

TAKE PREVENTIVE ACTION NOW.  
CAPTURE AMALGAM SO IT  
DOESN'T RELEASE MERCURY.



re:amalgam  
recovery



On September 28, 2002, the Minnesota Dental Association House of Delegates unanimously passed a resolution that the MDA develop and implement a voluntary amalgam separator installation program throughout the state. Why a voluntary program? There are compelling reasons.

Two Minnesota-based studies conducted by the MDA and Metropolitan Council Environmental Services showed that amalgam separators are effective at removing amalgam from dental office wastewater and that the use of amalgam separators will reduce the amount of amalgam present in wastewater treatment plant sludge. Since most of this sludge is incinerated, less amalgam waste means less mercury is released into the air. And less mercury collects in our lakes and rivers.

Furthermore, dentists are educated professionals who care about the environment. After we presented testimony that dentists are not like other industries, the Metropolitan Council agreed to try a voluntary program. The usual regulatory approach will not be implemented if all non-exempt Minnesota dental offices install amalgam separators. Though the Metropolitan Council has authority over only dental offices based in the Twin Cities, another government agency is likely to regulate outstate offices that do not comply.

Dentists throughout the entire state have a unique opportunity to demonstrate our concern for the environment, under our own initiative. The MDA is devoting time and resources, such as this information booklet, to help dental offices easily install amalgam separators and dispose of amalgam properly. We urge you to review the material carefully and then make a commitment to install an amalgam separator as quickly as possible.

A handwritten signature in black ink, appearing to read "Scott D. Lingle".

Scott D. Lingle, D.D.S.  
President, Minnesota Dental Association

In 1998 the Metropolitan Council and the Minnesota Dental Association formed a partnership designed to answer questions about amalgam in wastewater and determine the most appropriate actions. Together we conducted two studies that evaluated dental amalgam separation equipment and measured the loading of mercury from dental offices to the sanitary sewer.

The results from those studies established a scientific basis for concluding that advanced amalgam separation equipment can be cost effective in removing amalgam particles from dental office wastewater and that such equipment should be installed. The point is not how much dental offices contribute to the source of mercury in our Minnesota lakes and streams. More important is the fact that even in tiny quantities, mercury harms the environment, and that dental offices can easily and dramatically minimize the amount of amalgam discharged via office wastewater.

On behalf of the Metropolitan Council and everyone who lives in Minnesota, I thank you for your timely cooperation.

A handwritten signature in black ink, appearing to read "Peter Bell".

Peter Bell  
Metropolitan Council Chair

AMALGAM WASTE IS GENERATED FROM PLACEMENTS AND REMOVALS

CHAIRSIDE TRAP CATCHES LARGE PARTICLES

WASTE IS DISCHARGED TO VACUUM FILTER

AMALGAM WASTE IS DISCHARGED TO SEWER

AT WASTEWATER TREATMENT PLANT WASTE SETTLES IN HOLDING TANKS

PLANKTON ABSORB MERCURY, FISH EAT PLANKTON, HUMANS AND ANIMALS EAT FISH



BIOSOLIDS FROM HOLDING TANKS ARE:

A. INCINERATED AND MERCURY IS RELEASED FROM AMALGAM AS A VAPOR THAT SETTLES ON LAND AND WATER

B. SPREAD ON LAND

C. BURIED IN LANDFILL

re:think

# It's time to reconsider the way you handle amalgam.

You already know amalgam contains mercury. What you may not realize is that amalgam releases elemental mercury when it is incinerated. Vaporized mercury then settles on land and water. Because mercury doesn't ever break down, it bioaccumulates in the environment and causes health problems throughout the food chain.

By taking preventive action now, Minnesota dentists can help restore the health of our environment. The solution is both cost effective and simple. The answer is an amalgam separator.

Chairside traps collect the large chunks of amalgam when restorations are placed or removed, or approximately half of the amalgam generated. Chairside traps combined with a vacuum filter remove even more – up to approximately three-fourths of the amalgam generated. With the installation of an approved separator, dentists can prevent 99% of their amalgam waste from entering the office wastewater and contributing to the accumulations of mercury in our lakes and streams.

