

Innovative Partnership Program Helps Reduce Mercury To Sewer

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ABSTRACT

The Dentists for Cleaner Water Program was launched by the Victorian Minister for the Environment, Climate Change and Innovation, Gavin Jennings in August 2008. Since this time over 800 dental practices have installed or committed to install amalgam separators in a bid to reduce the amount of mercury going to sewer.

This voluntary collaboration between government and industry has achieved wins for the environment and the dental profession, through providing a sustainable solution for a serious pollutant.

INTRODUCTION

The mercury content of sewer discharges is a significant issue for Victoria's water industry, as it influences the ability to manage, treat, reuse or dispose of effluent and biosolids.

Mercury is discharged to the Melbourne sewerage system from industrial, commercial and domestic premises and is concentrated by treatment processes in the residual biosolids. A recognised source of mercury to sewer is the dental industry. This primarily results from the placement and removal of amalgam, or "silver fillings", which traditionally contain 45-50% mercury.

The Dentist for Cleaner Water Program aims to promote the installation and use of amalgam separators in private sector dental practices. This will help eliminate mercury from Victoria's sewerage systems and represents **collaboration and partnership** between the water industry, the dental industry, EPA Victoria and the Australian Industry Group (Ai Group).

BACKGROUND

In November 2006, Ai Group commissioned a consultant to conduct a feasibility study on dental waste reduction options. The project was supported under Ai Group's Sustainability Covenant with EPA Victoria (EPA), in collaboration with the Australian Dental Association Victoria Branch (ADAVB) and South East Water (SEW). At the time of the study there were an estimated 1370 private dental surgeries and 70 public sector dental surgeries across Victoria that were generating amalgam wastes.

The feasibility study was completed in October 2007, and included findings of a survey of member dentists of the ADAVB. The report estimated that 75g of mercury per dentist per year is discharged to sewer, which represents a total of 210 kg per year. Removals of 'silver' fillings were identified as producing the highest amount of amalgam waste per dental procedure. The survey indicated that the number of removals is about 3-4 times higher than the number of placements, which are decreasing at 10% per annum. The feasibility study also highlighted that at the time of the survey only 1-2% of dentists had amalgam separators installed. The primary

reason for this was that there were no published best practice management guidelines for the disposal of mercury waste. Additionally, dentists have not traditionally been regulated by water corporations as to their trade waste discharges, so there was little incentive to install amalgam separators. Estimates of potential reductions through the use of amalgam separators indicated that if 90% of private sector clinics installed ISO 11143 compliant amalgam separators then mercury loads could reduce from 210 kg per year to approximately 48 kgs per year. These estimates illustrated that significant reductions could be made through the best practice management of installing separators.

ISO 11143 compliant amalgam separators can effectively filter 95% of amalgam waste before it reaches sewerage systems. The filtered amalgam can then be safely recycled. There are a number of separators that comply with ISO 11143, and the program allows for any of these to be installed. The separators vary in size and method of removing mercury. Methods include filtration, centrifuge and sedimentation processes. This achieves the program's aim of segregating amalgam waste upstream, maximising the recovery of mercury before it enters the sewerage system. This assists efficient performance of sewage treatment plants and increases the opportunities for the water industry to implement beneficial reuse of the biosolids.

The study also examined approaches for installing amalgam separators, looking at mandatory and voluntary programs occurring in Europe and the United States. In Europe, many countries have regulated the installation of ISO 11143 compliant amalgam separators. This has resulted in a significant reduction in mercury levels detected in the biosolids. However, in many states of the United States, voluntary uptake was pursued first, having mixed results. Eventually regulation was introduced in states where the voluntary uptake had been slow. Despite regulation resulting in a higher uptake in the US and Europe, the Ai Group strongly supported a voluntary partnership approach for the installation of amalgam separators, as the benefits could be delivered more quickly than if the water industry introduced regulation. This approach was supported by the water industry. However, it was stated that if success was to be achieved, a voluntary program would require strong leadership, support and resources. From this recommendation the "Dentists for Cleaner Water" Program was developed. The success of this program has been achieved through the collaboration and partnership between the dental industry, water businesses and EPA Victoria.

THE SOLUTION - DENTISTS FOR CLEANER WATER

The 'Dentists for Cleaner Water' program was launched in August 2008 for a period of three years. Over \$1,000,000 has been committed to the rebate scheme with funding from South East Water, City West Water, EPA Victoria and the Victorian Water Industry Association. This funding will assist the ADAVB to develop and implement the program. These parties have also signed a four year Memorandum of Understanding to govern the program. This funding is assisting the ADAVB to promote installation of separator technology. The rebate component offers a minimum of \$1,000 for an ISO 11143 compliant Amalgam Separator or 20% of the total costs (purchase and installation) for the ISO 11143 compliant Amalgam Separator (whichever is greater) to private sector dentists. It is anticipated the rebate will be on a sliding scale, reducing over a three-year period.

While the rebate provides a real incentive for dentists to install amalgam separators, the overwhelming uptake of the program would not have been possible without the commitment demonstrated by the program partners. The results in Figure 1 indicate how successful the voluntary partnership has been so far. A major reason for the program's success has been the communications strategy and the commitment of

the project manager in engaging dentists in the program. This has involved intensive consultation with stakeholders such as the separator distributors, installers, waste collectors, plumbers and the dentists themselves. An initial meeting was held with stakeholders prior to the program commencing to gain support in delivering the program. Installers, suppliers and plumbers could therefore prepare for orders and install separators quickly. The project manager also attended many local and rural dental group meetings to promote the program, discuss rebate entitlements and provide a contact point for any issues that arise. This was a significant success factor to the program as it gave a direct point of contact for the dental practitioners.

