DNV Certification Pty Ltd
ENVIRONMENTAL MANAGEMENT ISO14001:2004

Gunns LIMITED
ABN 29 009 478 148

2008 Public Environmental Report

Hampshire
Woodchip Mill

AUSTRALIAN FORESTRY STANDARD AFS/01-31-01
PEFC PEFC/21-31-01
Promoting Sustainable Forest Management

TABLE OF CONTENTS

APPENDICES

TABLE OF TABLES

TABLE OF FIGURES

1 Company Profile

Gunns Limited is Australia's largest fully integrated hardwood forest products company. It owns 246,000 hectares of freehold land in Tasmania, and manages in excess of 195,000 hectares of hardwood and softwood plantations in Tasmania, South Australia, Victoria and New South Wales. The company employs in excess of 2,600 people in Australia, New Zealand and Japan, and has a turnover of approximately AUD $700 million.

Gunns was established in 1875 and has a 133 year history in the timber industry. Over recent years it has consolidated its position as Australia's leading fully integrated hardwood forestry company, with the acquisitions of:

- Carter Holt Harvey's New Zealand veneer operations in 1999;
- Boral's Tasmanian sawmills in 1999;
- Boral's plantation and forestry assets and export woodchip business in 2000;
- North Forest Products' plantation, nursery and export woodchip operations in 2001;
- Wesfarmers' jarrah sawmilling assets in WA in 2004; and
- Auspine Limited's plantations in Tasmania, South Australia and Victoria, together with its sawmilling operations in Tasmania and South Australia in 2008.

Gunns also acquired Tamar Ridge Estates (TRE) in 2003, and Rosevears Estate Winery in 2006.

Gunns Limited's operations now include:

- Auspine softwood operations: two softwood sawmills in South Australia, one softwood sawmill in Tasmania, one woodchip export port in Portland, Victoria and seedling nursery in Mt Gambier, South Australia. These sawmills produce kiln dried softwood timber for framing and decorative purposes, treated products for outdoor use, engineered timber products, as well as other value-added softwood products;
- five existing woodchip export mills and four deep water port facilities in Tasmania, exporting in excess of 4.5 million tonnes per annum to Asian markets produced from sawmilling residues and residual pulpwood from integrated harvesting operations. The ability to dispose of residues for this purpose is a responsible use of a resource and an effective means of adding greater value to the timber harvested from Tasmania's forests. If not used for this purpose these residues would be burnt as a waste product from sawmilling;
- five hardwood sawmilling operations in Tasmania and two in Western Australia. These sawmills produce seasoned framing timbers, rough sawn kiln dried hardwood and value-added hardwood products such as laminated beams, tongue and groove flooring, mosaic and block parquetry, mouldings and furniture components;
- one veneer mill in Tasmania, one in Western Australia and one in New Zealand, making Gunns the biggest producer of sliced veneer in Australasia;
- a veneered panels plant situated in Tasmania, further value-adding to Gunns' veneer products;
- Gunns Plantations Ltd, a wholly owned subsidiary of Gunns Limited, which offers investment in growing timber plantations to the public via the release of an annual prospectus for its Woodlot Projects. In addition to raising funding from the Prospectus, Gunns also establishes plantations in its own right (100% funded) and also in joint ventures with several of its major Japanese customers.
- well advanced plans to build a world scale pulp mill at Bell Bay in north eastern Tasmania;

- a world class nursery in Tasmania which can produce up to 18 million seedlings per annum for use in Gunns' and GPL's plantation operations, and is capable of producing up to 600,000 vine plants for its viticultural operations (Vine Industry Nursery Accreditation (VINA) certified);
- a research and development facility which is the only one of its kind owned by a supplier of woodchips in Australia. The facility has been awarded certification by the National Association of Technology Authority (NATA);
- an award winning cool climate winery, Tamar Ridge Estates (TRE), in the Tamar Valley, Tasmania together with Rosevears Estate Winery;
- wholesale timber outlets in most Australian capital cities;
- seven Gunns Mitre 10 hardware stores. These stores provide a complete range of builders and handyman supplies, timber, homewares and electrical goods;
- Hinman Wright and Manser - a Tasmanian based construction business; and
- the operation of a Tasmanian National Trust heritage listed property, Entally House.

Gunns Limited is and has always been committed to the best use of the available resource. It is totally against our operating philosophy to permit any timber product processed by this company to be marketed short of its full potential. Gunns export extensively to overseas markets selling a wide range of timber products and is well recognized worldwide.

2 Statement to the Director of Environmental Management

In fulfilment of environmental conditions attached to Environmental Protection Notice (EPN) No. 572/1 and EPN No. 327/3, and the requirements of the Environmental Management and Pollution Control (General Fees) Regulations 2007 - Annual Fee Remission Guidelines we present the information below, which covers the operations of Gunns Limited's Hampshire site.

In accordance with the Annual Fee Remission Guidelines this document will review the site environmental performance for the three year period prior to July 2008. The operational period referred to by this document therefore covers the three year period 1st July 2005 – 30th June 2008.

The purpose of this report is to:

1. Report progress made to achieving previously set targets and objectives documented in the prior environmental performance review;

2. Communicate site targets and objectives for the coming period;

3. Document the Hampshire mill's compliance to prescriptions made under the *Environmental Management and Pollution Control Act 1994* in relation to environmental monitoring conditions.

4. Demonstrate that the company is committed to conducting its operations in accordance with its Environmental and Sustainability Policy (Appendix I) and Environmental Management System.

5. Demonstrate that the company is committed to continual improvement in environmental management in line with its accreditation with the international standard ISO14001.

As the senior representative of the company, the attached document is a true and accurate statement of the compliance of Gunns Limited, Hampshire for the period of this report. The Company has not undertaken operations exceeding the production limits attached to its permits nor altered or changed the nature of its operations in an environmentally significant manner without prior approval of the Director.

_____

John Gay
Executive Chairman

3 Environmental Management System - ISO14001 Accreditation

3.1 Description

Gunns Limited operates an Environmental Management System (EMS) to ensure environmental issues are assessed and effectively managed. Gunns' EMS provides the systematic basis which facilitates our continued compliance to applicable legal requirements set by regulators as well as policy commitments set by the company.

