

5 June 2007

Gunns Limited Pulp Mill Project
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SUBMISSION TO THE ASSESSMENT OF GUNNS LTD BLEACHED KRAFT PULP MILL, BELL BAY TASMANIA (EPBC 2007/3385)

As highlighted in previous submissions by TFIC in response to the request for comments on the proposed bleached kraft pulp mill our principal concerns are in relation to the potential deleterious impacts on Bass Strait marine ecosystems that may result for the disposal of effluent from the pulp mill into Bass Strait.

Our concerns in relation to the disposal of effluent into Bass Strait draw upon reviews of documentation and reports prepared on behalf of Gunns Limited by a number of consultants principally Toxikos. These documents include material submitted by Gunns Limited under the original pulp mill assessment process conducted by the RPDC, additional material submitted in response to questions raised by the RPDC and the *Bell Bay Pulp Mill Project Preliminary Documentation*. The reviews were conducted by Ass. Prof. Barbara Nowak (2007) and Adjunct Prof. Andrew Wadsely.

The review conducted by Ass. Prof. Nowak of the *Marine Impact Assessment Bell Bay Pulp Mill Effluent* (Toxikos 2007) found that, in general the report while providing some new information specifically in relation to chlorate toxicity testing and hydrodynamic modelling was essentially a review of the literature and previous reports. Of concern is the lack of information on the proposed monitoring regime for toxic compounds contained in the effluent particularly given the considerable uncertainty regarding potential adverse impacts. There is also a lack of proposed action in the event of adverse impacts being detected. There remains a need for adequate baseline survey information and a need for details regarding potential enforcement agencies/trigger point protocols.

Also of concern is the propensity to assume that lack of information means there will be a lack of effect. The lack of information on the impacts of the pulp mill effluent on the temperate marine ecosystems in Australia has proven a barrier to providing a rigorous evaluation of the potential impacts. The evaluation conducted by Toxikos has been conducted with reference to the published literature. The literature predominately refers to studies of the toxicity and residue accumulation of pulp mill effluent from Northern Hemisphere freshwater ecosystems. In addition the pulp mills in the Northern Hemisphere are generally a quarter of the size of the proposed Bell Bay Pulp Mill. Even allowing for the claimed efficiencies in water usage the total effluent disposal from the Bell

Bay mill is likely to be much higher than that of other mills. These factors make the extrapolation of results extremely difficult and problematic (exhibiting exponential characteristics).

Our specific concerns in relation to the toxicity of the effluent and its impact on the marine environment are outlined as follows;

Effluent Composition

The information on the composition of the effluent (Gunns Limited 2007 p67) is based primarily on a desktop review and on limited testing of effluent from overseas pulp mills. Again there is great difficulty in reliably extrapolating the results to providing a meaningful understanding of the potential adverse impacts on the marine environment, including listed and threatened species and the Commonwealth marine area. Our understanding is that the composition of the effluent will change depending on the mix of species (trees) to be used in the pulping process. Again, this provides a barrier to providing an adequate assessment of the potential impacts.

Calculations used to estimate the Concentrations of Dioxins

We request clarification on how the estimates of dioxin accumulation in the marine environment were calculated. The Toxikos report which estimates concentrations of effluent is based on the US EPA 2005 protocol. A review of the calculation of pulp mill effluent concentration conducted by Adjunct Professor Wadsley suggests that key equations that form part of the calculation protocol were omitted in Toxikos's calculations. Specifically, the calculation of $C_{w_{tot}}$ total water body COPC concentration, including water column and bed sediment used by Toxikos Equation 13.6 omits to take into consideration the concentration of dioxins in the sediment or $C_{w_{ctot}}$ as calculated using Equation 5 – 45 of the Protocol.

We are lead to believe that the omission of this calculation will lead to a serious underestimation of the total dioxin concentration in the marine environment. Particularly given the accepted understanding of how dioxins are partitioned in the sediment and water column.

Effluent Dispersion and Accumulation

We are concerned that the hydrodynamic modelling used by Toxikos to evaluate the fate of the pulp mill effluent and dilution rates is inadequate. The modelling used only one month of ocean current data (April 10 to May 10) which fails to account wave, affecting dispersion and wind action affecting accumulation. There is also a considerable risk that such a limited data set provides an atypical picture of physical oceanographic process in the vicinity of the effluent outfall and adjacent waters. Such a limited time series cannot allow a rigorous modelling approach that will account for all weather conditions that may affect effluent dispersal.

As the effluent will be delivered into Bass Strait waters continuously would there not be additional concentration and accumulative effects. Some of the compounds present in the effluent are persistent with half lives of over a hundred years. We believe that because of these factors the results of the modelling have limited application and do not represent worst case scenarios. There appears to be a general over reliance on the use of set values in regard to concentration levels within the effluent which is unlikely to reflect the "real life" situation when the mill is operating. A more rigorous approach would see a range of concentrations evaluated. At a presentation to the Tasmanian Rock Lobster Fishermen's Association in Launceston 28 May 2007 a representative

from Gunn's Limited stated that estimates of the concentrations of toxins in the effluent were on the "low side".

