Habitat Management Division
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Your file Votre référence

Our file Notre référence

December 11, 2002

Mr. R. Petrie
District Manager - Yarmouth
Department of Environment and Labour
13 First Street
Yarmouth NS
B5A 2S9

Dear Mr. Petrie:

Fisheries and Oceans, Canada, Habitat Management Division (DFO-HMD) has reviewed the Whites Cove Blasting Plan submitted by Nova Stone Exporters Inc. dated November 18, 2002.

The information provided is inadequate to give DFO-HMD a sufficient level of confidence that fish, marine mammals, and fish habitat will be adequately protected from the effects of blasting operations at the Whites Cove quarry.

It is important the proponent understands that the mathematical formulas in the Blasting Guidelines are not designed to give extremely high precision to calculated criteria, but rather provide the framework for a more detailed analysis. For instance, the exact location of the shot site in relation to the water column is not considered. This fact needs to be addressed and makes it all the more important that the proponent ensures a conservative approach with adequate mitigation of the effects of the blast and monitoring to ensure that the mitigation is effective.

It was not possible to ascertain from the documentation submitted if the blasting plan is relevant to the initial blast only (which is described in some detail), or is to be considered a blanket document covering all aspects of subsequent blasting operations at the quarry. Some portions of the plan seem to indicate it applies only to the initial blast; other portions give the impression it is to be considered a blanket plan. DFO-HMD requires clarification of the intent prior to completing our review.

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More specific comments on the blasting plan are contained in the table following. Once the requested information is received, DFO-HMD will re-consider the blasting plan in light of all the additional information.

Sincerely,

James Ross
Section Head
Habitat Management Division

Attachment

cc: T. Wheaton

Fisheries and Oceans, Canada, Habitat Management Division (DFO-HMD) specific review of the Whites Cove Blasting Plan submitted by Nova Stone Exporters Inc., dated November 18, 2002.

Area of concern	Specifics of DFO's concern	Need for information
seal colony	What is the potential for disruption or harm to the seal colony identified in the report at Crowells Cove?	How far is the colony from the blast site? What species were present? What is the seasonal nature of the blasting? Is blasting to be concentrated in time or to occur throughout the year? What mitigation will be in place to protect the colony? What monitoring will be implemented to ensure the mitigation is effective? *Blasting may have to be restricted in specific months, seasons, depending on specific species present. For instance, if there were a harbour seal breeding colony, blasting may need to be restricted during May and June.* *There is evidence that seals are present to some degree year round adjacent to the site.*
ammonium nitrate-fuel oil (ANFO)	The main explosive to be used is ANFO. The [blasting guidelines} state that ANFO explosives are not to be used in or near water.	What mitigation will be in place to protect against ANFO entering the water? What monitoring will be implemented to ensure the mitigation is effective? Where does surface runoff go?
Timing of multiple delays	The time delay of multiple explosive charges should be greater than 25 ms (Guidelines p. 9). The blasting plan delay specifies exactly 25 ms between adjacent shot holes (blasting plan Fig. 2) but more than one line of shot holes are detonated simultaneously. This amounts to a total of 57 shots over 660 ms or an average time delay of only 11.8 ms. One pair of shots are only, in theory, 1 ms apart (367 and 368 ms delays	How will this effect be avoided, or what mitigation will be in place to protect against these effects? What monitoring will be implemented to ensure the mitigation is effective?

	respectively). This is sufficiently close to cause addition (approximate doubling) or "beaming" of excess acoustic pressures in particular directions. For a spherically spreading pressure wave this would approximately double the range for a given pressure effect compared to a single isolated detonation.	
35.6m setback	While the 35.6 m set back criterion (ignoring "beaming" effects above) for the approximate shot weight appears to be met for both the initial detonation site and for the projected region of the quarry. The setback distance for the 13 mm/s maximum ground velocity criterion for spawning habitat, is about 101 m (using a 45 kg charge and interpolating using a square root dependence on charge size and the data from Guidelines Table 2) and appears not to be met by the proposed initial blast site using the high water mark located 80 – 85 m distant. The intertidal and subtidal zone in this area is utilized by lobster, scallop, mussels, various species of groundfish, as well as pelagic species such as mackerel. Given the habitat features present and the level of commercial fishing success, it is expected that this area provides spawning, nursery, feeding, shelter and migration areas for the aquatic species noted.	DFO-HMD requires more detailed information to ascertain the impact of the blast(s) or redesign (such as widening of the setback) to ensure that negative impacts will not occur to the se species.
Fly rock	Will fly-rock, potentially hazardous wild life, be generated by the blasting?	How far will fly rock travel? What is the danger to marine mammals? What mitigation will be in place to protect against these effects? What monitoring will be implemented to ensure the mitigation is effective?
Sub-lethal effects of blast	One should note that the 35.6 m set back criterion	It is likely there are swim-bladdered fish in

	is computed for a 100 kPa pressure pulse. Such a pulse has a high probability of lethal effects on swim bladdered fish, especially at shallow water depths. Sub-lethal effects are not considered. This is a very severe criterion, and the report has not considered this. As mentioned previously, the intertidal and subtidal zone in this area is utilized by lobster, scallop, mussels, various species of groundfish, as well as pelagic species such as mackerel. Given the habitat features present and the level of commercial fishing success, it is expected that this area provides spawning, nursery, feeding, shelter and migration areas for the aquatic species noted.	proximity to the site. What mitigation will be in place to protect against these effects? What monitoring will be implemented to ensure the mitigation is effective?
Effects of sound and vibration	No mention is made of the projected frequency of future blasting (one per day – once per week – sporadic, on demand?). Some quarry operations are both noisy and of a more or less continuous nature such as drilling shot holes. Have these aspects been assessed? They could have a bearing on the effects to nearby colonies of seabirds or marine mammals.	What levels of sound and vibration are anticipated in the waters adjacent to the blast site? What mitigation will be in place to protect against these effects? What monitoring will be implemented to ensure the mitigation is effective?
Blasting within 500m of a marine mammal	This criteria is contained in [blasting guidelines]	What mitigation will be in place to protect against this possibility? What monitoring will be implemented to ensure the mitigation is effective?