Gunns' EMS was first certified to the International Standard ISO14001 in 1998.
A full re-certification audit was carried out in April 2007 by external auditors Det Norske Veritas (DNV). Additionally DNV conducted a surveillance audit on the Hampshire site in May 2008. The results of these external audits have demonstrated Gunns Limited's continued compliance with the ISO14001 standard.

Certification to ISO14001 provides assurance to all stakeholders that Gunns has robust business systems in place to develop and review environmental performance indicators, assess and control environmental risk, and target continuous improvement in environmental performance.

A copy of the Environmental Management System Certificate, which covers all of Gunns Limited processing sites, is included as Appendix III.

The Hampshire mill, due to its remote location and designed control systems has a low environmental risk profile.

Prior to the April 2007 audit the Hampshire Mill's ISO14001 system was audited and inspected in April 2006 also by DNV. Comment on environmental performance was made by the auditor, that all existing physical controls are effective, with minor housekeeping issues presenting the best opportunity for future improvement at the site. The auditor also recorded that maintenance and implementation of the EMS at Hampshire was an example of best practice within Gunns' processing sites.

During the April 2007 ISO14001 re-certification audit, comment on environmental performance was made by the auditor that all Gunns Ltd sites established very good improvements to environmental conditions and previous audit findings. A further comment was made that the waste water management system at Hampshire is well managed and maintained.

3.2 Summary of contents of audits

Summaries of findings from external audits conducted by DNV during the reporting period are listed in Tables 3.1 – 3.3 below.

3.2.1 Surveillance audit April 2006

Category of Finding	Description	Corrective Action (if required)
Note-worthy Effort	EMS of the site is well structured and implemented. In some aspects of the EMS (e.g. operational controls in place) it can be considered best practice based on the comparison of audited areas	N/A
Minor non-conformance	Some EMS documents not controlled.	SHE system reviewed including new system documentation. Specific training conducted for line managers on SHE system.
Minor non-conformance	The identification of legal & other requirements is only partially done. Legal is mainly related to the EPN's requirements and other requirements are almost not identified.	Full review of legal & other compliance conducted company wide. Legal & Other register updated.
Minor non-conformance	Site documentation (EMS) is partially implemented within the revised SHE management systems' documentation.	New SHE system and Policy & Procedures database introduced.
Minor non-conformance	Monitoring of aquatic fauna not linked to any identified aspect/impact.	Aspects & Impacts resister reviewed and updated accordingly.
Minor non-conformance	Non conformities raised during last internal audits not managed using non-conformities procedure.	NC system reviewed leading to expansion of details recorded in database. Staff retrained in use of the system.
Minor non-conformance	Competence of organisation's personnel is demonstrated through training records. However no record related to the awareness training is available.	Training records deemed adequate and this was accepted by auditor with no corrective action required.

Table 3.1: Surveillance audit findings April 2006

3.2.2 Recertification audit April 2007

Category of Finding	Description	Corrective Action (if required)
Note-worthy Effort	The EMS audit at Hampshire established very good improvements to environmental conditions and previous audit findings. All observations and nonconformity's were addressed and have been closed out.	N/A
Note-worthy Effort	The waste water management system at Hampshire is well managed and maintained.	N/A
Minor non-conformance	EPN 572/1 dated 9/5/01, specifies waste water discharge limits for Hampshire, but monitoring requirements have not been identified. - Procedure HSM-EP-0003, dated 10/1/06, refers to EPN 327/1, but EPN 572/1 is the current one. Also Site Mill Permit 5397 is not available on site.	Waste water (irrigation plot) discharge monitoring commenced July 2007. Procedure amended to refer to both current EPN's

Category of Finding	Description	Corrective Action (if required)
	- Identification of containers with hydrocarbons or chemicals is not always adequate, e.g. cordial bottle with coolant, mobile diesel tank without ID.	Containers and diesel tank re-labelled. Review of dangerous goods conducted.

Table 3.2: Re-certification audit findings April 2007

3.2.3 Surveillance audit May 2008

Category of Finding	Description	Corrective Action (if required)
Observation	Identification of containers with hydrocarbons or chemicals is not always adequate at Hampshire: In the DG store there was three instances of unlabelled DG's viewed e.g. mineral turpentine with oil in it and no alternate writing/label.	All unmarked containers removed from site. Checklist implemented for site Supervisor to perform weekly audits of storage locations. Site notice issued regarding site requirements for labelling of hazardous substances and chemicals.

Table 3.3: Surveillance audit findings May 2008

4 Australian Forestry Standard (AS4708) and Chain of Custody Standard (AS4707) accreditation

The Australian Standard AS4707, Chain of Custody for Certified Wood and Forest Products (hereafter abbreviated to CoC), is a standard that compliments the Australian Forestry Standard (AFS).

Gunns Limited obtained AFS certification (AS4708) in November 2003. The AFS ensures that Gunns approach to Sustainable Forest Management is ecologically, socially and economically sustainable and promotes continuous improvement in these areas. AFS certification is measured through compliance with the following overarching criteria (Figure 4.1):

Figure 4.1: AFS Criteria

In combination with Gunns Limited certification and the certification of our other major suppliers, the majority of wood products to Gunns Limited processing sites in Tasmania are now certified. Gunns Limited obtained CoC certification in November 2004. Implementation and certification of the CoC Standard allows Gunns Limited to provide its customers with certified product.

The CoC Standard (AS 4707) is an inventory control system that tracks a wood or forest product from its origin in a certified forest through to its end use by the consumer (covering all phases of ownership, transport, manufacture and sale). It allows the controlled labelling of wood products with the CoC logo, which is an important mechanism in independently communicating to our customers and their customers that the products being supplied are derived from legal and sustainably managed forests i.e. forests certified to the Australian Forestry Standard (AFS) – AS4708 or its equivalent.

To comply with the CoC Standard and enable labelling of our products Gunns Limited adheres to the following principles:

1. Management commitment to implement the CoC system;
2. Implementation of a documented control system;
3. Provision of personnel training and development;
4. Implementation of a recognition system for verification of origin;
5. Final inspection of product at the end of our certification chain;
6. Maintenance of all record keeping;
7. Implementation of controls over use of certificates;
8. Demonstration of continuous improvement.