Amalgam waste that is captured can be processed by a recycling facility to recover mercury safely. However, if dentists don't capture amalgam waste, it ends up in wastewater treatment plant sludge that is incinerated or applied to fields where our food is grown. Dentists have already taken steps to capture amalgam in the dental office through the use of best management practices. But we need to do more. As an example, we can look to the voluntary, cooperative program in the Duluth area, where dentists have installed amalgam separators to reduce the amalgam and mercury discharge into Lake Superior. Now dentists throughout all of Minnesota have the opportunity to be proactive environmental stewards.

The Minnesota Dental Association strongly recommends that you install an approved amalgam separator. It is a reasonable, cost-effective way for Minnesota dentists to stop contributing mercury to our lakes and streams. It's the right thing to do – for your practice, the community, and the environment.

AMALGAM RELEASES  
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"IF YOU TALK TO  
SOME OF US WHO  
ALREADY HAVE THEM,  
WE WILL TELL YOU THAT  
SEPARATORS REALLY ARE  
AN EASY STEP TO TAKE.  
WE KNOW THEY WORK.  
IT'S THE RIGHT THING  
TO DO. IT'S THE RIGHT  
TIME TO DO IT."  
JAMES WESTMAN, DDS

"I AM WRITING TO EXPRESS OUR SUPPORT FOR YOUR PROPOSED DENTAL MERCURY REDUCTION PROGRAM. IT IS CLEAR FROM YOUR PAST RESEARCH ON THIS ISSUE AND YOUR PROPOSAL THAT THE METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES (MCES) AND THE MINNESOTA DENTAL ASSOCIATION HAVE COLLABORATED TO UNDERTAKE AN EFFORT THAT WILL ELIMINATE A SIGNIFICANT AMOUNT OF MERCURY FROM BEING RELEASED TO THE ENVIRONMENT...AS YOU KNOW, MERCURY CONTAMINATION OF FISH IS A WELL-DOCUMENTED PROBLEM IN MINNESOTA. SOURCES OF MERCURY IN THE STATE ARE MANY AND ACCORDING TO OUR ANALYSIS, THE MASS OF AMALGAM-MERCURY IS A SIGNIFICANT SOURCE OF RELEASES TO THE ENVIRONMENT. YOUR EFFORTS, ALONG WITH EFFORTS BY THE MINNESOTA DENTAL ASSOCIATION TO PROMOTE THESE ACTIONS STATEWIDE, WILL LIKELY MAKE A DEEP CUT INTO THIS SOURCE."

EXCERPTED FROM  
A LETTER FROM 2002  
MINNESOTA POLLUTION  
CONTROL AGENCY  
COMMISSIONER  
KAREN A. STUDDERS

The effectiveness of amalgam separators has been established. A recent community-wide dental mercury study in Minnesota showed that with amalgam separators in place at most dental offices, mercury levels in wastewater treatment plant sludge declined by as much as 29 - 44%. Furthermore, amalgam separators are inexpensive, easy to maintain, and compatible with wet or dry vacuum systems.

It makes sense to install an approved amalgam separator in your dental office, for several reasons. First, you will prevent 99% of amalgam waste from entering the wastewater. Second, the installation of an amalgam separator is merely an extension of your current best practices for handling potentially hazardous waste. Third, those who do not install an approved amalgam separator will be subject to government regulation.

