

## Summary of Bell Bay Pulp Mill Environmental Monitoring Regime

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The Bell Bay Pulp Mill has put in place an appropriately stringent and comprehensive monitoring regime that responds to stringent regulatory and community concerns about the mill's safety.

The program is comprehensive in its breadth and detail, spanning air, land and water environments, and running to almost 400 pages of guidance documents.

The pulp mill project operates under both Commonwealth and Tasmanian regulatory regimes, and each has its own detailed monitoring requirements.

The Commonwealth Baseline and Operational Monitoring Program (C-BOMP) predominately addresses issues of Commonwealth concern in accordance with the *Environment Protection and Biodiversity Conservation Act, 1997*, namely:

- Listed threatened species and communities
- Listed migratory species, and
- Commonwealth marine areas.

The State Baseline and Operational Monitoring Program (S-BOMP) responds to the Tasmanian Government's requirements for environmental monitoring in accordance with the *Pulp Mill Assessment Act, 2007* and the normal Tasmanian environmental regulatory regime. A wide range of environmental factors will be monitored under the S-BOMP. These include:

- Chemical and particulate air quality
- Odour
- Noise
- Ground and surface water
- Soil quality
- Marine water quality, and
- Marine sediment.
- Marine ecological communities

The S-BOMP also includes an extensive "sentinel program" involving testing for chemical compounds in living organisms and/or human-consumed products including mussels, Little Penguins, fish (flathead & leatherjacket), and cows milk. The other strand of monitoring activity is termed "effects monitoring" and examines the diversity and abundance of marine species over time near and distant to the outfall.



The monitoring program is designed to be adaptive, so that information gathered through the program can be used to improve the focus and effectiveness of the program in achieving environmental protection. Any proposed changes to the C-BOMP or S-BOMP will require Commonwealth and/or State Government approval following technical review.

The monitoring program will be conducted by specialist consultants as well as appropriately trained Gunns employees. Laboratory analyses will be undertaken through laboratories certified by the National Association of Testing Authorities (NATA).

Reporting requirements for the monitoring program are extensive and are detailed in the S-BOMP and C-BOMP. Monitoring reports will be made available to the public through the project website and community engagement forums.

While there is significant overlap between the monitoring required for State and Commonwealth jurisdictions, the plans for each jurisdiction have been developed as separate documents at the request of the regulators. The C-BOMP is available on-line at [www.gunnspulpmill.com.au](http://www.gunnspulpmill.com.au). The S-BOMP (which describes the same monitoring activities along with many more individual sub-programs) will be published after its final approval by Tasmanian regulators.

### **An example: Monitoring the health of Little Penguins**

Little Penguins will be included as “sentinel” animals in the pulp mill monitoring program. Because they sit near the top of the food chain, Little Penguins are good indicators of the level of “persistent organic pollutants” (POPs) in the environment.

The most important POPs that need to be monitored to ensure the pulp mill is operating safely are from the “dioxin” and “furan” group of compounds, since these build up in the food chain and reach highest concentrations in predatory species, such as penguins where they occur in highest concentrations in fatty tissues.

A breeding colony of around 2,000 Little Penguins is located at Low Head, approximately nine kilometres from the proposed outfall site.

Penguins forage widely for food, from short trips often less than 20 km during the breeding season to 200 km or more outside the breeding season. As the Low Head colony are known to forage in the Tamar River estuary, which has higher levels of POPs than Bass Strait, a reference population from King Island, far removed from the pulp mill, has been included in the monitoring program.

The Little Penguin monitoring program includes:

- Sampling of one egg from each of 30 artificial burrows installed for the purpose at the Low Head colony during the breeding season
- Analysis of 42 chemical parameters for these eggs (covering dioxins, furans and dioxin-like PCBs), and
- Opportunistic sampling of dead penguins encountered during monitoring, and storage of carcasses for at least years to allow follow-up testing if required.

Baseline data from before the pulp mill is commissioned will be collected over two years from the Low Head and King Island populations.

The sentinel monitoring program will begin two years after the pulp mill begins operating as it is unlikely that bioaccumulation of POPs can occur in a lesser timeframe.

The results of the Little Penguin monitoring program will be released publicly with the annual Environmental Performance Report.

