

PROPOSAL TO ESTABLISH AND OPERATE A MARINE FARM FOR CULTIVATION OF “FOVEAUX STRAIT” OYSTERS

On three sites situated in the area between Horseshoe Bay and Bob’s Point, Stewart Island

Re: Application for renewal

ASSESSMENT OF NOISE

PURSUANT TO

Section 18.11 (Noise)

Of the Southland Regional Coastal Plan

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Southern Seafoods (through Richard Langdon) has asked me to comment on whether noise is likely to be a consenting issue in this application.

The Southland Regional Coastal Plan

Section 18.11 provides that:

IN ADDITION TO THE GENERAL INFORMATION REQUIRED BY SECTION 18.2, where the proposed activity involves the generation or emission of noise within the coastal marine area, the following information will be required:

- 1 an analysis of the anticipated level of noise;*
- 2 an analysis of background noise levels. A distinction needs to be made between natural noise and human induced noise;*
- 3 a description of the timing, frequency and duration of any noise emission.*

Section 18.2 clarifies the meaning of the word ‘effect’:

For the purpose of the following information requirements, the word “effect” shall have the meaning given to it by Section 3 of the Resource Management Act. Section 3 states: “In this Act, unless the context otherwise requires, the term “effect”... includes –

- (a) Any positive or adverse effect; and*
- (b) Any temporary or permanent effect; and*
- (c) Any past, present, or future effect; and (d)*

Any cumulative effect which arises over time or in combination with other effects - regardless of the scale, intensity, duration, or frequency of the effect, and also includes –

- (e) Any potential effect of high probability; and*
- (f) Any potential effect of low probability which has a high potential impact”*

Assessment

The noise generated by activity associated with the marine farms is likely to emanate from the boat servicing the farms. During these servicing operations, the principal source of noise will be the boat’s engine. It will normally be operating at or near idling speed but must be kept running to power the boat’s hydraulic and other auxiliary systems. There may be other noise incidental to operations on deck but from my observation of other marine farming operations, such noises are most likely to be intermittent, of short duration, and not intrusive.

The vessel that will be used to service the proposed marine farms is pictured (Fig 1). The vessel is of



Figure 1

steel construction, approx. 12 meters in length, and is powered by single GM diesel which exhausts through a silenced dry stack positioned behind the wheelhouse. I am familiar with this vessel as it was based in Thule for many years and used to service marine farms in Big Glory Bay. It is noticeably quieter than other vessels used to service the Big Glory farms.

It must be stressed that the vessel is unlikely to be operating at 'cruise' speed anywhere near the marine farms. There is a speed limit of 5 knots within 60 meters of a wharf, jetty, mooring, the shoreline or another boat (MAST).

The following noise assessment was undertaken by me on Wednesday 14 August between 1.00 p., and 1.30 pm

Position: I was standing on Horseshoe Bay wharf next the shed.

Instrument: Digitech Sound Level Meter QM1591

Weather conditions: Light southwesterly, some ripples on the sea surface. Wind <10 knots at site.

Ambient noise: The main source of ambient noise was a moderate surge washing around the wharf structure and against the nearby rocky shoreline. The ambient noise varied between 44 and 48 dBA.

The noise test: The vessel approached the wharf at normal operating speed and stopped alongside the wharf. I took a series of readings while this happened.

I observed:

1. That the noise of the vessel's engine was not discernible by ear until the vessel was positioned as shown in Fig 2



Figure 2

At about this point the vessel was about 100 meters from where I was standing on the wharf and the readings on my noise meter increased to 51 – 53 dBA.

When the vessel arrived alongside the wharf (about 20 meters from where I was standing) and was put into reverse gear to take way off her, my noise meter showed noise readings peaking briefly at 57 dBA.

At one stage during the assessment Stewart Island Flights' Britten Norman Islander passed overhead at an altitude of about 1000 ft, increasing overall noise levels to a maximum of 58 dBA.