Minnesota dentists have the opportunity to participate voluntarily in the amalgam recovery program. By participating voluntarily, a metro-area dental office will avoid significant expenses such as obtaining permits, monitoring wastewater, and paying annual permit fees. After installing an approved amalgam separator, a metro-area dental office will receive a certificate of compliance. Certification from the Metropolitan Council ensures that a metro area dental office will:

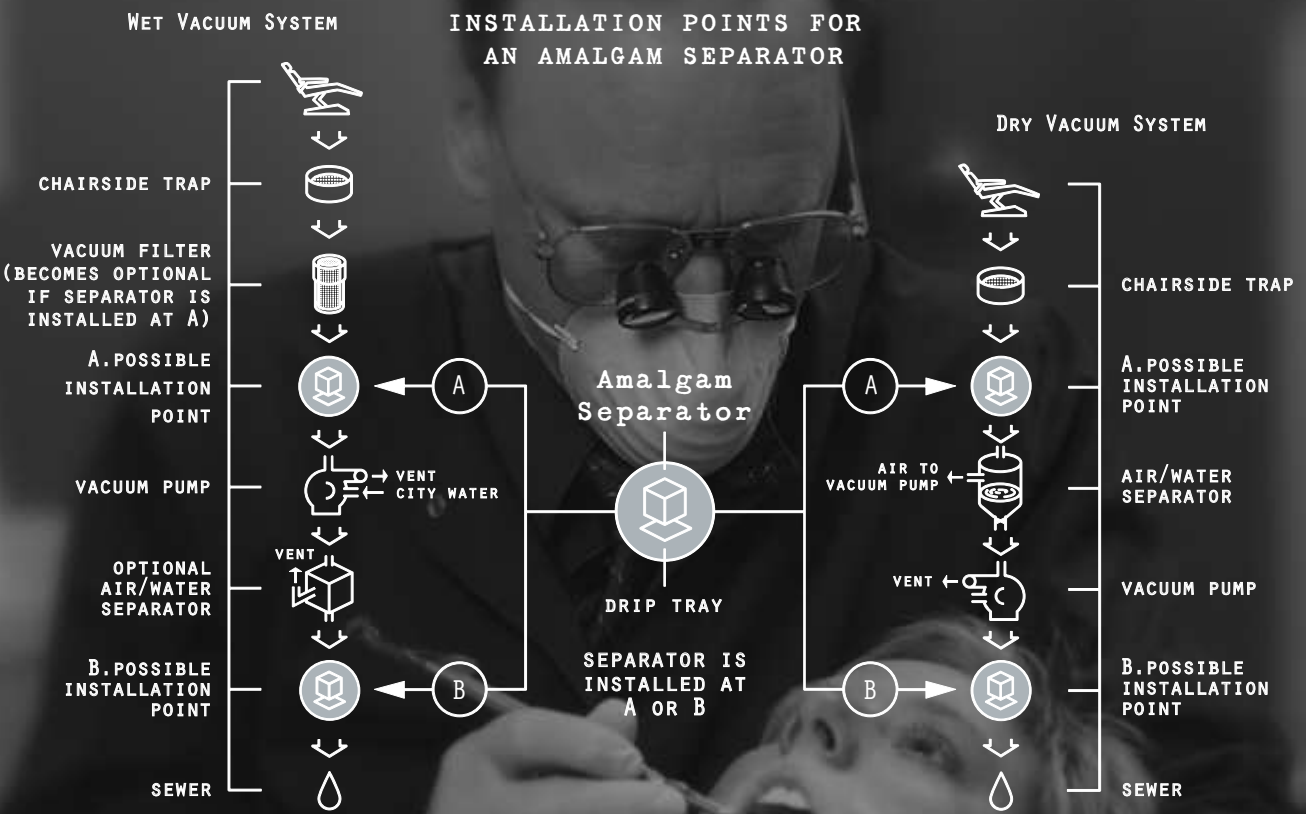
- Be exempt from meeting the 2-micrograms-per-liter Council mercury local limit.
- Be exempt from needing a Council Industrial Discharge Permit.
- Be exempt from paying Council permit fees.
- Be exempt from self-monitoring requirements (sampling and analysis).
- Be expected to maintain certification. This would include annual submittal to the Council of key information certifying that treatment of its wastewater is within the expectations of the Voluntary Amalgam Recovery Program, including ongoing operation of the amalgam separator equipment and proper management of amalgam waste.

