Attention: Director –Industry, Key Sites and Social Projects.

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Environmental Assessment Pindimar Abalone Farm
_____Application MP 10 0006_____

Having an active interest in marine ecology, this submission expresses my objections to the proposed abalone farm on the following grounds:

1. **Potential and extensive damage to sensitive Posidonia australis and Zostera capriconi seagrass meadows and loss of host marine nursery for larvae and juvenile marine species associated with the entrenchment of four pipelines.**
2. **Potentially unsustainable bio-security against pathogen infection and consequences.**
3. **Default in application of Ecologically Sustainable Development (ESD) criteria.**

1. Posidonia australis/Zostera capricorni seagrass meadows –

The seagrasses Posidonia and Zostera are the most extensive seagrasses on the Pindimar South inter-tidal shoreline that are of vital importance for the marine health and productivity of the Port Stephens estuary. The seagrasses occupy the shallow inter-tidal estuary waters where it is proposed to install 540m of trenched polypropolene intake and discharge pipes to service the abalone farm with a daily 50 mega litres (20 Olympic-size swimming pools) of estuary water, which clearly demonstrates this land-based DA to be excessively and unsustainably marine dependent.

Marine nurseries: Seagrasses are flowering marine gardens of largely unappreciated sensitivity providing nursery for a diversity of marine species, their larvae and juveniles with shelter and protection from larger predators and requiring a duty of care and responsible custodianship from all including authorities, DA proponents, stakeholders and the public.

Seagrass ecosystems are among the most diverse and productive ecosystems in the world, in ecological and economic value they rival tropical rainforests and the richest farmlands.

They are a vital natural marine resource supporting near-shore food web relationships and because of this, marine habitat managers are increasingly protective of seagrasses due to their importance as nursery habitat for a vast range of marine species and their vulnerability to shoreline development. (Domico T, 2003).

Will Posidonia transplant? Proposals to transplant displaced Posidonia are unconvincing since it is known Posidonia is highly vulnerable to disturbance and is extremely slow to recover from human impacts. (Kirkman H, 1997).

According to a July 2012 DPI Factsheet on Posidonia australis, damaged plants cease to establish lateral rhizome runners and are very slow to recover, taking up to 50 years to close a gap of 1m following damage, being unlikely to re-establish to pre-development levels in the short to medium term.

Attempts to replant seagrasses in Australia haven't been successful. (Poiner and Connacher 1992) and (Kirkman H, 1992).

The entrenchment of extensive pipeline will cause excessive turbidity with sediment easily transported across the extensive Pindimar seagrass meadows causing retarded growth through loss of sunlight and endangering both health and life of the abundant micro-organisms, larvae and species these seagrasses currently host in an otherwise healthy environment.

Pipeline entrenchment incompatible: The potential for unacceptable long-term impacts on the Pindimar seagrasses can be rated as very high with pipeline entrenchment incompatible with both the ecological and economic values of these seagrass meadows.

Seagrass communities are critical for the long-term sustainability of the Port Stephens/Great Lakes Coastal Zones and indeed that of the nation's coastal zones. This is sufficient reason why seagrasses must be fully protected and generally never be tampered with to satisfy a perceived commercial need or objective.

Despite the extensive areas and diverse species of seagrasses in NSW and nationally, there have been significant losses of these communities. This has occurred through natural and anthropogenic events from which seagrass systems cannot readily recover. (KIrkman H, Seagrasses of Australia, CSIRO- 1997).

2. Disease and bio-security control of pathogens –

It is in disease and bio-security control that aquaculture so often fails the Precautionary Principle test with grave consequences arising from economic pressures and targets leading to over-stocking and excessive animal densities.

While the cause of the disastrous Abalone Viral Ganglioneuritis outbreak at Southern Ocean Mariculture Pty Ltd and the infection of wild abalone stocks on the southern Victorian coast is still unknown, it needs to be acknowledged that there is a known link between production targets, inadequate or relaxed bio-security and in which case there will always be serious consequences in abalone farming.