The AFS is mutually recognised at the International level within the PEFC (Programme for Endorsement of Forest Certification schemes) framework. In addition to the AFS, this will allow the claims to be made on Gunns Limited wood products under PEFC where required.

Gunns is audited to the CoC Standard by international certification body Det Norske Veritas (DNV), who are accredited under Joint Accreditation Systems of Australia and New Zealand (JAS-ANZ).

DNV conducted the most recent audit of Deloraine's Chain of Custody system in November 2004. The next external audit of the Deloraine site is due in October 2008. DNV also conducted the most recent AFS audit of Gunns Limited's North West Tasmania operations in April 2007. Both these audits successfully demonstrated Gunns Limited's compliance with the relevant standards.

Copies of Gunns Limited's Chain of Custody Policy (Appendix II), Chain of Custody Management System Certificate (Appendix IV) and Australian Forestry Standard Forest Management System Certificate (Appendix V) are appended to this document.

5 Activity Profile – Hampshire Woodchip Mill

5.1 Plant & Operations

Gunns Limited operates a woodchip processing facility at Hampshire with 24-hour, seven-day week permitted operations. Contractual requirements, financial penalties and defined windows of business opportunity dictate the hours of operations in order to meet customer demands.

The mill is in an area zoned as Rural Forestry under the Burnie Planning Scheme 1989. The surrounding area is predominantly zoned Rural Forestry (see Figure 5.1). The nearest township is Hampshire which is approximately 4 kilometres North East of the mill site.

The Hampshire facility produces hardwood woodchips for export to the Asian market and local sales to domestic customer(s).

The site consists of the wood chipping mill, log and chip storage areas.

Logs are delivered to the mill via road transportation where they are unloaded directly into the process line or placed into storage for later processing. Once the logs have entered the wood chipping process, are chipped and screened to meet the required dimensional specifications. The final product is stored on open chip storage stockpiles in readiness for road transportation to either domestic customers or to the Gunns Limited export facility located at Burnie.

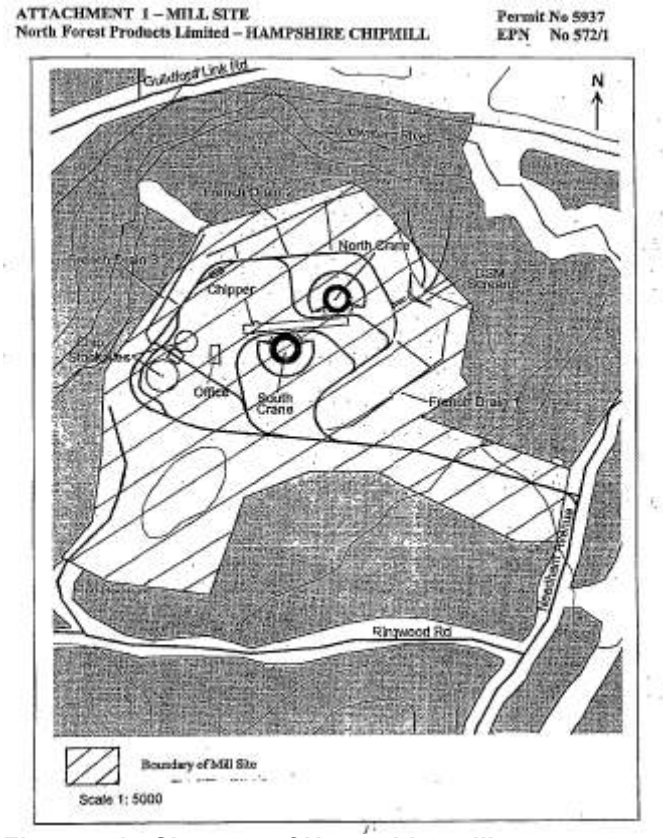

Figure 5.1: Site map of Hampshire mill

5.2 Production levels

Date	Log Input MT	Woodchips to stockpile MT	Capacity (as per EPN 572/1) MT
2005/06	887,071	850,706	1,600,000
2006/07	886,586	849,934	1,600,000
2007/08	897,721	864,329	1,600,000

Table 5.1: Production levels 2005/06 – 2007/08

5.3 Product market and sources of raw material

The Hampshire facility produces hardwood woodchips for export to the Asian market and local sales to domestic customer(s).

Overall the raw material in flow into the Hampshire mill can be categorised as one of two sources:

Native forests - from trees or parts of trees too defective to be economically processed as sawlogs, that are removed in the integrated sawlog-pulplog harvesting operations and from small trees thinned to promote the growth of bigger trees for sawlogs.

Pulpwood originating from harvesting operations is conducted under approved Forest Practices Plans consisting of both native forest and plantation wood. The multiple use forests which native forest timber is sourced are managed for wood production and less than 1% of these forests are harvested in any one-year. This small proportion is regenerated following harvesting so that a perpetual supply of native hardwood and softwood is available. The forests in conservation reserves are permanently reserved from logging.

and ***Plantation*** - originates from either the thinning or from the harvest of short rotation pulpwood (hardwood plantations).

5.4 Pollution discharges and wastes

The site has continued treatment of storm and process water before dispersal off site through the approved reuse and emission point and irrigation in surrounding plantation areas.

5.5 Pollution control measures

- All hydrocarbons are stored in bunded areas.
- All hazardous materials are stored in accordance with the Dangerous Goods Act / AS1940. All other materials in bulk form are stored in bunded areas.
- Any hazardous wastes are removed by licensed contractors.
- Storm and process water is treated before dispersal off site through the approved emission point and irrigation in surrounding plantation areas.
- Programs are in place for monitoring of aquatic fauna in the Loudwater River, as well as sampling and testing of groundwater.
- All incoming/outgoing woodchip or wood waste loads must have an effective cover or other means to prevent spillage and atmospheric emissions.
- There is no on-site burial of wastes.