Similarly, non-metro-area dental offices will also benefit from participating voluntarily in the amalgam recovery program before local regulatory action is initiated. Regulatory agencies throughout the state are likely to issue certificates of compliance to dental offices; however, details of these certificate programs in Greater Minnesota were not available at the time this booklet was printed.

Your commitment  
is a part of  
the solution.



re:solve



re:capture

## The amalgam separator collects particles that escape chairside traps and vacuum filters.

ON PAGE 14 OF THIS BOOKLET, YOU WILL FIND A CHART LISTING AMALGAM SEPARATORS THAT THE MINNESOTA DENTAL ASSOCIATION AND THE METROPOLITAN COUNCIL HAVE APPROVED FOR THIS PROGRAM.

EACH AMALGAM SEPARATOR REQUIRES ONGOING MAINTENANCE TO REMOVE THE COLLECTED AMALGAM.

BECAUSE INDIVIDUAL OFFICES MAY GENERATE AMALGAM AND OTHER WASTES AT DIFFERENT RATES (DUE TO THE AMOUNT OF AMALGAM PROCEDURES CONDUCTED OR USE OF "PROPHY PASTE"), THE FIRST FEW MONTHS OF OPERATION OF A SEPARATOR MAY REQUIRE FREQUENT MONITORING TO CONFIRM THAT THE COLLECTION RATES ARE CONSISTENT WITH YOUR VENDOR'S RECOMMENDATIONS.

BECAUSE THE AMALGAM SEPARATOR CAPTURES FAR MORE THAN THE VACUUM PUMP FILTER, DENTAL OFFICES WITH A WET PUMP VACUUM MAY NOT NEED TO CHANGE THE VACUUM FILTER AS FREQUENTLY OR AT ALL.

AS A PREVENTIVE MEASURE, A TRAY SHOULD BE POSITIONED BELOW THE AMALGAM SEPARATOR. THE TRAY WILL CAPTURE ANY LEAKS OR DRIPS THAT MAY OCCUR DURING THE OPERATION OR MAINTENANCE OF THE SEPARATOR.

To capture amalgam particles, amalgam separators use one or more technologies: sedimentation, filtration, centrifugation and ion exchange. All four technologies work well. However, not all amalgam separators are equally as effective. On page 14 of this booklet, you will find a chart listing amalgam separators that the Minnesota Dental Association and the Metropolitan Council have approved for this program. All of the separators in the list are affordable, especially since a typical dental office will need to install only one separator for the entire office. All have been tested by the American Dental Association and shown to remove at least 99% of amalgam particles from the wastewater.

Sedimentation technology is used in the majority of amalgam separators, sometimes along with filtration and ion exchange. Sedimentation technology relies on a settling tank in which heavy metal particles such as amalgam can settle out of the wastewater. Some separators that use sedimentation require more space than units that use other types of technology, so if space is limited, be sure to check the dimensions of the separator you're considering to make sure it will fit.

Large group practices will need to consider the costs and installation issues associated with larger-capacity units, as compared to the purchase and installation of more than one unit with lower capacity/flow rate. To determine the best approach, large offices and group practices may benefit from working closely with their dental supply company or amalgam separator vendor.

Each amalgam separator requires ongoing maintenance to remove the collected amalgam. Some units require daily decanting, while others require replacement of a filter or containment unit every 1 to 18 months, depending upon the size of collection tanks and volumes generated within the dental office. Review the chart of approved separators to determine the type and recommended frequency of maintenance required for each unit.

Most amalgam separators are compatible with both wet and dry vacuum systems, in both large and small dental offices. However, for offices with a dry vacuum system in place, check with your dental supply company to determine if an amalgam separator that relies on filtration technology is compatible with your system. The separator chart identifies the most common installation location for each amalgam separator in relation to the chair and the vacuum pump. Each dental office should confirm this information with the manufacturer or the dental supply company that is familiar with the office's vacuum system.