CONCLUSIONS

Anticipated level of noise:

1. The vessel operates at all times well within the provisions of the Southland Regional Coastal Plan Rule 5.3.616 - Noise limits for ships in motion
2. Even when the vessel is operating at idle, working at the farm, noise likely to be experienced on shore or outside the immediate area of the farm will be less than 50 dBA and certainly less than 50dBA L10 (**L10** is the **noise** level exceeded for 10% of the time of the measurement duration)

Background noise levels:

Background noise levels in the Horseshoe Bay area are dominated by the noise of the natural environment. This varies from very quiet, with no wind and no sea condition, to very noisy during high wind events. My impression when I took the readings were that the background noise levels were raised by the noise created by the sea surge but were otherwise "normal quiet".

Sources of human-induced noise are:

1. Boats come and go regularly from the commercial fish processing facility at Horseshoe Bay wharf, at all times of the day and night.
2. Horseshoe Bay is under the flight path of aircraft landing at the Stewart Island airstrip. Over Horseshoe Bay they are approaching the 'base leg' of the approach to the strip in westerly conditions and normally flying at an altitude of about 1000 ft. Aircraft also pass over Horseshoe Bay on their return to Invercargill. There can be up to 20 or more aircraft movements at peak times per day.
3. Low traffic volumes on Horseshoe Bay Road

Timing, frequency and duration of any noise emission

Work on the marine farms may be up to 2 days per week in busy times but is currently around half a day per week."

The main source of noise will be the boat's engine, operating at idling speed, while powering the boat's hydraulic and auxiliary systems.

The "Inverse Square Law" effect will reduce the sound experienced with increasing distance from the boat. In terms of the **propagation** and **attenuation** of sound, the inverse square law is a principle in physics whereby a **point source** emits a sound wave uniformly in all directions (essentially spherically), where the intensity of the sound wave energy at any given point away from the source is diminished as a function of the total surface area of the sphere coincident with that point. According to the inverse square law, it can be shown that for each doubling of distance from a point source, the sound pressure level decreases by approximately 6 dB.

Applying the general principles of the Inverse Square Law, and starting with my 'peak reading' of 57dBA when the vessel was alongside the wharf, it is reasonable to conclude that the operation will be well within the parameters of Rule 5.3.414 of the Regional Coastal Plan - General noise limits.

CONCLISON SUMMARY:

In my opinion any noise effect or any cumulative noise effect arising from this application is likely to be less than minor or de minimus.

APPENDIX

FROM THE SOUTHLAND REGIONAL COASTAL PLAN:

Noise

Rule 5.3.414 - General noise limits

Excluding Rule 5.3.8, unless subject to other rules in this Plan, it is a permitted activity for any activity within the coastal marine area to generate noise provided that the following noise limits are not exceeded, at any point at the landward boundary of the coastal marine area:

- i between 7:00 a.m. and 10:00 p.m. the L10 shall not exceed 50 dBA;
 - ii between 10:00 p.m. and 7:00 a.m. the following day, the L10 noise level shall not exceed 40 dBA;
 - iii between 10:00 p.m. and 7:00 a.m. the following day, the Lmax noise level shall not exceed 70 dBA.
- Noise shall be measured and assessed in accordance with the provisions of NZS 6801:1991 "Measurement of Sound" and NZS 6802:1991 "Assessment of Environmental Sound".

This Rule shall not apply to:

- i the activities specified in Rules 5.3.5, 5.3.6, 5.3.7, 5.11.1, 9.1.3 and 16.3.4;
- ii noise generated by safety signals or warning devices reasonably required to ensure safety provided that the best practical option for limiting noise emission is applied; and,

iii noise generated by an emergency work arising from the need to protect personal safety, or to prevent loss or serious damage to property or the environment.

Explanation - Noise levels can adversely affect other users of the coastal marine area. By setting noise limits consistent with the guidelines for protection of the public health and amenity contained in NZS 6802:1991, the rule provides certainty to the extent that noise can occur. More stringent limits are required at night due to lower background sound level and the need to prevent sleep disturbance.

Rule 5.3.616 - Noise limits for ships in motion

Except as provided for in Rule 5.3.5, it is a permitted activity for ships in motion to emit noise provided that such noise does not exceed a sound exposure level of 90 dB(A) in any single drive by at any position beyond a line situated 25 metres back from the line of travel. Sound levels shall be measured in accordance with the provisions of NZS 6801:1991 "Measurement of Sound".

18.11 Noise IN ADDITION TO THE GENERAL INFORMATION REQUIRED BY SECTION 18.2, where the proposed activity involves the generation or emission of noise within the coastal marine area, the following information will be required:

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