

TRADE WASTE MANAGEMENT PLANS – COOPERATIVE COMPLIANCE



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ABSTRACT

This paper highlights the benefits gained from the development and use of trade waste management plans, in support of trade waste agreements. Specifically, the paper outlines four key components relating to the successful development and implementation of trade waste management plans, with an aim to achieving specific outcomes in cooperation with stakeholders. The principles of trade waste management plans are discussed in detail, including the individual steps involved with the successful development of “meaningful” trade waste management plans and monitoring of outcomes and benefits achieved as a result. Central Highlands Region Water Authority has had many successes as a result of its use of trade waste management plans. This paper discusses those experiences, along with lessons learned.

1.0 KEY WORDS

Trade waste, waste minimisation, cleaner production, trade waste management plan.

2.0 INTRODUCTION

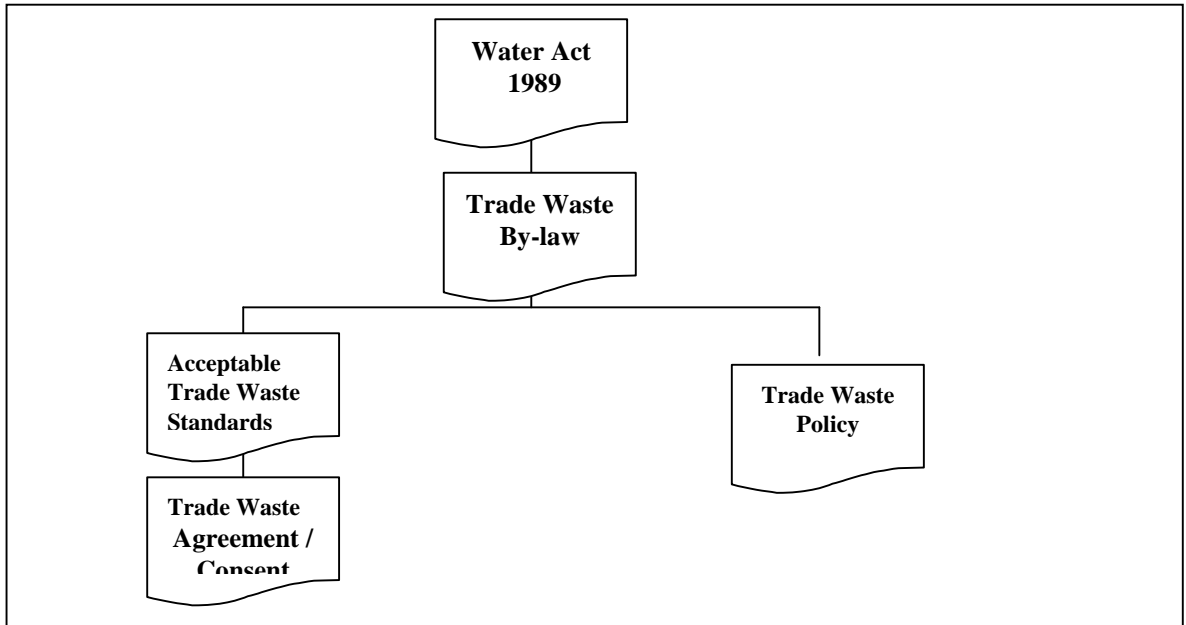
Victoria’s fifteen regional urban water authorities conduct business in accordance with the Victorian Water Act 1989 (Water Act). Aside from the many detailed legislative requirements set down under the Water Act, section 173 “Functions of Authorities”, provides that an authority shall “provide, manage and operate systems for the conveyance, treatment and disposal of sewage and, if it so decides, of trade waste”.

Further more, if an authority has decided to accept trade waste into its sewers, section 178 of the Water Act, headed “Protection of sewers”, states that “A person must not cause or permit anything other than sewage, or trade waste discharged in accordance with a trade waste agreement to be discharged into a sewerage system of an Authority”. This provides the underlying catalyst for an authority to develop and maintain a trade waste management system.

A typical trade waste management system may include a trade waste By-law developed in accordance with the Water Act, a trade waste policy set by the authority, a trade waste agreement or consent which is issued to customers that discharge trade waste into the authority’s sewers and a set of criteria that prescribes limits for individual contaminants.