Because the amalgam separator captures far more than the vacuum pump filter, dental offices with a wet pump vacuum may not need to change the vacuum filter as frequently or at all. Offices should consult their dental supply company to determine whether or not a vacuum filter should continue to be used. If used primarily as a backup, the filter should still be checked on a scheduled basis.



# Here's how to identify the amalgam separator that's right for your dental office.

1. Review the list of separators approved jointly by the Minnesota Dental Association and the Metropolitan Council. You'll find this list on page 14 of this booklet. All separators in the chart have been shown to remove at least 99% of amalgam particles. Please note that this list is subject to change, as more equipment may qualify in the future. Prior to making your final decision, check for updates to this list by visiting [www.mndental.org](http://www.mndental.org) or calling the MDA office at 651-646-7454. Your dental supply company may also be able to guide you toward the most appropriate unit.
2. Answer the following questions to determine which amalgam separator will work best for your office.
  - **Does your office use a wet vacuum or a dry vacuum system?** Some amalgam separators may be compatible with one type of system, but not another. Check with your supplier for more details.
  - **How many operatories are served by your vacuum system?** Larger centralized vacuum systems serving multiple offices may require larger separator capacity or replumbing to isolate amalgam-waste lines.
  - **What is the flow rate from your operatories during "peak" flow, such as when the vacuum system is flushed at the end of the day?** Choose an amalgam separator that easily handles even your peak flow.
  - **What (if any) warranty requirements come with your vacuum system?** Check the terms of your warranty agreement to ensure that amalgam separator installation work is conducted in a way that does not void the warranty provisions.
  - **Do you lease or own your office space?** If leasing, what are the terms of your lease for maintaining and modifying vacuum, sewer line and electrical utilities?
  - **How many chairs are in your office?** The chart shows the capacity (in number of chairs served and flow rate) for each amalgam separator. Make sure you choose a separator that can handle your current and future capacity. Also, if you operate chairside cuspidors that connect to your vacuum and drain lines, these volumes need to be included when sizing a proper separator system.
  - **Do you want to install an amalgam separator at chairs where restorative work is performed, or in one central location?** The advantage to installing a central amalgam separator is that one unit will serve the entire office. Many separator systems for single offices are sized to handle 1-5 chairs. If chairs are used for hygiene work now, but may be used for general dentistry in the future, waste from such chairs should be routed to the separator.
  - **How much physical space is available for the equipment?** If you are planning to remodel your office or build a new one in the near future, you should allow adequate space for amalgam separator equipment, and install such equipment at that time.
  - **Is there suitable access to 120V AC power for your separator installation?** Some separators (utilizing pumps to remove collected wastewater) will need 120V AC power supply. Connections to existing electrical supplies should be done by a licensed electrician.
  - **Are dental personnel available to maintain the equipment?** Some separators require more staff time than others. For example, daily decanting may be necessary with a batch settling system. If no one is available for this task, then a separator that uses a different technology may be a better solution.
3. Consider the total costs, which include:
  - **Purchase or lease of the equipment.** Separators that cost less may require more hands-on management; separators that are more expensive may be more convenient to maintain. Some vendors may offer a service plan that includes maintenance of the equipment and proper amalgam waste disposal. You'll find a list of vendors on page 15 of this booklet.
  - **Installation of the equipment.** If you purchase a separator from a dental supply company, they might install the unit. Otherwise, you may need to contact a licensed plumber (a partial list of plumbers is included

on page 15). Unless there are significant plumbing or space considerations at a particular office, installation should be fairly inexpensive, taking approximately 1/2 to 2 hours of a plumber's time. Note: If you install the separator yourself, keep in mind that amalgam and mercury waste may break down copper plumbing, resulting in leaks.

- **Maintenance costs.** Annual operating costs typically range from \$300 to \$500. Amalgam separators that use filtration will require you to replace filters, and separators that use sedimentation may require the tank or canister to be replaced.
- **Recycling costs.** Depending on your location, you may have the option of delivering amalgam waste to a waste recycling facility or having the waste handler pick up the amalgam waste at your dental office. A list of recyclers is included on page 15.