5.6 The local environment

The Gunns Hampshire mill forms a part of Gunns Limited integrated forestry operations in Tasmania. The mill is located in an area zoned Rural Forestry, approximately thirty kilometres South of Burnie alongside the Ridgley Highway. Trees form a visual screen between the mill and the road. The Loudwater River runs along the North Western side of the mill site. The surrounding area is predominantly zoned Rural Forestry.
Figure 5.1 below shows zoning for the Hampshire area.

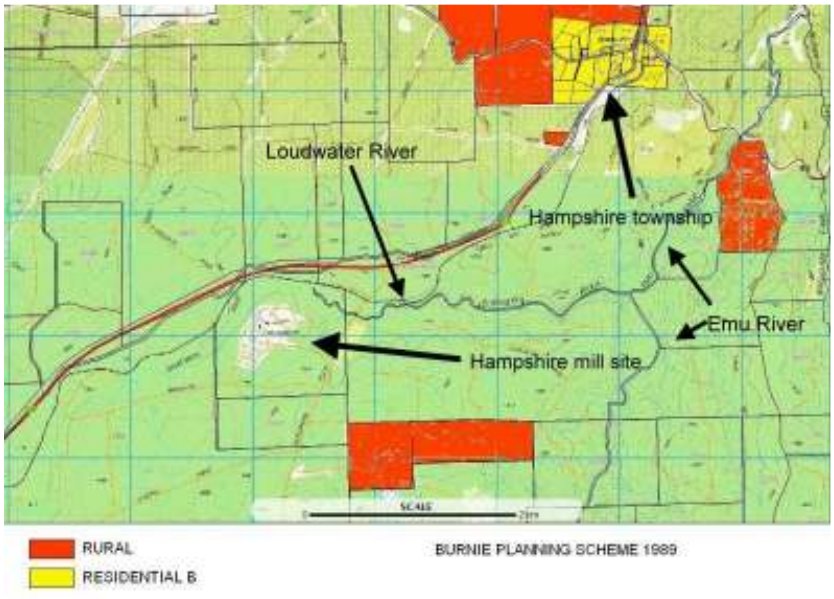

Figure 5.2: Hampshire zoning (Burnie Planning Scheme 1989)
Note: all areas shown other than Rural and Residential B zones, are zoned as Rural Forestry.

Process water is drawn from the Emu River located approximately 2.5kms to the South East. The mill is situated within the Gunns Limited Surrey Hills treefarm estate with much of the surrounding area either native forest or in plantation.

The nearest domestic residence is some 5kms to the North of the mill site located within the small rural community of Hampshire. The Kara Mine is located approximately 4.7kms to the East. The nearest school is at Ridgley, approximately 8kms to the North.

The wind direction is predominantly from the South West containing cool mountain air flows, periodic snow falls and average rain fall of approximately 1200mm.

5.7 Significant changes

There were no significant changes to any of the above areas for the reporting period.

Harvesting of mature *Pinus radiata* plantations surrounding the mill site is planned for the 2008/09 period.
The *P.radiata* plantations provide a staggered tier visual screen for the mill site and harvesting of the mature tier is planned given the growth of secondary tier *P.radiata* plantations.

5.8 Air emissions

Effective covers or other means are required for incoming/outgoing woodchip or wood waste cartage.

Woodchips are deposited on stockpiles via delivery chutes. There is no Jet Slinger operated stockpiling on site.
High moisture content of woodchips and relatively high rainfall assist in the reduction of process and commutable dust. Only small amounts of water sprays are required on site.
There is no boiler or waste burning on the site.

The mill environs and trafficable areas are maintained to reduce combustible materials build up and fugitive dust from vehicular traffic. Gunns owns and operates a street sweeper on site for this purpose.

The principle energy use on site is electricity with limited diesel equipment operation. Mobile plant gaseous emissions are confined to registered product delivery vehicles constructed to meet Australian vehicle exhaust emission requirements.

Hampshire mill based on its operations and location is a low impact operation.

5.9 Water emissions

The Hampshire mill utilises very limited water in its process operations. Small amounts of water are delivered to the process via "water spray" application for lubrication and dust suppression. Apart from providing services for the amenities buildings, the remaining water capacity is reserved for fire fighting systems.

There are three oil separation facilities located within the mill drainage system. Areas where hydrocarbons spillages may occur are bunded and runoff channelled via oil separation facilities. Oil separation facilities are serviced fortnightly or immediately following a spillage. Oil and residual water is collected and removed from the oil separation facilities by licensed contractors.

The mill site is surrounded by drainage systems to collect storm and process water runoff which is directed to a waste water treatment plant. The solid materials (primarily wood fibre residues) are removed from the waste water before dispersal off site through the approved reuse and emission point via irrigation systems in surrounding plantation areas. All site water is managed through this system.

Three sampling points have been established to collect any possible runoff water from the irrigation system. These points are monitored as "site discharge" in line with emission limits although there is no dedicated discharge point. Ground water sampling is undertaken to evaluate the effects of hydrogeological absorbsion from the irrigation process.

Emission limits as per EPN No. 572/1, Schedule 3 are as follows:

Substance	*Emission Limit Concentration*
Non Filterable Residue: Where lowest rate of flow of the receiving waters is less than or equal to 50 times the flow rate of the emission	30 mg/L
Non Filterable Residue: Where the lowest rate of flow of the receiving waters is at least 50 times greater than the flow rate of the emission	60 mg/L
Biochemical Oxygen Demand: Where lowest rate of flow of the receiving waters is less than or equal to 50 times the flow rate of the emission	20 mg/L
Biochemical Oxygen Demand: Where the lowest rate of flow of the receiving waters is at least 50 times greater than the flow rate of the emission	40 mg/L
Oil and Grease	10 mg/L
Faecal coliforms	200 per 100 ml

Table 5.2: EPN 572/1 emission limits

Aquatic Fauna surveys are undertaken on the adjacent Loudwater River to evaluate the effects of the mill operations in regard to river health. Monitoring results to date indicate that the irrigation practices do not adversely impact on the Loudwater River. Details of Loudwater River monitoring are shown in Section 5.15

5.10 Land/soil contamination

There is no known land or soil contamination on the site.
All oils and liquid wastes are bunded to prevent possible ground contamination.
Oil spill kits are located around the site for rapid response to spills.

