



## PROJECT OUTCOME

# CMI OPERATIONS PTY LTD

CMI Operations Pty. Ltd. worked in partnership with their local water business, Central Highlands Water, to develop a trade waste management plan focusing on trade waste volume and heavy metal reductions.

By using a cleaner production approach the company was able to reduce their flow by 57,000 litres per day, eliminate the use of caustic soda in their cleaning process and, as a result, stop their heavy metal discharge to sewer. These initiatives saved the company \$12,700 per year, resulting in a payback period of less than one year.

## BACKGROUND (2003)

CMI Operations is an international company manufacturing pressed metal components for the automotive industry and other applications. CMI's operations at Ballarat have been changed and modified over time and with them the processes and infrastructure. An ISO 14001 accredited company, CMI Operations is committed to improving its overall environmental performance.

## THE PROCESS

The process involves the manipulation and machining of metal components by high speed cutting machinery and large stamping presses. Metal finishing is also an integral part of daily operations, with components subjected to heat treatment, surface preparation and coating with rust inhibitors and metal based surface veneers.

These processes have historically resulted in high concentrations of zinc, chromium and oil in the trade waste discharged to Central Highlands Water's sewers. Heavy metal concentrations can affect the reuse options of biosolids from a water business treatment plant.

## THE INITIATIVE

While concerns were predominantly related to heavy metals, investigations revealed an opportunity to make a significant reduction in water use.

CMI in partnership with Central Highlands Water embarked on a trade waste management plan focused on reducing heavy metal loads and total trade waste flows to sewer.

Focusing attention on these parameters allowed CMI staff to identify problem areas within the factory. A simple site visit helped identify the key processes and equipment generating a large percentage of the trade waste.

Working with Central Highlands Water, CMI Operations developed a range of options including recycling of cooling water and minimising heavy metal residue to sewer.

To minimise the total volume of trade waste discharged, a closed circuit recovery and cooling system was installed to recycle gas furnace cooling water. This high quality cooling water was found to be uncontaminated and had excellent potential for re-use.

Heavy metal discharges to sewer can often be a complex issue to address, however the approach taken by CMI was surprisingly simple. Staff started by questioning the processes up-stream of the point of discharge to sewer and made some simple observations.

CMI staff discovered that hundreds of litres of heavy metal laden wastewater was regularly discharged from a large caustic bath. This was a historical practice that had no direct bearing on product quality.

As a result the caustic bath is no longer used to clean equipment, instead a small water efficient pressure cleaner is used inside a purpose built spray booth. The much lower volume of concentrated wastewater generated is now pumped to a holding tank and transported off site to an appropriate treatment facility. Further work is now being done to reduce the metals at the source.



✗ Caustic bath discharged into the sewer each week.



✓ A new spray booth reduces the volume of wastewater generated and minimises both

transport and treatment costs.

## BARRIERS

Having reduced the volume of water discharged to sewer, CMI discovered that the reduced flow had resulted in other parameters such as chemical oxygen demand (COD) and the concentration of oil and grease increasing in the discharged water. This was an important consideration since CMI's trade waste agreement contains prescribed limits for these and other parameters, therefore compliance with the trade waste agreement may have been compromised.

Given the proactive approach taken by CMI and the partnership approach with Central Highlands Water, the company and the water authority developed a way to address these concerns. Central Highlands Water recognised that, while COD, oil and grease concentrations had increased, the total load in fact had not. This meant the effect on the treatment plant had not changed.

Both parties then agreed that the next trade waste management plan would focus on reducing concentrations of COD, oil and grease. It has also been recognised by Central Highlands Water as an important and valuable step in the right direction.

## ACHIEVEMENTS AND SAVINGS

The recycling of cooling water reduced potable water consumption and trade waste volumes by 57,000 litres per day. This more than halved their total daily volume. This initiative will provide an annual saving of approximately \$8400 for potable water alone and more than \$2000 in trade waste charges.

By changing its cleaning processes, CMI completely eliminated its heavy metal discharge to sewer. This resulted in a further \$1700 saving in trade waste charges. It also managed to reduce its use of caustic, saving a further \$600 per annum and reducing the discharge of sodium, a limiting factor in water reuse to the treatment plant.

Compared to the cost of implementation at around \$12,000 the collective savings provide a payback period of little more than 12 months.

While the financial savings and trade waste reductions have been impressive, this partnership importantly built a strong working relationship between CMI and Central Highlands Water. This relationship was an important part in overcoming the barriers listed in this case study.

For Central Highlands Water, the key achievement from this partnership was the elimination of heavy metals being discharged to sewer. The reductions achieved by CMI will assist in improving biosolids

quality and decreasing the risk to various re-use projects.

These initiatives have provided CMI Operations with an opportunity to positively affect the environment beyond the bounds of its factory, something that can rarely be quantified in dollars and cents.

## LESSONS

Some lessons were learned from this partnership:

1. A successful solution to a problem depends on the co-operation and support of both the customer and the water business. A partnership approach is vital.
2. Be aware of the consequences of your actions and plan for changing circumstances. This includes the potential for increased concentrations when recycling, or for deferring the problem rather than minimising or eliminating it altogether.
3. Do not over engineer a solution to a problem that can be avoided or minimised. Remember the waste hierarchy.

## PLANS FOR REDUCTIONS

Now that CMI has successfully dealt with its heavy metals and total volume, the trade waste management plan will be continually revised to ensure continuous improvement. The company is also investigating options for eliminating the use of chromium from its entire operation.

## CONTACT DETAILS

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