Collectively, this provides a tiered management system aimed at managing the risks associated with the acceptance of trade waste and safeguarding re-use potential. Figure one below details the relationships typical of a trade waste management system.

Figure 1: Trade Waste Management System



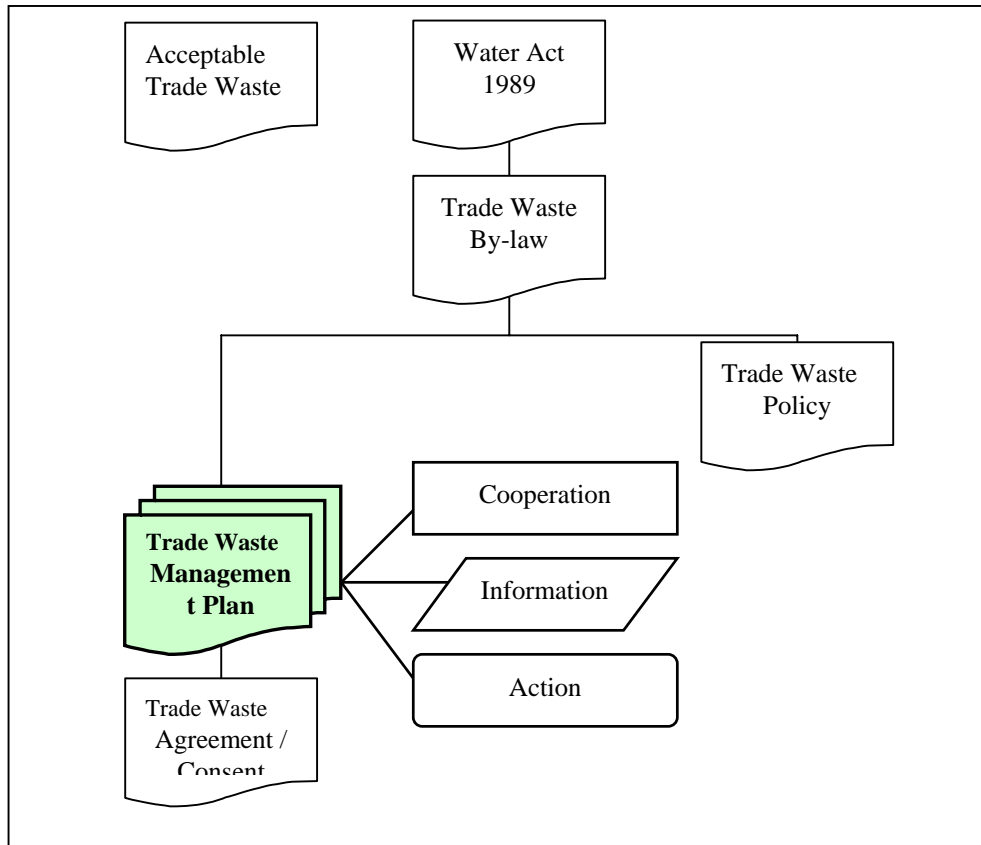
Trade waste agreements will often include prescriptive quality limits based on safety considerations, system integrity, treatment capacities and increasingly, re-use potential. As a consequence, many trade waste customers are unable to comply with stringent quality limits without significant change, often leading to either reluctance to sign a trade waste agreement or non-compliance with an existing agreement. Likewise, water authorities are limited in their ability to relax quality limits without compromising safety and or system efficiency. After all, water authorities are also accountable for the quality of water leaving their wastewater treatment facilities.

It is also understandable that the basic business objectives of the trade waste customer and that of the water authority will often differ. The authority's goal is to safeguard against risk, while invariably, the trade waste customer wishes to maximise profitability. Historically this is where legislative methodology has failed to bridge the gap.

However, a good Trade Waste Management Plan (TWMP) is an effective tool that has proven successful in linking both the water authority and the trade waste customer to an agreed action plan in support of a trade waste agreement. This paper highlights the principles supporting the development and use of TWMPs along with an explanation of the key steps involved. Figure 2 illustrates the inclusion of a TWMP to bridge the gap between prescribed limits and a signed trade waste agreement.