5.11 Wastes – general waste and controlled waste

Gunns Limited has a "hierarchy of wastes" whereby waste products are re-used or recycled if at all possible.
There is no on site refuse burial. There is no waste burning on site.
Materials to be disposed of are sent to approved landfill or reuse options.

Waste Type	Destination	2005/06	2006/07	2007/08
Bark	Bark dump	10,924	2,201	0[#]
Bark	Reuse	6,107	10,060	10,136
Fines	Boiler Fuel	8,205	8,334	6,831

Table 5.3: Waste production 2005/06 – 2007/08
(note: wet/green weights).

[#] Bark previously sent to dump has been reused within mill environs for horticultural purposes and the formation of log stockpile bases. The material has not been transported off site via weighbridge and therefore volumes are unquantified.

Wood waste options currently being investigated include biomass production and commercial production of mulch for horticultural applications.

Waste generation rates for the coming year are not expected to significantly alter from the 2007/08 figures.

Oil Reconciliation Statement 2005/06 – 2007/08			
Oil	Amount		
	2005/06	2006/07	2007/08
Total Oil Purchased	10,420 Litres	5,608 Litres	14,690 Litres
Oil sent to recovery	2,100 Litres	1,700 Litres	3,600 Litres
Oil lost	0 Litres	0 Litres	0 Litres
% Oil sent to recovery	20.1 %	30.3 %	24.5 %

Table 5.4: Oil reconciliation statement 2005/06 – 2007/08

Note: Variation between quantities purchased and sent to recovery/lost is mainly due to normal burning and evaporation of oil in machinery.
Oil volumes collected from site bunds and oil interceptors are unquantifiable due to the quantity of water contained within the collection. Therefore, these collection volumes of oil are not included as oil sent to recovery.

5.12 Energy use

The Hampshire mill is metered through Aurora. The combined power demand is dependent on demand but is around 5,000,000 kWh per annum.

The principle energy use on site is electricity with limited diesel equipment operation. The energy source for both cranes is electricity. Mobile plant relies on diesel as its energy source. Other sources of site energy usage are negligible.

A program began at the Hampshire site in 2006/07 to reduce energy consumption.
Concentration of all processing through the South crane has enabled the North crane and associated plant and equipment to be reserved for emergency operations only.
Log delivery schedules have been implemented to reduce double handling of products.

A study of energy usage was conducted in 2006/07 to establish baseline energy usage data for the entire Gunns Limited organisation. Monitoring and reporting of energy usage was commenced in the 2007/08 financial year in line with the Energy Efficiency Opportunities Act 2006, with the intention of identifying opportunities for reducing energy consumption.

Based on this assessment, site energy usage for the past two years is listed in Table 5.5 below:

Year	Electricity (GJ)	Diesel(GJ)
2006/07	17,963	1,405
2007/08	18,260	1,335

Table 5.5: Energy consumption 2006/07 - 2007/08

5.13 Measures taken to minimise greenhouse emissions

A study of greenhouse gas emissions is to be conducted in 2008/09 to establish baseline greenhouse gas emissions for the entire organisation. Monitoring and reporting of greenhouse emissions is to be commenced in the 2008/09 financial year in line with the National Greenhouse and Energy Reporting Act 2007, with the intention of identifying opportunities for reducing greenhouse emissions.

5.14 Water use

Process water is irrigated into surrounding plantation areas, and the volumes listed in Table 5.6 below:

Year	Irrigation Volume (kL)
2005/06	82,426
2006/07	43,502
2007/08	56,608

Table 5.6: Irrigation volumes 2005/06 – 2007/08

Hampshire mill EPN 327/3 specifies a maximum water take from the Emu River of 2,880 kilolitres per 8 hour shift. Current water take is less than 40 kilolitres per 8 hour shift equivalent due to the decommissioning of on site log wash facilities.

5.15 Biodiversity

5.15.1 2005/06 Loudwater River study

A major component of Gunns Limited's environmental monitoring program to date has been the annual and biennial studies undertaken by Associate Professor Alastair Richardson of UTAS Consulting (University of Tasmania) of the constructed wetlands at Triabunna and the Loudwater River, adjacent to the Hampshire Chip Mill. The studies at Hampshire have used methodologies developed by Associate Professor Richardson et al over a number of years comparing faunal abundances among 3 sites (1 upstream and 2 downstream) from the mill and between years.

The study program to date on the Loudwater is a legacy of prior studies on the both Loudwater and the Cam Rivers. The original intent was to monitor the impact of water abstraction from the Cam and subsequent dispersion from log wash activities from the mill into the Loudwater catchment, via an irrigation system within a designated pine plantation area. Over recent years, log wash activities have ceased, with corresponding decrease in water dispersion to the plantation. Water use is now approximately 10% of the prior rate and the plantation dispersion area has also decreased in area by approximately 50% (partial harvest).

Also over recent years, AUSRIVAS (Australian River Assessment System) - a rapid prediction system used to assess the biological health of Australian rivers was developed under the National River Health Program (NRHP) by the Federal Government. Gunns Limited staff initiated a review of our aquatic program during 2005/6, to improve the efficacy of the entire program. Associate Professor Richardson was requested by Gunns to consider if, in his view, the AUSRIVAS technique would be a suitable method for ongoing monitoring of the mill on the Loudwater, as the AUSRIVAS format monitoring data and report would also have value within other Gunns and community water monitoring programs.

5.15.2 2006/07 Loudwater River Study - Report Summary

Three sites on the Loudwater River (at Ringwood Road, above the Hampshire woodchip mill; Guildford Road and Loudwater Road) were sampled in spring 2006 and autumn 2007, using the AUSRIVAS techniques in riffle and edge habitats.

The data were analysed using AUSRIVAS predictive models derived from Tasmania-wide sites, and using MDS ordination and analysis of similarities.

The analyses indicated a reduced diversity of freshwater invertebrates at Site 2 immediately below the mill, but this effect had disappeared at Site 3, about 1.5 kilometres downstream.

Overall, most (8 out of 12) collections from the Loudwater River sites showed some evidence of impact in the form of loss of expected families, compared to the AUSRIVAS predictions. This finding may have been influenced by persistent low water levels

The OE50 scores are plotted in Figure 5.2, which also shows the width of the "A" and "B" bands for each; note that the widths of the bands vary for each model (autumn/spring x edge/riffle).

