0	--	***0***
Off-prospect	--	1	--	***1***
Total	***--***	***1***	***--***	***1***
Stationary				
On-prospect	0	0	--	***0***
Off-prospect	0	2	0	***2***
Total	***0***	***2***	***0***	***2***

TABLE I.24. Cetacean effort by vessel activity and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	0	<0.5	17	***17***
Off-prospect	0	2	851	***853***
Total (km)	***0***	***2***	***868***	***870***
Stationary				
On-prospect	157	17	3	***177***
Off-prospect	47	73	7	***127***
Total (h)	***204***	***90***	***10***	***304***

TABLE I.25. Cetacean sightings by vessel activity and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	--	0	0	***0***
Off-prospect	--	1	0	***1***
Total	***--***	***1***	***0***	***1***
Stationary				
On-prospect	0	0	0	***0***
Off-prospect	0	2	0	***2***
Total	***0***	***2***	***0***	***2***

Pinnipeds

The tables below present the periods of effort that met the criteria for being able to reliably detect pinnipeds and the sightings that occurred during those periods from the *Nordica.*

TABLE I.26. Pinniped effort by Beaufort wind force and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	0	0	2	4	4	8	***18***
Off-prospect	0	17	217	292	191	137	***854***
Total (km)	***0***	***17***	***219***	***296***	***195***	***145***	***872***
Stationary							
On-prospect	1	11	53	41	26	45	***177***
Off-prospect	0	2	74	28	11	12	***127***
Total (h)	***1***	***13***	***127***	***69***	***37***	***57***	***304***

TABLE I.27. Pinniped sightings by Beaufort wind force and vessel status from the *Nordica* for moving stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	--	--	0	0	0	0	***0***
Off-prospect	--	0	2	0	1	0	***3***
Total	***--***	***0***	***2***	***0***	***1***	***0***	***3***
Stationary							
On-prospect	1	0	5	4	5	1	***16***
Off-prospect	--	0	4	0	1	0	***5***
Total	***1***	***0***	***9***	***4***	***6***	***1***	***21***

TABLE I.28. Pinniped effort by number of PSOs and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	0	17	0	***17***
Off-prospect	0	854	0	***854***
Total (km)	***0***	***871***	***0***	***871***
Stationary				
On-prospect	2	175	0	***177***
Off-prospect	1	126	1	***128***
Total (h)	***3***	***301***	***1***	***305***

TABLE I.29. Pinniped sightings by number of PSOs and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	--	0	--	***--***
Off-prospect	--	3	--	***3***
Total	***--***	***3***	***--***	***3***
Stationary				
On-prospect	0	16	--	***16***
Off-prospect	0	5	0	***5***
Total	***0***	***21***	***0***	***21***

TABLE I.30. Pinniped effort by vessel activity and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	0	<0.5	17	***17***
Off-prospect	0	2	851	***853***
Total (km)	***0***	***2***	***868***	***870***
Stationary				
On-prospect	157	17	3	***177***
Off-prospect	47	73	7	***127***
Total (h)	***204***	***90***	***10***	***304***

TABLE I.31. Pinniped sightings by vessel activity and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	--	0	0	***0***
Off-prospect	--	1	2	***3***
Total	***--***	***1***	***2***	***3***
Stationary				
On-prospect	16	0	0	***16***
Off-prospect	0	2	3	***5***
Total	***16***	***2***	***3***	***21***

Pacific Walruses

The tables below present the periods of effort that met the criteria for being able to reliably detect Pacific walruses and the sightings that occurred during those periods from the *Nordica*.

TABLE I.32. Pacific walrus effort by Beaufort wind force and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	0	0	2	4	4	8	***18***
Off-prospect	0	17	217	292	191	137	***854***
Total (km)	***0***	***17***	***219***	***296***	***195***	***145***	***872***
Stationary							
On-prospect	1	11	53	41	26	45	***177***
Off-prospect	0	2	74	28	11	12	***127***
Total (h)	***1***	***13***	***127***	***69***	***37***	***57***	***304***

TABLE I.33. Pacific walrus sightings by Beaufort wind force and vessel status from the *Nordica* for moving stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	--	--	0	0	0	0	***0***
Off-prospect	--	0	1	0	0	0	***1***
Total	***--***	***0***	***1***	***0***	***0***	***0***	***1***
Stationary							
On-prospect	0	0	0	1	0	0	***1***
Off-prospect	--	0	0	0	0	0	***0***
Total	***0***	***0***	***0***	***1***	***0***	***0***	***1***