The Victorian Water Industry Association in partnership with the Victorian Environment Protection Authority has also recently published and released a set of guidelines titled "Trade Waste Management Plans – A Guide And Industry Template For Improving Trade Waste Discharges". As the name suggests, this guideline provides the framework for developing a TWMP with a view to reducing trade waste related contamination. This paper deals closely with the principles contained in these guidelines, while embellishing upon practical experience and realised benefits.

Figure 2: Trade Waste Management System Including TWMP



3.0 DISCUSSION

TWMPs provide a flexible joint in the customer/authority relationship, linking the customer's trade waste obligations with achievable milestones. It is therefore imperative that at the outset, both the customer and authority agree to a partnership approach.

Regardless of whom the customer may be, or water authority involved, two things remain constant. Poor trade waste performance will result in an adverse affect on the water authority's interests and the customer remains accountable. As a result, it is logical to expect that a unified approach to trade waste management is best. The interests of both customer and authority are best served through cooperation and understanding.

The water authority must engage the customer with a view to educating the customer of the issues and difficulties surrounding its discharge of trade waste. Only through developing the customer's awareness can the water authority hope to approach underlying issues with the support of those responsible.

Once the water authority and the customer have a mutual awareness of the issues surrounding the customer's trade waste discharge, both the customer and the water authority should seek the necessary permissions from their respective management to allow them to progress in partnership. At this point it is important to recognise that both parties have limitations and differing priorities. The term "partnership" implies a willingness to understand the other's position and to accommodate the other's needs where possible.

Having gained the support of management, a four-stage process provides the necessary ingredients for the development of a successful TWMP.

3.1 Collection of Information and Identification of Priorities

Collection of information and setting of priorities will help determine the scope of the TWMP. Efforts towards trade waste improvements must be properly focused in order to maximise any likely benefits. With so many potentially complicating factors surrounding trade waste quality, a maximum of three individual trade waste parameters should be addressed at any one time. Volume, or hydraulic capacity should be targeted in all cases, so that water conservation and potable substitution receive the attention they are due, leaving scope for two other trade waste contaminants.

Having a thorough knowledge of the customer's trade waste characteristics and an understanding of the subsequent down stream effect is imperative. If doubt exists as to the effect or importance of the customer's trade waste, then the expense associated with additional monitoring and technical advice is warranted. It is important to base priority parameters on meaningful information and legitimate concern.

The contaminants chosen for inclusion in the TWMP, should be chosen for their relative importance with regard to the risk of non-compliance with the customer's trade waste agreement, risk to health and safety and risk to the sustainability of re-use projects. A risk assessment conducted on the characteristics of the customers trade waste is a valuable aid.

The water authority primarily drives the setting of priorities, as priority parameters generally reflect a compliance deficiency, or risk. However, where possible the water authority should involve the customer so that awareness is maintained regarding drivers and flow on benefits. An informed customer is more likely to take ownership of the issues surrounding their company's trade waste discharge, particularly where the customer can see a mutual benefit.

Section 1 of the Trade Waste Management Plan guideline and template provides for the identification of "critical loads or contaminants".

3.2 Information Sharing and Goal Setting

Now that the scope of the TWMP has been defined, the customer and the water authority need to consider the best way to proceed. Importantly, both parties need to maintain the partnership by meeting regularly as a means of sharing information.

To achieve reductions in the volume or strength of the priority parameters, an understanding of the origin, or root cause of these parameters is necessary. However sharing information with the water authority can be daunting for the customer, therefore the water authority must exude an enthusiasm to work cooperatively. It is rewarding to the relationship to reinforce the aim of the exercise regularly, the aim is to implement cleaner production in partnership with the customer to the benefit of all concerned.

Sections 4 and 5 of the Trade Waste Management Plan guideline deals with the collection and sharing of information. The guideline also provides some valuable tools such as a process flow diagram template and root cause analysis template, for use in identifying the

process steps and root cause associated with the priority parameters. Collectively this information provides the basic ingredients necessary for the customer and water authority alike, to understand the issues surrounding the priority parameters. From here, both parties are now in a position to set achievable goals.

Goal setting should be done in consideration of many things. Thought should be given to issues such as expected benefits, the financial impost on the customer, available technology and the consequences of doing nothing. It is important that in setting these goals, both parties must agree that the goals are achievable. Keeping goals to a minimum ensures that the focus is maintained on the priority parameters.

