

**APPENDIX B**  
**BOEM's Marine Mammal Noise Criteria and Threshold Tables**

**Table 4-45. Non-Impulsive Thresholds and Criteria for Marine Mammals**

Group	Species	PTS Onset	TTS Onset	Behavioral Criteria
LF Cetaceans	Bowhead, Fin, Gray, Humpback, Minke	198 dB SEL (Type II weighted); 230 dB Peak SPL	178 dB SEL (Type II weighted); 224 dB Peak	Mysticete Dose Function (Type I)
MF Cetaceans	Beluga and Killer Whales	198 dB SEL (Type II weighted); 230 dB Peak SPL	178 dB SEL (Type II weighted); 224 dB Peak SPL	Odontocete Dose Function (Type I weighted)
HF Cetaceans	Harbor Porpoise	172 dB SEL (Type II weighted)	152 dB SEL (Type II weighted); 195 dB Peak SPL	120 dB SPL, unweighted
Phocidae (in water)	Bearded, Spotted, Ribbon, and Ringed Seals	197 dB SEL (Type I weighted); 235 dB Peak SPL	183 dB SEL (Type I weighted); 229 dB Peak SPL	Odontocete Dose Function (Type I weighted)

Source: Ciminello et al., 2012

**Table 4-46. Impulse Criteria and Thresholds for Marine Mammals**

Group	Species	Onset Mortality	Onset Slight Lung Injury	Onset Slight GI Tract Injury	Onset PTS	Onset TTS	Behavioral (for >2 pulses/2 4 hr)	Non-Explosive Impulsive Source (NMFS Level A)	Non-Explosive Impulsive Source (NMFS Level B)
LF Cetaceans	Bowhead, Fin, Gray, Humpback, Minke Whales	Note 1	Note 2	237 dB SPL (104 psi)	187 dB SEL (Type II weighted) or 230 dB Peak SPL	172 dB SEL (Type II weighted) or 224 dB Peak SPL	167 dB SEL (Type II weighted)	180 dB SPL KMS3	160 dB SPLRMS
MF Cetaceans	Beluga, Killer Whales				187 dB SEL (Type II weighted) or 230 dB Peak SPL	172 dB SEL (Type II weighted) or 224 dB Peak SPL	167 dB SEL (Type II weighted)	180 dB SPLRMS	160 dB SPLRMS
Group	Species	Onset Mortality	Onset Slight Lung Injury	Onset Slight GI Tract Injury	Onset PTS	Onset TTS	Behavioral (for >2 pulses/2 4 hr)	Non-Explosive Impulsive Source (NMFS Level A)	Non-Explosive Impulsive Source (NMFS Level B)
HF Cetaceans	Harbor Porpoises				161 dB SEL (Type II weighted) or 201 dB Peak SPL	146 dB SEL (Type II weighted) or 195 dB Peak SPL	141 dB SEL (Type II weighted)	180 dB SPL	160 dB SPL
Phocidae (in water)	Bearded, Spotted, Ribbon, Ringed Seals				192 dB SEL (Type I weighted) or 218 dB Peak SPL	177 dB SEL (Type I weighted) or 212 dB Peak SPL	172 dB SEL (Type I weighted)	190 dB SPLRMS	160 dB SPLRMS
Obodenidae Water	Pacific Walruses				215 dB SEL (Type I weighted) or 218 dB Peak SPL	200 dB SEL (Type I weighted) or 212 dB Peak SPL	195 dB SEL (Type I weighted)	190 dB SPLRMS	160 dB SPLRMS
Ursidae Water	Polar Bears				215 dB SEL (Type I weighted) or 218 dB Peak SPL	200 dB SEL (Type I weighted) or 212 dB Peak SPL	195 dB SEL (Type I weighted)	190 dB SPLRMS	160 dB SPLRMS

Notes: Note 1: =  $91.4M^{1/3}(1+[DRM/10.081])^{1/2}$  Pa-sec, where M = mass of animals in kg and DRM = depth of receiver (animal) in meters.

Note 2: =  $39.1M^{1/3}(1+[DRM/10.081])^{1/2}$  Pa-sec, where M=mass of animals in kg and DRM = depth of receiver (animal) in meters. Note 3: RMS refers to 90% of the energy under the envelope, per NMFS OPR. Source: adapted from Ciminello et al., 2012