

Dear Sir/Madam

The general approach of the scoping document is a welcome approach to the Environmental Assessment.

Soft starts or ramp-up of seismic surveys are standard practice, but typically this ramp-up will include the use of spare guns and will increase the number of guns incrementally one by one, resulting in a dB increase towards the end of the soft start of a fraction of a decibel which is not perceptible to human and probably not to mammal hearing either. As a result In Sakhalin in Russia the IUCN has been involved in guidelines which require soft starts to be in 6 dB steps of 5 minutes each. See :
https://www.iucn.org/sites/dev/files/wgwap_mmp_2018.pdf

Such soft starts need to be performed, typically, manually due to the limitations of gun control software and must be recorded to ensure compliance. The Environmental Assessment should include gun modelling of soft start and single gun testing.

The extra protection for beaked whales is welcome but please view the protection such vulnerable species are accorded in the Mediterranean at
http://www.accobams.org/new_accobams/wp-content/uploads/2018/09/GL_impact_anthropogenic_noise.pdf . Here a shutdown is required whenever beaked whales are seen due to their dangerous reactions to noise which are well documented. It has to be added that sightings of beaked whales during seismic surveys are generally rare. In part due to lack of observer familiarity with these animals and use of observers and acousticians familiar with beaked whales would be worthwhile. Additionally a two hour prewatch is required for deep diving or sensitive species under the ACCOBAMS protocols for the Mediterranean, with dive times of up to 2 hours and 17 minutes recorded for Cuviers beaked whales this doesn't seem unreasonable.

The Safety zone should clearly include Temporary threshold shift (TTS) as an injury as this is not always the case. The progression of TTS to PTS (Permanent Threshold Shift) is dependent on received levels of sound and the duration of time spent in proximity to the source. These can only be assumed in environmental assessment and consideration should be allowed for when assumptions are wrong.

Consideration should also be given to peak feeding locations and times and these should be avoided as seems to be intended. However these are not always known or fixed temporally or spatially. Therefore the mammals should be allowed to feed and rest undisturbed and this may necessitate further shutdown considerations.

The environmental assessment should clearly prohibit shooting in certain areas (for example "The Gully") and should limit acquisition to declared lines and testing and soft starts to an area of operations.

Compliance should be checked by competent personnel familiar with mitigation with datasheets provided throughout surveys regularly either by rotation or weekly to ensure any mistakes, errors or oversights are prevented from continuing throughout the survey.

These are just a few comments which I hope you may find helpful.

Yours faithfully
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