



CASE STUDY

Alpine MDF Industries water recycling study

1. Company profile

Alpine MDF Industries Pty Ltd (Alpine MDF) is a manufacturer and supplier of medium density fibreboard (MDF). MDF is produced wholly from radiata pine, the majority of which is supplied in the form of radiata pine plantation thinnings and clear fell chip logs. Alpine MDF manufactures 140,000 m³ of MDF annually which it sells to customers in Australia, Asia and the USA.

The plant, located near Wangaratta in north-east Victoria, was commissioned in 1996. The manufacturing facility is continuously upgraded and maintained to keep abreast of the best equipment and processing technology available. Alpine MDF maintains and regularly reviews its Environmental Management Plan, which details the targets and strategies to be undertaken to continually improve their level of environmental performance and further prevent pollution.

Alpine MDF is currently involved in the Victorian Government's water management action plan (waterMAP) program. As part of the program users of > 10 ML of drinking water per year are required to:

- Assess their current water use
- Identify inefficiencies and opportunities for water savings
- Prepare an action plan to implement water conservation activities
- Annually report on implementation of water conservation activities

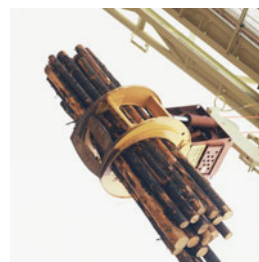
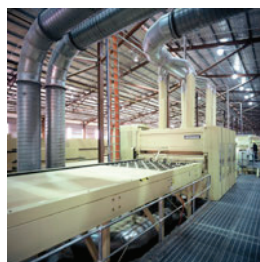
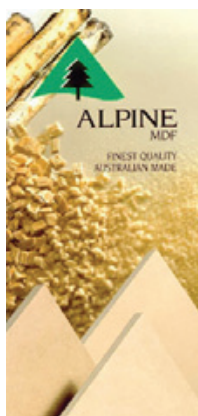
2. waterMAP Assist

The Australian Industry Group (Ai Group) is committed to working with member companies to encourage continuous improvement, resource efficiency, use of recycled water where possible, and reduced usage of drinking water. Ai Group's waterMAP Assist program has provided resources and funding to member companies to assist them implement initiatives contained in waterMAPs and deliver water savings in industry.

3. Project summary

Ai Group's waterMAP Assist program provided funding to enable Alpine MDF to undertake an investigative study on the opportunities for water reuse and water use reduction on-site, and provide an indicative costing for project implementation.

The major area of drinking water use at Alpine MDF site at Wangaratta is in the boiler. The boiler requires a stringently controlled water source and as such, drinking water is treated in a water softener to remove the majority of magnesium and calcium ions ("hardness") before being used in the boiler. The cooling tower also requires high quality, "soft" water, although the treatment requirements are not as stringent as for the boiler. Other major water users include the chip wash and debarking processes and onsite irrigation, none of which have the same stringent water quality requirements as the boiler and cooling towers.



4. Key findings

The three main alternatives to using Wangaratta's drinking water were identified:

- Treating and recycling trade waste for reuse on-site
- Purchasing recycled water from the North Wangaratta Treatment Facility
- Harvesting stormwater from impervious surfaces on-site such as the roof of the main building (catchment area of approximately 16,000m³)

The investigation identified that treating wastewater on-site would not be economically viable given current water prices and the low quality of the wastewater. It was further identified that North East Water would be required to upgrade the North Wangaratta Wastewater Treatment Facility in order to improve the quality of recycled water it produces from Class C standard to the Class A standard recycled water required by Alpine MDF's processes. A decision on such upgrades is outside the control of Alpine MDF. The stormwater harvesting option was therefore identified as the most viable option for Alpine MDF to implement, given it was relatively inexpensive (in comparison to treating and recycling wastewater) and easy to implement.

In developing the stormwater reuse scheme utilising water from the Alpine MDF facility rooftop, an analysis was undertaken to assess the following:

- An appropriate storage size
- Water quantity available for reuse
- The security of supply of storage systems based on the estimated volume of stormwater supplied

In developing an optimal stormwater reuse system, a water balance model was developed using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC). Two scenarios were considered:

- Scenario 1 - harvesting water from the east facing length of the roof
- Scenario 2 - harvesting water from the entire roof area

The extent of investment required to facilitate both scenarios was varied, given that Scenario 2 required considerably more length of pipe to be installed. The yield analysis was undertaken

for both Scenario 1 and Scenario 2 using varying storage sizes to optimise the preferred system.

5. Water savings

Based on this analysis, the optimised capture and supply system is a 500 kL storage capturing the entire roof runoff (Scenario 2). A storage tank or covered and lined storage dam were the recommended storage types as these will minimise losses due to evapo-transpiration. It is estimated that this option could reduce consumption by approximately 6,400 kL/year.

6. Project costs and payback periods

The preferred stormwater reuse system has a total capital cost of \$135,000 and an annual operation cost of \$3,000. Based on the total capital cost and ongoing maintenance costs, the project has an estimated simple pay back period in the vicinity of 25 years. Although this is a considerable period it should be noted that the cost of drinking water is likely to rise considerably over this time and the actual payback period is likely to be shorter.

7. Additional business benefits

Another key benefit to Alpine MDF is that this initiative, once implemented, would reduce its reliance on drinking water, assisting in "drought proofing" the business.

8. Project barriers

The high quality of water required for the boiler and cooling tower limits possibilities for water reuse at Alpine MDF. Further, it has been found that the quality of all trade waste currently leaving the site is not suitable for any reuse without prior treatment, thus further reducing the number of viable options that can be easily implemented.

Further information

Travis McKenzie
Safety and Environment Officer
Alpine MDF Industries
Tel: 03 5721 3522
Email: travis.mckenzie@alpinemdf.com.au

Australian Industry Group
Tel: 1300 733 752
Email: sustainablebusiness@aigroup.asn.au
Website www.aigroup.com.au

Ai Group's waterMAP Assist program, supported by the Department of Sustainability and Environment (DSE) has enabled Ai Group to work with large industrial water users to identify and implement water savings.