## Overview of Bell Bay Pulp Mill Environmental Monitoring Program

Atmospheric	Effluent & Marine
<p>Five <b>Air Quality Monitoring Stations</b> (AQMS) located near the mill site within the Tamar Valley will continuously monitor weather conditions, odours and airborne particles. Other air pollutants will be continuously monitored at one AQMS.</p>	<p><b>Mill Effluent</b> will be continuously monitored for volume and a number of key pollutants using on-line instruments at the wastewater treatment plant outlet.</p>
<p><b>Continuous Emission Monitors</b> (CEMS) will measure pollutant emissions as they exit the mill stacks, including using web-cams to maintain visual surveillance of emission points.</p>	<p><b>Mill Effluent</b> will be monitored via discrete periodic sampling at the wastewater treatment plant outlet for a range of pollutants via laboratory analysis. Sampling will occur every day, week or month depending on the pollutant to be measured. Chemical analysis will be undertaken by NATA-certified laboratories (or equivalent).</p>
<p>A <b>Real Time Dispersion Model</b> will continuously track and model emissions, predicting the location of emission plumes within the atmosphere. The model will use data obtained from the AQMS network and the CEMS, allowing the mill to be managed to optimise dispersion of emissions. This will also allow rapid investigation of any complaints. The model will use a temperature profiler device to detect atmospheric inversion layer(s), keeping mill management well informed about dispersion conditions.</p>	<p><b>Marine Ecological Effects Monitoring</b> will take place in Bass Strait in the area surrounding the outfall and beyond, to identify any effect (change) on the diversity or abundance of local marine flora and fauna. Focus areas will include benthic infauna (animals that live in the sand) and benthic epiflora and epifauna (animals and plants that attach to reefs). Specialist marine ecologists will undertake this component in accordance with a highly detailed assessment and analytical protocol developed specifically by the Commonwealth for pulp mill marine outfall monitoring.</p>
<p>A series of <b>Odourous Compound Monitoring Programs</b> will be in place to identify and or manage any odours. These programs include community-based odour surveys and an odour panel consisting of nearby residents. Chemical sampling methods will also be used to identify any fugitive emission points or the presence of odorous chemicals.</p>	<p>Baseline monitoring of <b>marine water quality</b> has been completed. After operations commence, frequent sampling will occur initially and then reduce to lower intensity. Chemical, physical and optical properties of the water will be examined and reported. Monitoring will be in accordance with Australian Guidelines for Marine Water Quality Monitoring.</p>

<p>A series of <b>discrete sampling programs</b> will be undertaken to demonstrate 'before and after' comparisons of a number of pollutants that are of concern to various stakeholder groups. These programs include measuring 'dioxins' in Cows milk and air as well as the concentration and chemical composition of PM2.5 particulates. Most sub-programs will be undertaken on a monthly or quarterly sampling regime.</p>	<p><b>Marine Sediment</b> sampling will occur at high frequency in Bass Strait in order to identify any changes in chemical and physical composition of sediments at several sites near and distant to the outfall. Two annual surveys will characterise baseline conditions before operations commence. Several sample runs per year at the same sites will examine post-operational trends. Purpose built sampling equipment will be used to focus analysis on the top 20mm of sediment. Chemical analysis will include persistent organic pollutants, such as 'dioxins' and resin acids and many other parameters</p>
<p>A network of <b>Noise Monitoring Stations</b> will continuously log noise data on the mill site and in the nearby Rowella area. Seasonal attended surveys will also be carried out at a number of noise sensitive and representative locations in the Rowella area.</p>	<p>The <b>Marine Sentinels Program</b> involves examining tissue concentrations of a range of pollutants in shellfish, fish and penguin eggs. Additional analysis will examine many of the same animals for possible 'effects' such as their general condition, growth rates and reproductive ability. Several surveys will be undertaken before operations commence and will be repeated after commencement.</p>
<p><b>Estuarine</b></p>	
<p>Surveillance of <b>construction impacts</b> due to installation of mill infrastructure (wharf and pipeline) within the River Tamar including underwater noise to protect sensitive species.</p>	
<p><b>Terrestrial</b></p>	
<p><b>Mill site</b> soils, groundwater and surface waters will be monitored, providing surveillance of the management and security of mill process materials. A monthly sampling regime will be undertaken initially.</p>	<p>An <b>infrastructure program</b> provides surveillance of threatened or sensitive species that may be a component of local habitats adjacent to mill infrastructure such as the pipeline route.</p>
<p><b>Reporting</b></p>	
<p>Substantial public reporting of all monitoring must be presented annually to State and Commonwealth regulators and published for all stakeholders to review. Independent environmental auditing will be undertaken for the Commonwealth in addition to routine oversight of the project (including monitoring activities) by the Independent Site Supervisor and Independent Expert Group.</p>	