3.3 Identification of Options and Plan Development

Together with an understanding of the priority parameters, an agreed set of goals provides the basis for identifying options that will allow the desired outcomes to be achieved.

At this point, the customer and the water authority should brainstorm all available options. It is important to think beyond treatment technology and consider process changes, or product substitution to achieve cleaner production. Recycling is often an easy means of waste minimisation, yet without simultaneous reductions in priority parameters, critical loads may not be improved.

Given that the customer will have an intimate knowledge of the processes and limitations of its operations, the water authority will most often rely on the customer to suggest process change. However the water authority will usually possess a greater awareness of treatment options. This combination serves to provide a comprehensive list of options from which to choose. The next key step is to assess these options based on benefit, cost and consequences.

It is also important that the water authority reiterate its expectations of the customer, as the customer is ultimately responsible for deciding which of the options it will implement. The water authority must eliminate any confusion with regard to what it believes constitutes an acceptable improvement. Simply by revisiting the previously agreed goals and ensuring that short listed options will suffice, development of the plan can begin. Section 6 of the Trade Waste Management Plan guideline offers a systematic approach towards developing and assessing options. This is particularly useful in providing structure when assessing options.

Developing the plan is a simple case of documenting what has been planned and how it will be implemented. While there are no hard and fast rules dictating what a TWMP will contain, experience tells us that a good TWMP will contain a minimum of three key ingredients, these being firstly, a description of the customer's trade waste circumstances and compliance deficiencies, secondly, an agreed action plan with objectives and timeframes designed to address compliance deficiencies and thirdly, a set of contingency plans for use in an emergency.

Regardless of how the customer chooses to present the TWMP, a consultation phase between both parties will ensure that each party is satisfied with the content of the plan. Once both parties have agreed to the plan, that is, once the plan satisfactorily addresses the agreed goals, then the plan should be appended to the customer's trade waste

agreement.

3.4 Implementation and Review

A well written trade waste agreement incorporating an agreed TWMP provides a pathway for continuous improvement as a condition of the agreement. In this way, the commitments contained in the TWMP become obligations under the terms of the trade waste agreement.

The regular review of the customer's trade waste agreement and TWMP offers insight into the customer's compliance with the agreed action plan, while periodic consultation with the customer helps to maintain both parties' understanding of changing circumstances.

As each of the objectives is achieved, both parties should assess the results and supplement the TWMP accordingly. At every stage, the TWMP must remain dynamic enough to cater for changing circumstances, such as concentrated waste streams.

4.0 CONCLUSIONS

Integrating a trade waste agreement with a TWMP provides an avenue for flexible trade waste minimisation. The constraints associated with prescriptive trade waste agreements are softened and in doing so, the ability of the customer to improve its performance becomes measurable.

Regardless of the extent of trade waste contamination or degree of compliance deficiency, the TWMP offers a systematic approach to implementing cleaner production and waste minimisation and encourages improvement from every customer within the customer's means.

A significant demand on resources can be expected when utilising a TWMP in support of a trade waste agreement. The negotiation and monitoring of TWMPs across a number of customers requires significant effort. However the benefits can be quantified to establish a rate of return.

5.0 CASE STUDY EXAMPLE

CMI Operations is an international company manufacturing pressed metal components for the automotive industry and various other applications. An ISO 14001 accredited company; CMI Operations is committed to improving its overall environmental performance.

Metal finishing is an integral part of daily operations, with components subjected to heat treatment, surface preparation and coating with various 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.

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 a number of

problem areas within the factory. A simple site visit helped identify the key processes and equipment generating a large percentage of the trade waste.