The communications strategy has also contributed to the success of the program to date. An identifiable logo, brochures, pamphlets, newsletters, rebate forms and a website were all developed. Additionally, the ADAVB has put a large amount of effort into promotional activities, personal letters to dentists and attended dental conferences to garner interest and promote the program. Once dentists have installed the separator they also receive a certificate bearing the Dentists for Cleaner Water logo, which provides reputational benefits for the dentist and has received positive feedback. The processing of rebate forms has also been effective, providing a quick turn around time to dentists receiving the rebate. At present the program is on track to meet its target of amalgam separators installed in 250 dental practices by year one. The water industry has also agreed to extend the full rebate for another year, to encourage continued uptake.

While the program has been a success to date, there have been challenges to manage. One surprising challenge was the resounding support and interest shown in the program from the dental practitioners. The enthusiasm shown by dentists has made it important to manage the demand so dentists were not discouraged by the time taken to order and install a separator. In the first few months of the program commencing, installers put a hold on future orders in order to keep up with the demand. This has produced the surprising but welcome outcome of the creation of more jobs, as more installers and technicians have been required to meet the demand.

RESULTS

Figure 1: Quarterly Report as at 30/06/2009

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| Number of Claims Processed | 191 |
| Number of Practices Targeted | 1000 |
| Percentage uptake of the scheme (based on the target of 1000 practices) | 19.1% |
| Estimated amount of mercury diverted from sewer | 17464 grams |
| Number of commitments given to proceed with purchase and installation of separation technology (informal only) | 809 |
| Estimated number of orders in the pipeline (according to informal advice from installers) | 70 |
| Number of chairs to which separators have been attached based on claims processed | 472 |

****Please note that more up-to-date figures can be provided closer to the publication time.***

THE FUTURE

While, the program has been extremely successful, to ensure continuing success there are challenges ahead that will need to be addressed and monitored. Firstly is the assurance that the amalgam waste is being collected appropriately. While dentists have committed through the rebate conditions to sending the collected mercury to the mercury recyclers, it is important to ensure this practice is occurring and that the amalgam waste is being collected responsibly. The program is addressing this by negotiating with the recyclers and collectors to provide data as to the amount of mercury being collected, and thereby prevented from going to sewer. This information provides a good reporting mechanism to the funding partners on what the program is achieving. The mercury recovered by the recycler is primarily used to produce new dental amalgams for domestic use and export, creating a closed loop service.

Another challenge is keeping the momentum going. This will be supported through regular communications from the project manager containing updates regarding the program and the rebate amount. The dental sector recognises that the issue could be regulated in the future, so this is a good opportunity to install separators while a rebate is available. Ensuring rebates are processed in a timely fashion, and with the steering committee addressing any potential issues, continued interest and support from the dental industry for the program should be assured. Following the success of this Victorian project the ADA's Federal body and the Dental Industry Association (representing suppliers) are now developing a National Dental Sustainability Charter.

CONCLUSIONS

The Dentists for Cleaner Water program is an excellent example of partnership, collaboration and voluntary participation providing significant environmental outcomes without red tape. This was possible due to the commitment of the parties involved, and the enthusiasm shown by dentists to reduce the amount of amalgam waste going to sewer. Once the 'Dentists for Cleaner Water' program ends in June 2011, the program outcomes will be assessed. However, the results have demonstrated that sustainable solutions can be achieved through a voluntary approach of partnership and collaboration.

ACKNOWLEDGEMENTS

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REFERENCES

URS (2007) Final Report: Amalgam Waste Management and Mercury Discharges to Sewer from Victoria's Dental Industry, Victoria

BIOGRAPHIES

Sally MacPhail

Sally MacPhail has been with EPA since 2000. She has worked in many varied areas of the organisation including, as reference librarian, policy officer, ballast water officer and most recently as a Trade Waste project manager within the Sustainable Solutions unit.

She joined EPA after three years with BHP Petroleum. She has a background in the Arts, most recently completing a Graduate Diploma in Environmental Studies at Melbourne University.

The Sustainable Solutions Unit focuses on EPA's industry partnership programs and the 'beyond compliance' work with Business and Industry. This area has specific priorities around improving resource efficiency and reducing the generation and disposal of Trade Waste and Prescribed Industrial Waste. These objectives are closely linked to EPA's objectives of 'benefit the economy', 'increase resource efficiency', 'enhance our reputation', 'tackle climate change' and 'reduce emission impacts'.

Ian Crawford

Ian Crawford was appointed Project Manager - "Dentists for Cleaner Water" in January 2008. His background is in Dental Materials having worked in the Dental Industry for nearly 40 years.

The positions occupied during that period of time have been from National Sales Manager onto National Marketing Manager through to State Manager and also General Manager for his respective Companies.

Ian has visited many International Dental Plants viewing materials and their usage and attended globally a variety of Dental Conferences and Exhibitions.

The Australian Dental Industry Association awarded Ian a 'Life Member' for his honorary service given over many years to that body and the Australian Dental Association presented Ian with a "Distinguished Service" order for his contribution to that group.

Finally Ian's work with "Dentists for Cleaner Water" sees him involved with the Dental Profession, Dental Industry organisations and the Service Installers which together make up the active day to day participants in this important subject.