Though the herpes-type virus Ganglioneuritis has no presence on the NSW coast, the parasite Perkinsus has, but with no presence in farmed abalone. This demonstrates as the Environmental Assessment does, that a Bio-security and Disease Management Plan (BDMP) must be at the very nerve centre of any abalone farming proposal.

This would surely also involve a Perkinsus monitoring program on the near-by coastal presence of the parasite to determine its spread or decline.

The bio-security of the extensive pipeline and internal plumbing of the proposed farm will be crucial in the avoidance and prevention of nutrient and pathogen contamination and potential disease, as would the use of UV and Ozone treatment as proposed.

Elevated, understated cumulative nitrogen impacts: Quality management controls regarding discharge are crucial in nutrient/nitrogen disposal to the Port's waters. Released water, stated to likely contain a *'somewhat elevated concentration of nitrogen'* is also stated to be expected: *'in concentrations of 0.26 milligrams/litre '*.

The cumulative impacts of a daily combined 50 mega litres of marine water with nitrogen levels of 0.26 milligrams/litre, clearly indicates that indeed there will be considerably elevated concentrations of nitrogen returned to the Port's waters. The cumulative effects of this projected nitrogen discharge to the natural marine environment of 1000 kilograms annually, and when additional to stormwater (nitrogen) flows to the Port, is an unacceptable outcome.

It is also of concern that the Environmental Assessment understates the expected daily nitrogen output to the estuary and is silent on the obvious cumulative impacts this is likely to have on the marine environment including marine species. This must be addressed.

The same principles of avoidance, containment and prevention apply to the use of chemicals, the application of which requires strict adherence to protocols.

It's a case of drastically reducing nitrogen and other nutrient disposal to the Port or finding an alternative disposal and use of 50 mega litres of daily discharge.
Any objective scientific inquiry of the causes of the AV Ganglioneuritis outbreak on the Victorian coast should be of considerable interest and learning in what not to do, what to avoid and any alternatives to present practices. All of which should be illuminating and of service to abalone farming in its need to focus attention to that elusive objective of attaining sustainability in abalone aquaculture.

3. ESD – for integrated sustainability criteria -

The Ecologically Sustainable Development (ESD) principles including the Precautionary Principle as contained in NSW government regulation such as the Coastal Protection Act 1979; NSW Coastal Policy 1997; the Environmental Planning Policy (SEPP-71) and Coastal Protection (SEPP-71) and other numerous regulations, provide an inadequate guide for sustainable outcomes. What needs to be done by the proponents of this DA if it is within their capacity, is to extend and go far beyond the 'regulatory' ESD requirement for the simple reason that these requirements as presented, comprise a legal window-dressing for commercial primacy in the 'business as usual' model that effectively puts both economy and ecology in a degraded and downward spiral.
This is the debate we need to have if commercial development is to attain ecological sustainability and integrity by adapting for a proportionate balance of ESD principles as in the integrated application of economic, environmental and social criteria.

30 tonnes, 60 tonnes or 100 tonnes: The original 2006 Application had projected a 30 tonnes per year of abalone production. The current Application is for 60 tonnes a year. Abalone industry operators recommend 100 tonnes a year as the essential target if today's abalone farms are to attain commercial certainty and success.
This tells us that the 60 tonnes a year target being sought may not be commercially viable and expansion to a 100 tonne capability could be inevitable in the medium to long term.

My three main and associated objections: These and the deficient application of ESD criteria lead me to conclude that the Application should be refused. This is despite having a concern for the proponent seeking to establish an abalone farm amid so much escalated environmental and economic uncertainty and risk. Which of course, re-emphasises the scientific and strategic importance of the Precautionary Principle and what is yet to be achieved for abalone aquaculture's sustainability. At this time, the case for this DA remains unconvincing.

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