**FOLLOW THESE STEPS TO INSTALL AN AMALGAM SEPARATOR.**

1. Contact a dental equipment supplier, vendor or the manufacturer of the amalgam separator. Confirm that the amalgam separator you've selected from the approved list is compatible with your system and appropriate for your office.
2. Arrange for the equipment to be delivered to the office and installed. If your vendor does not install the equipment, you may need to contact a plumber. Installation may need to take place at a time when the office is not seeing patients, so that the vacuum system will not be in use.
3. If the vendor you are purchasing or leasing your separator from will not be regularly monitoring and maintaining your unit, make arrangements with an amalgam waste handler.
4. Determine if your office will deliver or ship the amalgam waste to a facility or if a waste handler will pick up the amalgam waste.
5. If the vendor will be regularly monitoring and maintaining your amalgam separator, establish an amalgam waste handling procedure and schedule. Determine whether or not the vendor will also handle other amalgam waste from your office (e.g., chairside traps) and, if so, how that waste should be stored.
6. Confirm that you will receive documentation showing your amalgam waste has been handled correctly.

THERE ARE FOUR TYPES OF VENDORS WHO CAN HELP YOU CAPTURE AND RECYCLE AMALGAM:

- DENTAL SUPPLY COMPANIES WHO SELL AND, IN SOME CASES, INSTALL AMALGAM SEPARATORS.
- PLUMBERS WHO INSTALL THE AMALGAM SEPARATORS.
- WASTE HANDLERS WHO WILL RECYCLE THE AMALGAM THEY PICK UP AT YOUR OFFICE OR YOU DELIVER TO THEIR FACILITY.
- VENDORS WHO SELL OR LEASE THE AMALGAM SEPARATOR, MAINTAIN THE EQUIPMENT, AND PERFORM THE RECYCLING RESPONSIBILITIES FOR YOUR OFFICE.

re: view

# Proper disposal is just as important as removing amalgam from your waste stream.

## FOUR STEPS TO GOOD ENVIRONMENTAL STEWARDSHIP:

1. INSTALL AND MAINTAIN AN APPROVED AMALGAM SEPARATOR.
2. CONTACT AN AMALGAM WASTE RECYCLER ABOUT SPECIAL REQUIREMENTS FOR COLLECTING, STORING, AND TRANSPORTING AMALGAM WASTE.
3. STORE AMALGAM WASTE FROM ALL ASPECTS OF YOUR PRACTICE IN A COVERED PLASTIC CONTAINER LABELED "AMALGAM FOR RECYCLING" OR AS DIRECTED BY YOUR RECYCLER.
4. DELIVER OR ARRANGE FOR VENDOR TO PICK UP AMALGAM FOR RECYCLING ACCORDING TO THE SCHEDULE SPECIFIED BY THE MANUFACTURER OF THE AMALGAM SEPARATOR YOU HAVE INSTALLED.

The dental office generates many types of waste that require proper handling, and amalgam is only one of them. The best management practices you already have in place can easily be modified to include the proper disposal of amalgam. (For information about expanding your best management practices to handle amalgam waste, contact the Minnesota Dental Association for a free training video and brochure.)

There are many types of waste amalgam. All need to be handled and disposed of properly.

*Non-contact amalgam (scrap)* is excess mix that remains at the end of a restoration placement and has not come in contact with the patient. If this amalgam scrap is kept clean and separate from other waste, you may receive a payment from the waste handler or metals refinery.

*Empty amalgam capsules* are the containers left over from pre-capsulated dental amalgam. If all amalgam has been removed, the capsules can go into the regular trash.

The next three types of amalgam should be collected in a plastic container labeled "amalgam waste." Depending on your location, you may be able to deliver this container to a waste handler, arrange for pick-up, or ship the container to a recycling facility. If amalgam waste is to be recycled, it may be transported without restrictions.