As stated in the TFIC submission in relation to Referral 2007/3385 the adequacy of the hydrodynamic modelling undertaken by GHD (Fryar 2007) has been queried by at least three scientists with considerable expertise in hydrodynamic modelling Drs. Godfrey, Cresswell and Sandery.

Ass. Prof. Nowak's review highlighted the potential impact on larvae of commercially important fish and invertebrates due to the effluents buoyancy which may result in a significant concentration of effluent in the upper layers of the water column where larvae are present.

Toxicity Testing

The adequacy of the toxicity tests used to evaluate the toxicity of pulp mill effluent sourced from mills in Thailand and South America is of concern. Although a wide range of tests were conducted they were all short-term tests and there is no evidence from the material supplied by Gunns that long-term tests or tests evaluating life-cycle of marine mammals have been carried out. Ass. Prof. Nowak suggests it would be more appropriate to run subchronic trials on a suite of marine organisms that more accurately reflect the time scale over which the effluent is released. 96 hour testing does not meet these criteria. Further Ass Prof. Nowak states that the effects of effluent on wild fish populations cannot be extrapolated from short term toxicity tests.

Choice of Effluents for Toxicity Testing

Given the lack of information regarding the chemical analysis of the effluent used in the exposure tests it is impossible to compare the effluents with information provided on the chemical composition of the effluent from the proposed pulp mill. Particularly, as stated the composition of the effluent is likely to change overtime as changes are made to the pulping process and the mix of species utilised in the pulping process.

Exposure Time and Toxicity

Although acknowledging the significance of exposure time in determining toxicity (Toxikos, 2007, page 45). This variable is not taken into account later in the report (e.g. Toxikos 2007, page 46).

Compliance with Water Quality Standards

The preliminary documentation (Gunns 2007, page 78) makes reference to the calculation of interim water quality trigger values using the process contained in the ANZECC & ARMCANZ guidelines. The testing was conducted on single species. The guidelines (ANZECC 2000) state that "[T]he preferred data for deriving trigger values come from multi species toxicity tests i.e. field or ecosystem models ecosystem (mesocosm) tests that represent the complex interactions of species in the field". It is acknowledged that there is a paucity of data available to meet screening requirements, for this reason the calculations for trigger values as used by Gunns Limited can only provide a *moderately reliable* guideline trigger value. Is a moderately reliable trigger value acceptable?

Integrated Chlorine Dioxide Plant

Although the plant employs new technology Becca AMEC Limited (Becca AMEC Ltd, 2006) has concluded it is not Accepted Modern Technology (AMT). As such safeguards are required to ensure excess chlorine gas contamination of the chlorine dioxide bleach is not inadvertently allowed to occur. Contamination of the chlorine dioxide bleach is the principal source of dioxins in the effluent.

We are unable to find information in the Preliminary Documentation and other documentation supplied by Gunns that detail what systems are in place to ensure this does not occur. Is there to be continuous monitoring of chlorine gas levels in the plant, and are there procedures in place that will cause excess gas to bypass the bleaching process or to be recirculated back through the system for cleaning?

Monitoring Regimes

There continues to be a paucity of information on the monitoring regime that will monitor the volume of effluent and the concentration of toxic compounds within the effluent from the mill. Will the monitoring regime analyse the lipid contents of biological samples so the residues of lipophilic compounds can be interpreted correctly. This is an issue for human health where the consumption of fish from areas adjacent to the effluent outfall may become of concern. In addition, will there be ecological surveys and toxicity screening? As residue testing will not provide all the necessary information.

One of the main requirements is that the monitoring should be conducted on a continuous basis. We are not sure if this is to be a regulated requirement.

Potential Impacts on Tamar River Aquaculture Operations

Although under the EPBC assessment criteria Gunns Limited may not be required to comment on the impacts on aquaculture activities in the Tamar River we are extremely concerned about potential negative impacts. As the effluent discharge is some distance from the outfall it is more likely that impacts would arise from dredging operations associated with the construction of a new wharf. Some areas of the Tamar River contain sediments that are highly toxic (Mondon 2000). The dredging activity may release these toxicants from the sediment into the water column. There is also potential for the release of toxic substances through leaching from landfills, incidental spills of discharges into the Tamar River or aerial drift contaminants. Ass. Prof. Nowak states that any effects on farmed animals are more likely to be sub-lethal than mass mortalities and are likely to occur over the long-term. There maybe human health considerations if there is an increase of toxins in the river.

Submitted on behalf of the Tasmanian seafood industry

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CHIEF EXECUTIVE

References:

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