

# Memorandum

To: Ministry for the Environment

Date: 17 March 2014

From: Yoann Ladroit

Our Ref: MFE13305

Copy:

Subject: **Review of: Acoustic Assessment: Proposal to Leave the Remains of the MV Rena on Astrolabe Reef**

## Executive summary

The report assesses the impact of leaving the remains of the MV Rena on the Astrolabe reef. Its purpose is not in any way to evaluate any acoustic impact linked to the removal operations themselves.

The report describes briefly the removal operations as they have been or are being done, and provides the proposed conditions listed in the Proposal for Resource Consent, including monitoring of the state of the reef and the wreck in the future.

The report makes a distinction between three different noise origins, which are listed as follows:

1. Direct effect due to the remains of the wreck moving in the dynamic reef environment
2. Indirect effect due to commercial and recreational boats visiting the wreck once the Exclusion Zone is lifted
3. The effects of sonar used to survey the position of the wreck if required in the future

Based on acoustic measurements made on site and on threshold levels recognized by the international scientific community, the report describes the two first effects as negligible, and the last one as potentially significant or severe. Therefore, the report lists mitigations to be applied in case of monitoring of the reef and/or wreck state, and none for the direct and indirect effects of the presence of the wreck on the reef.

## 1 Report summary and review:

### 2 General

The report gives a good overview and presentation of the origin and impact of underwater noise on marine life to the best of the current knowledge, with good bibliographic references. It provides the reader a good understanding of what sort of impact on marine life can result from exposure to various levels of noise.

### 3 Noise source identification

Noise sources directly or indirectly linked to the presence of the wreck on the reef are identified and described in order to evaluate the acoustic effect on the environment. Those sources are distinguished as directly resulting from the presence of the wreck or not. Underwater noise produced by direct effect from the presence of the remains on the reef is described as due to the wreck moving on the seabed (with swell and currents). Above and under water noise produced indirectly comes from anthropogenic activities due to regular vessel movements around the reef, including both commercial and recreational (divers, recreational fishing). It is difficult to evaluate what sort of increase in anthropogenic activities the presence of the wreck will bring once the exclusion zone is lifted.

The last potential noise source is linked to the use of acoustic systems, either for monitoring the state of the wreck (sonars) or by commercial and recreational vessels ('fish finders' and 'depth-finders').

### 4 Noise measurements:

Acoustic level measurement levels were conducted on the reef area over a two-day period to get an idea of the ambient noise level. The analysis results are summarized in the Appendix D of the report. The results show that noise in the reef vicinity is dominated by sea state noise, with no possibility of determining propagation losses from the wreck 'creaking' in the swell or from the salvage activities ('broco' thermal cutting) that were being done at the same time as the survey. As stated by the report, this is indeed a good sign that the wreck is not acting as a strong underwater noise source. To account to the presence of recreational boats in the vicinity, an external vessel was also used.

The only reservation I have about the acoustic noise survey is that the acoustic measurements were obtained in very good sea state conditions. As stated in the report, this provides a favourable environment for noise measurement of bow salvage activities, but this also means that the wreck does not move as much as it could with a higher swell. However, it is still very likely that with a higher swell, the noise coming from the wreck would be lost in the sea state noise, especially in this shallow water environment, and with the wreck reduced in size.

A vibration survey on the reef could not be undertaken.

### 5 Resulting noise assessment and conclusion:

The resulting assessment in the report shows that it is unlikely that noise resulting from direct and indirect effects will significantly impact the reef ecosystem. This conclusion seems very reasonable given the discussion on sound levels provided in the report.

The report points out that the use of sonar in future monitoring of the wreck might create noise-related issues. These issues are well known, and the report provides a series of standard measures to be taken in the case of further surveys in the vicinity of the reef.

All of the above supports the report conclusion stating that the overall impact of the presence of the wreck on the reef will be less than minor, excluding potential use of sonar.

## 6 Review conclusion:

The report shows that a good scientific methodology was applied to get to the conclusion they obtained. All the references used to define the acoustic thresholds to evaluate the impact on marine life are references used throughout the world in this sort of survey. The noise measurements were conducted and analysed appropriately, and the methodology to get to the final conclusion is clear and reduces subjective interpretation (see Table 3 in the report).

Some more extensive discussion on the use of sonar for the purpose of further monitoring would have been useful, especially since the Proposal for which resource consent is sought includes the condition: "Monitoring of the state of the reef environment and the state of the wreck". But it seems that this might be examined further since the following condition in the Proposal is: "Review of monitoring conditions, including contingency for further monitoring if required". The methodology described for monitoring the wreck in the Appendix B of Volume One - Application for Resource Consent (MV Rena), Beca 2013, does not require the use of sonar in the future, but a visual survey instead. If this was to be changed, and a geographic survey had to be conducted, the impact would have to be assessed beforehand.

To conclude, the study presented in the report is certainly serious and based on a good scientific methodology which leads to the conclusion that the assessment of noise associated with the presence of the wreck on the reef has been undertaken appropriately.



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