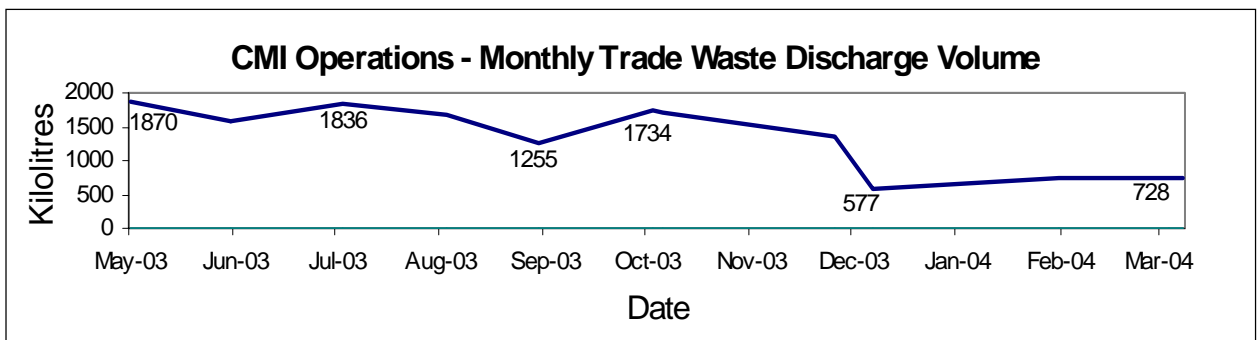
Working with Central Highlands Water, CMI Operations developed a range of options including recycling of cooling water and minimising heavy metal residue to sewer. To minimise the total volume of trade waste discharged, a closed circuit recovery and cooling system was installed to recycle gas furnace cooling water.

The approach taken by CMI to reduce heavy metal loads was surprisingly simple. Staff began 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 were regularly discharged from a large caustic bath. 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 transported off site to an appropriate treatment facility. Work is also being done to reduce the metals at the source.

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 provides an annual saving of approximately \$8,400 for potable water alone and more than \$2,000 in trade waste charges.

Figure 3: *Reduced Monthly Trade Waste Discharge Volumes*



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.

This partnership built a strong working relationship between CMI and Central Highlands Water and the relationship was an integral part in the development of CMI Operations' trade waste management plan and in overcoming troublesome non-compliances with CMI's trade waste agreement.

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 bio-solids quality and decreasing the risk to various re-use

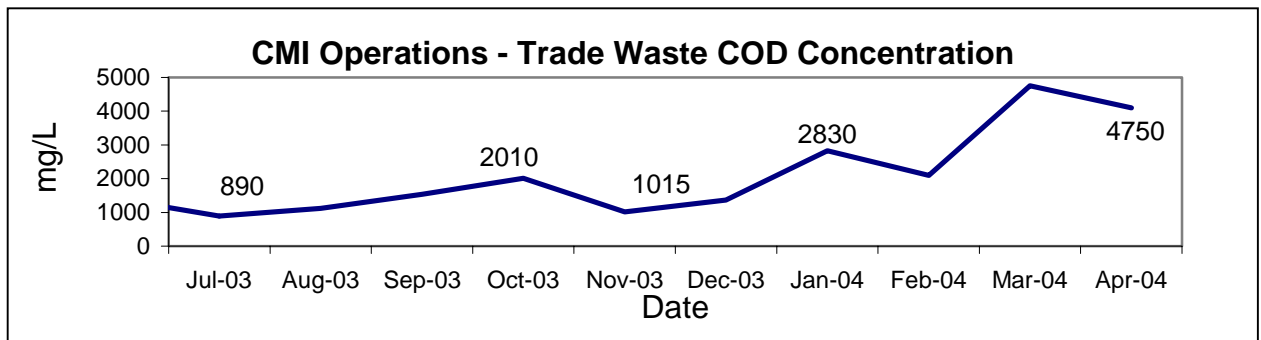
projects.

6.0 LESSONS

A successful solution to a problem depends upon the cooperation and support of both the customer and the water authority. A partnership approach is vital.

An awareness of the consequences of your actions is necessary in order to plan for changing circumstances. It is important to stay alert to the potential for increasing concentrations when recycling, or for deferring the problem rather than minimising or eliminating it altogether.

Figure 4: *Increased Chemical Oxygen Demand at CMI Operations Due to Recycling*



Don't over engineer a solution to a problem that can be avoided or minimised. Remember the waste hierarchy; cleaner production provides a better solution than disposal.

7.0 ACKNOWLEDGEMENTS

I would like to acknowledge the work that has been done by The Victorian Water Industry Association (VicWater) and Environment Protection Authority Victoria in developing the recently released "Trade Waste Management Plans – A Guide And Industry Template For Improving Trade Waste Discharges". The partnership between EPA and VicWater continues to provide beneficial direction to the Victorian water industry.

I would also like to acknowledge the efforts of Central Highlands Water's trade waste customers in working with the Authority towards waste minimisation and cleaner production through the development and use of trade waste management plans.

8.0 REFERENCES

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