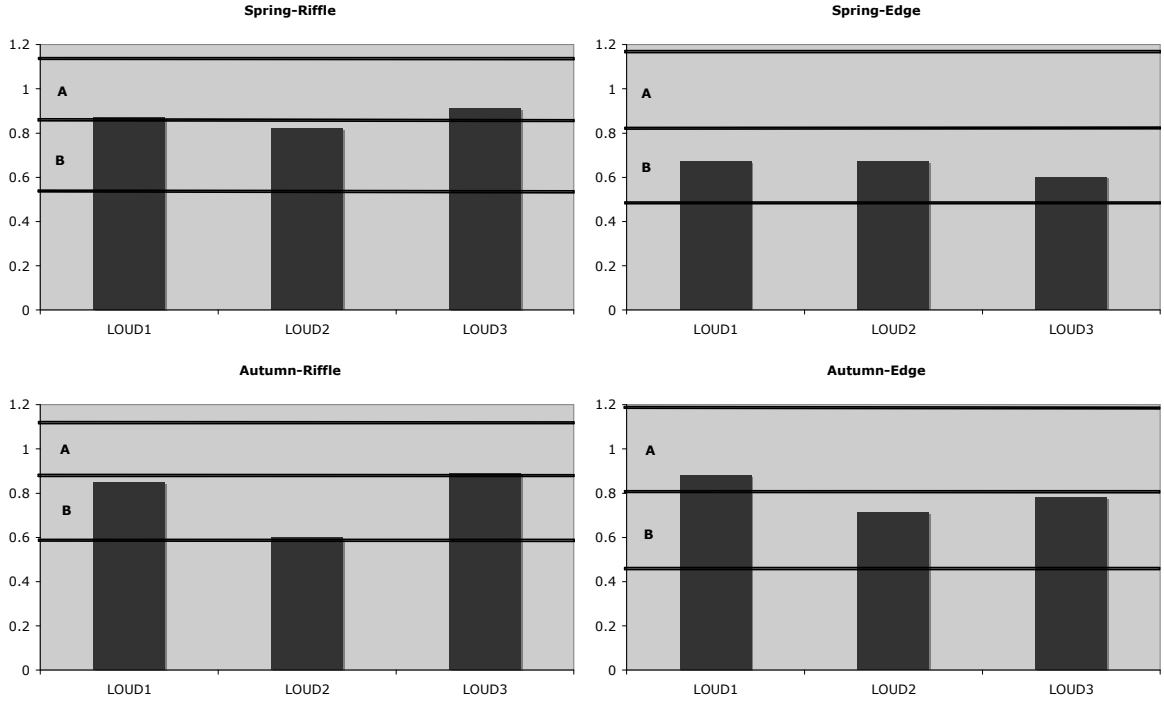

Figure 5.3: OE50 scores
(see text) for collections from each site and habitat on the Loudwater River in spring 2006 and autumn 2007. Horizontal lines indicate the boundaries of AUSRIVAS bands A and B (see text).

The riffle collections suggest a reduction in biodiversity at Site 2 in both seasons, but in both cases Site 3 has a higher OE50 score than the control Site 1. The same trend is seen in the autumn edge sample, while the spring edge sample suggests similar biodiversity at Sites 1 and 2 with a reduction at Site 3. Table 4 shows the differences between the number of taxa most strongly predicted to occur in each collection and the number actually observed; it also lists the taxa missing from Site 2.

5.15.2.1 2007 Study Conclusions

The AUSRIVAS approach is sensitive enough to detect differences between the Loudwater sites.
AUSRIVAS finds the same pattern (reduced diversity at Site 2) as the previous sampling strategy.
Low water levels may interfere with the assessment.
Local, north west Tasmania, AUSRIVAS models may give a better assessment of the health of streams in forestry catchments.

5.15.3 2007/08 Loudwater River study– Aquatic fauna

Gunns Limited has, with the approval of the Director of Environmental Management, implemented the AUSRIVAS methodology for the monitoring program for the Loudwater River. The AUSRIVAS program comprises of 3 monitoring site on the Loudwater River, sampled twice per year (spring & autumn).

5.15.3.1 2008 Report Summary

AUSRIVAS sampling and analysis has been completed over two seasons since the last AUSRIVAS report in June 2007. This report covers the surveys conducted in spring 2007 and autumn 2008.
Results this year indicate site specific factors to be the cause of low OE50 scores at Site 2 in previous years, rather than effects from irrigation.

5.15.3.2 Introduction

The upper catchments of the Loudwater River are managed for intensive tree farming by Gunns. The waste water from the Hampshire woodchip mill is used to irrigate plantations around Ringwood and Dudfield Roads.
This report deals with monitoring water quality by the AUSRIVAS method at a control site (Site 1), and two test sites (Sites 2 and Site 3) located in the area of irrigation and then further down stream respectively. Results are compared with previous surveys to Investigate reasons for trends.

5.15.3.3 Methods

The AUSRIVAS bioassessment involves collecting a “kick sample” from a 10 m section of stream in a riffle by holding a 250 µm net with a 280 x 340 mm opening downstream and vigorously moving the feet into the substrate to dislodge macroinvertebrates. An edge sample is also collected by sweeping the net around the edges of the river over a 10m length. The macroinvertebrates from each sample were picked out on site according to AUSRIVAS protocol. Various physical and chemical measurements were taken at each site along with a detailed aquatic and riparian habitat assessment.
The macroinvertebrates were identified in the laboratory under a binocular microscope to family level (some at a higher level). The data was entered into the AUSRIVAS macroinvertebrate predictive model for analysis producing various outputs (the main ones being OE50 and OE50Signal) see tables)). These indices can be directly compared with other streams in the region and previous year’s surveys.

5.15.3.4 Sampling Program

Two sampling runs were carried out in spring 2006 and autumn 2007 in a previous study and a further two sampling runs for the present report in spring 2007 and Autumn 2008.

The sampling site for Site 3, spring 2007, was located a short distance further downstream than for other samplings.