TABLE I.34. Pacific walrus effort by number of PSOs and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	0	17	0	***17***
Off-prospect	0	854	0	***854***
Total (km)	***0***	***871***	***0***	***871***
Stationary				
On-prospect	2	175	0	***177***
Off-prospect	1	126	1	***128***
Total (h)	***3***	***301***	***1***	***305***

TABLE I.35. Pacific walrus sightings by number of PSOs and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	--	0	--	***0***
Off-prospect	--	1	--	***1***
Total	***--***	***1***	***--***	***1***
Stationary				
On-prospect	0	0	--	***0***
Off-prospect	0	1	0	***1***
Total	***0***	***1***	***0***	***1***

TABLE I.36. Pacific walrus effort by vessel activity and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	0	<0.5	17	***17***
Off-prospect	0	2	851	***853***
Total (km)	***0***	***2***	***868***	***870***
Stationary				
On-prospect	157	17	3	***177***
Off-prospect	47	73	7	***127***
Total (h)	***204***	***90***	***10***	***304***

TABLE I.37. Pacific walrus sightings by vessel activity and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	--	0	0	***0***
Off-prospect	--	0	1	***1***
Total	***--***	***0***	***1***	***1***
Stationary				
On-prospect	0	0	1	***1***
Off-prospect	0	0	0	***0***
Total	***0***	***0***	***1***	***1***

Polar Bears

The tables below present the periods of effort that met the criteria for being able to reliably detect polar bears and the sightings that occurred during those periods from the *Nordica.*

TABLE I.38. Polar bear effort by Beaufort wind force and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	0	0	2	4	4	8	***18***
Off-prospect	0	17	217	292	191	137	***854***
Total (km)	***0***	***17***	***219***	***296***	***195***	***145***	***872***
Stationary							
On-prospect	1	11	53	41	26	45	***177***
Off-prospect	0	2	74	28	11	12	***127***
Total (h)	***1***	***13***	***127***	***69***	***37***	***57***	***304***

TABLE I.39. Polar bear sightings by Beaufort wind force and vessel status from the *Nordica* for moving stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Beaufort Wind Force**						
	0	**1**	**2**	**3**	**4**	**5**	***n***
Moving							
On-prospect	--	--	0	0	0	0	***0***
Off-prospect	--	0	2	0	0	0	***2***
Total	***--***	***0***	***2***	***0***	***0***	***0***	***2***
Stationary							
On-prospect	0	0	0	0	0	0	***0***
Off-prospect	--	0	0	0	0	0	***0***
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***

TABLE I.40. Polar bear effort by number of PSOs and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	0	17	0	***17***
Off-prospect	0	854	0	***854***
Total (km)	***0***	***871***	***0***	***871***
Stationary				
On-prospect	2	175	0	***177***
Off-prospect	1	126	1	***128***
Total (h)	***3***	***301***	***1***	***305***

TABLE I.41. Polar bear sightings by number of PSOs and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Number of PSOs**			
	1	**2**	**3**	***n***
Moving				
On-prospect	--	0	--	***0***
Off-prospect	--	2	--	***2***
Total	***--***	***2***	***--***	***2***
Stationary				
On-prospect	0	0	--	***0***
Off-prospect	0	0	0	***0***
Total	***0***	***0***	***0***	***0***

TABLE I.42. Polar bear effort by vessel activity and vessel status from the *Nordica* for moving periods (km) and stationary periods (h) during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	0	<0.5	17	***17***
Off-prospect	0	2	851	***853***
Total (km)	***0***	***2***	***868***	***870***
Stationary				
On-prospect	157	17	3	***177***
Off-prospect	47	73	7	***127***
Total (h)	***204***	***90***	***10***	***304***

TABLE I.43. Polar bear sightings by vessel activity and vessel status from the *Nordica* for moving and stationary periods during Shell's equipment retrieval operations, 31 Jul to 12 Sep 2013.

***Nordica* Vessel Status**	**Vessel Activity**			
	DP	**Idle**	**General**	***n***
Moving				
On-prospect	--	0	0	***0***
Off-prospect	--	0	2	***2***
Total	***--***	***0***	***2***	***2***
Stationary				
On-prospect	0	0	0	***0***
Off-prospect	0	0	0	***0***
Total	***0***	***0***	***0***	***0***