Site/Year	Season	Habitat	OE50	OE50Signal	Band
1(2006)	Spring	Edge	0.67	0.92	B
2(2006)	Spring	Edge	0.67	0.93	B
3(2006)	Spring	Edge	0.60	1.09	B
1(2006)	Spring	Riffle	0.87	0.95	A
2(2006)	Spring	Riffle	0.82	0.89	B
3(2006)	Spring	Riffle	0.91	0.99	A
1(2007)	Autumn	Edge	0.88	1.05	A
2(2007)	Autumn	Edge	0.71	0.95	B
3(2007)	Autumn	Edge	0.78	1.10	B
1(2007)	Autumn	Riffle	0.85	1.04	B
2(2007)	Autumn	Riffle	0.60	0.88	B
3(2007)	Autumn	Riffle	0.89	1.07	A
1(2007)	Spring	Edge	0.86	1.00	A
2(2007)	Spring	Edge	0.86	0.89	A
3(2007)	Spring	Edge	0.67	1.00	B
1(2007)	Spring	Riffle	0.63	0.87	B
2(2007)	Spring	Riffle	0.79	1.01	B
3(2007)	Spring	Riffle	1.04	1.01	A
1(2008)	Autumn	Edge	0.71	0.98	B
2(2008)	Autumn	Edge	0.48	1.08	B
3(2008)	Autumn	Edge	1.01	1.00	A
1(2008)	Autumn	Riffle	1.03	1.10	A
2(2008)	Autumn	Riffle	1.08	1.01	A
3(2008)	Autumn	Riffle	0.89	1.10	A

Table 5.7: Loudwater River sampling - OE50 Signal scores and Band

OE50, OE50 Signal scores and Band. A: similar to reference sites, B: significantly impaired.

5.15.3.5 2008 Study Conclusion

- Low water levels and/or other site specific characteristics are most likely the reason for low OE50 scores at Site 2 (Autumn Edge) rather than pollution.
- Irrigation does not appear to be the cause of low OE50 scores at Site 2 (Autumn Edge), an examination of graph 3 (Site 2), shows the marked improvement in O/E50 for autumn Riffle from 2007 to 2008.
- At this stage it does not seem that irrigation practices are adversely impacting on the Loudwater River.

5.15.4 Flora and Fauna.

There are no known potential or actual significant flora or fauna impacts on the immediate or surrounding area of the Hampshire mill site.

5.16 Cultural and aboriginal heritage.

There are no known sites of cultural or aboriginal heritage at the Hampshire mill site.

5.17 Noise.

The Hampshire mill's remote proximity to any domestic premises, and the inclusion of surrounding plantation screens ensure that noise emissions are minimised.

6 Permit Conditions

Permit conditions are as per Licence Environmental Protection Notice No. 572/1, issued 9th May 2001 and EPN No. 327/3 issued 8th March 1999, copies of which are attached to this report (Appendix 1 and 2).

7 Relevant Environmental Legislation

(Tas) Environmental Management & Pollution Control Act 1994
(Tas) Environmental Management & Pollution Control (Waste Management) Regulations 2000
(Tas) Environmental Management & Pollution Control (Miscellaneous Noise) Regulations 2004
(Tas) Agricultural & Veterinary Chemicals (Control of Use) Act 1995
(Tas) Agricultural & Veterinary Chemicals (Control of Use) Order 1996
(Tas) Agricultural & Veterinary Chemicals (Control of Use) Order 2001
(Tas) Boundary Fences Act 1908
(Tas) Building Act 2000
(Tas) Building Regulations 2004
(Tas) Dangerous Goods Act 1998
(Tas) Dangerous Goods (General) Regulations 1998
(Tas) Fire Services Act 1979
(Tas) Land Use Planning & Approvals Act 1994
(Tas) Pollution by Waters of Oil and Noxious Substances Act 1987
(Tas) State Policy for Water Quality Management 1997
(Tas) State Policies and Projects Act 1993
(Tas) Weed Management Act 1999
(Tas) Workplace Health & Safety Act 1995
(Tas) Workplace Health & Safety Regulations 1998
(Aus) Energy Efficiency Opportunities Act 2006
(Aus) National Greenhouse & Energy Reporting Act 2007
(Aus) Environment Protection & Biodiversity Conservation Act 1999
(Aus) National Environmental Protection Measures (NEPMS)

8 Register of External Complaints

There was only one external complaint received during the three year reporting period and this is detailed in Table 8.1 below:

Date	Incident	Detail
13/05/08	Community - Complaint	Report: Community member complained of wood chips deposited on the Ridgley highway and throughout his yard and driveway. Response: 1) Visited the complainant and inspected spillage. 2) Complainant was unable to identify specific truck. 2) All cartage contractors advised of the spillage and requested that they inspect all vehicles for containment breaches, and supply information regarding inspection and maintenance procedures in place to ensure product containment is achieved. Incident closed.

Table 8.1: Register of external complaints 2005/06 – 2007/08

9 Environmental Incidents

There were no non-trivial environmental incidents or incidents of non-compliance with the permit conditions during the reporting period.

10 Infringement Notices

There were no infringements notices or environment protection notices issued under EMPCA during the reporting period.

11 Environmental Monitoring

Ongoing monitoring has been conducted in accordance with the conditions of the EPN (Appendix 1).

11.1 Groundwater monitoring

Groundwater is tested annually and the results are listed in Table 11.1 below:

Year	Bore	BOD (mg/L)*	TDS (mg/L)*	Conductivity (µS/cm)*	pH+
2005/06	DB5	<5	67	97	5.78
	TPB	<5	43	63	5.59
2006/07	DB5	<5	64	92	5.50
	TPB	<5	44	65	5.40
2007/08	DB5	<5	64	76	5.32
	TPB	<5	55	52	5.23

Table 11.1: Groundwater monitoring 2005/06 – 2007/08

**** Analytical Services Tasmania conducted laboratory analysis 2006/07 & 2007/08.***

+ Echo Remediation conducted field measurements 2006/07 & 2007/08.

Samples collected July 2005 by Echo Remediation in accordance with Australian Standard groundwater sampling protocols. Analysis by Water ECOscience Pty. Ltd. (NATA Registered Laboratory).

Samples collected June 2006 and June 2007 by Echo Remediation in accordance with Australian Standard ground water sampling protocols. Analytical Services Tasmania conducted laboratory analysis. Echo Remediation conducted field measurements.

11.2 Irrigation plot water discharge monitoring

Monitoring of irrigation plot water discharge commenced in July 2007 and the results are shown in Table 11.2 below:

Sample Date	Conductivity µS	NFR	BOD	Oil & Grease	Faecal coliforms	Compliant
3/07/07	N/A	2.0	<5	3	170	Yes
25/06/08	58	< 1	<5	< 1	20	Yes
25/06/08	45	< 1	<5	< 1	< 10	Yes

Table 11.2: Irrigation plot water sampling results

11.3 Loudwater River flow monitoring

Loudwater River flow rates are monitored and the monthly results are listed in Tables 11.3 – 11.5 below:

Month	Min	Mean	Max
	Cumecs[a]		
July	0.144	0.529	1.646
August	0.549	1.311	2.781
September	0.426	0.923	2.218
October	0.471	1.131	2.905
November	0.261	0.661	1.466
December	0.219	0.378	0.797
January	0.060	0.151	0.561
February	0.031	0.053	0.095
March	0.017	0.043	0.409
April	0.035	0.196	1.042
May	0.141	0.368	1.155
June	0.116	0.221	0.856

Table 11.3: Loudwater River flow 2005/06

Month	Min	Mean	Max
	Cumecs[a]		
July	0.241	0.593	1.418
August	0.303	0.515	1.181
September	0.174	0.438	1.292
October	0.133	0.259	0.632
November	0.05	0.098	0.168
December	0.008	0.045	0.113
January	0.002	0.041	0.226
February	<0.001	0.002	0.026
March	<0.001	0.002	0.016
April	<0.001	0.001	0.076
May	<0.001	0.395	2.834
June	0.138	0.317	1.793

Table 11.4: Loudwater River flow 2006/07

Month	Min	Mean	Max
	Cumecs[a]		
July	0.160	0.400	1.045
August	0.393	1.234	3.500[c]
September	0.277	0.660	3.036
October	0.285	0.919	2.844
November	0.080	0.226	0.556
December	0.083	0.266	1.104
January	0.022	0.111	0.282
February	0.004	0.066	0.219
March	0.000[d]	0.052	0.356
April	0.094	0.225	0.686
May	0.119	0.408	1.588
June	0.210	0.628	1.622

Table 11.5: Loudwater River flow 2007/08

a. All values are in cumecs (cubic metres per second)
b. Measurements taken at weir on Loudwater River near Gunns Hampshire security gate
c. Maximum value for Aug 2007 is an estimate. Sensor provided over range readings due to extensive flooding on 11 Aug 2007
d. Flow may have stopped for a period of a few hours on 18 March 2008. Very low rainfalls were recorded around this time

12 Staff and Contractor Environmental Training

All site employees are given induction training which includes details of the company's environmental policy and commitment to the aims of ISO14001.
The site manager is responsible for ensuring that all employees are mindful of the company's environmental policy at all times.
Contractors are given individual inductions, which includes details of the company's environmental policy and a contractor's handbook.

13 Community Engagement

The Hampshire facility contributes significantly in terms of direct and indirect employment to the economy of North Western Tasmania and particularly the Burnie/Ridgley/Hampshire area.
The mill has good relations with the surrounding residents.
While problems are minimal the local community is free to consult with the site Manager.

14 Review of Other Environmental Activities

The following environmental improvement activities were conducted in the reporting period, and these are above and beyond the requirements of the Permit.

14.1 Review of 2006/07 commitments

Target	*Comments*
Reduce mill energy consumption	**Concentration of all processing through the South crane has enabled the North crane and associated plant and equipment to be reserved for emergency operations only.** **Log delivery schedules implemented to reduce double handling of products.**
Reduce mill bark waste generation	**Effective 1st January 2005 new policy introduced to guide supply & transport contractors, stating no unbarked eucalypt logs will be accepted at Hampshire Mill.** **Debarking process reserved for emergency operations only.** **Reduced double handling of products.**

Table 14.1: Review of commitments from 2006/07 report

14.2 Overall Compliance Statement 2005/06 – 2007/08

Environmental Aspect	*Management procedures*	*Relevant changes to procedures since 2004/05*
Production Quantities	In accordance with permit volumes.	No change, Compliant
Waste Water	Continued treatment of storm and process water before dispersal off site through the approved reuse and emission point.	No change, Compliant
Atmospheric emissions	Effective cover or other means for incoming/out going wood chip or wood waste cartage.	No change, Compliant
Noise	Maintenance of current hours and controls.	No change, Compliant
Solid Wastes	No on site refuse burial.	No change, Compliant
Hazardous materials	Storage in accordance with Dangerous Goods Act/ AS 1940. All other materials in bulk form to be adequately bunded. Removal of hazardous wastes using licensed contractors.	No change, Compliant
Aesthetics	Maintain visual screen.	No change, Compliant
Monitoring	Water monitoring program.	Groundwater monitoring now conducted by external contractor in accordance with Australian Standards. Analysis by NATA Registered Lab. New Aquatic Fauna procedure developed, Compliant
Review	Review of EMP.	No change, Compliant

Table 14.2: Overall compliance statement 2005/06 – 2007/08

15 Commitments for 2008/09 period

The following environmental improvement activities, which are above and beyond the requirements of the Permit, have been committed to during the 2008/09 reporting period:

Objective
Refine log delivery schedules to optimise processing efficiency and reduce losses due to double handling.
Review log unloading options to reduce plant operations and equipment.

Table 15.1: 2008/09 commitments

16 Requested changes to permit conditions and requirements

There are no requested changes to EPN conditions.
However it is requested that EPN 327/3 and EPN 572/1 be combined into the one EPN to avoid confusion.

17 Anticipated environmentally significant changes for 2008/09

Harvesting of mature *Pinus radiata* plantations surrounding the mill site is planned for the 2008/09 period.
The *P.radiata* plantations provide a staggered tier visual screen for the mill site, and harvesting of the mature tier is planned given the growth of secondary tier *P.radiata* plantations.