- *Contact amalgam* is amalgam that has been in contact with patients.
- Chairside traps capture *amalgam waste* during amalgam placement or removal procedures.
- *Sludge* collects in vacuum pump filters and amalgam separator filters or tanks. The type of amalgam separator you purchase will dictate the method for removing amalgam waste from the unit.

On page 15 you will find a list of amalgam waste handlers and recyclers. When you contact a vendor, be sure to discuss the proper method of collecting, storing, and transporting the amalgam captured within your dental office. The vendor may provide more than one container so you can separate the different types of amalgam waste.

Whether you lease or own an amalgam separator, ask if the vendor will pick up all of your amalgam waste – including non-contact amalgam and waste from chairside traps – and deliver it to a fully licensed recycling facility.

Remember that your dental office, as a generator of amalgam waste, needs to limit your potential liability from improper disposal of amalgam waste by selecting a reputable recycler. The MDA does not endorse any of the amalgam waste handlers or recyclers on the list in this folder. It is your responsibility to ensure that your recycling vendor provides proper waste manifests for your waste and can document to your satisfaction that they are operating in compliance with applicable state and federal regulations.

**BEST MANAGEMENT PRACTICES FOR AMALGAM WASTE AND  
OTHER WASTE PRODUCTS:**

- Never put amalgam waste in the regular garbage.
- Never put amalgam waste in the red bag for infectious waste.
- Never rinse chairside traps or vacuum pump filters containing amalgam over drains or sinks.
- Never flush amalgam waste down the drain.
- Never pour used, untreated photographic fixer down the drain – treat fixer on-site or have your waste handler take it.
- Never throw lead x-ray foils in the garbage – recycle them.
- Utilize approved line cleansers that minimize the re-release and mobilization of mercury within your lines and traps (do not use bleach).
- Never utilize a heating method to sterilize amalgam-containing materials due to potential for mercury to “volatilize” and become airborne.
- If you use acids to clean equipment such as x-ray processors, neutralize the acid prior to sewerage, or have the acid managed by a waste handler. This will minimize the dissolving of old amalgam that may be present in plumbing lines.



re:cycle

# Now is the right time to take action.

The Minnesota Dental Association's goal for the Amalgam Recovery Program is 100% voluntary compliance. Let's prove that Minnesota dentists are willing to put their environmental concerns into action by voluntarily installing an amalgam separator.

For those who choose not to install a separator, or just don't get around to it before the deadline, government regulation will be the next step. For dentists in the metro area, regulation will be imminent. With regulation come permits, fees, inspections, and wastewater testing, all at a substantial cost. You have the opportunity now to avoid these potential costs and associated staff time by proactively installing and operating an approved amalgam separator.

Under a conventional regulatory approach, a Twin Cities area dental office could be subject to the Metropolitan Council's permitting process and could be required to take any or all of the following steps:

- Meet the Council's mercury local limit of 2 micrograms per liter.
- Apply for and acquire a Council Industrial Discharge Permit.
- Conduct baseline monitoring for 3 consecutive days.
- Be categorized as a "Significant Industrial User."
- Conduct semi-annual sampling and analysis using Council methods.
- Submit self-monitoring reports twice per year. Metals sampling typically required under industrial permits can cost hundreds of dollars, depending on your local sewer utility's requirements.
- Pay an annual permit fee based on SIU status. This fee can exceed \$500 per year.

It's in the best interest of your practice and your community to begin the process

## AMALGAM RECOVERY ACTION STEPS

- Make a commitment** to installing an amalgam separator in your dental office. To indicate your commitment, complete the Registration Form on page 16. If you believe your office is exempt from having to install an amalgam separator, complete the exemption section of the form.
- Fax or mail the Registration Form to the MDA.** You will receive a confirmation letter from the MDA, along with an Installation Form to complete and return after the separator has been installed.
- Choose the amalgam separator** that is most appropriate for your dental office.
- Make purchase or lease arrangements with your dental supply company or a vendor** who will be supplying the amalgam separator.
- Make arrangements with your dental supply company or a plumber,** if necessary, to install the amalgam separator.
- Contact a waste handler or recycling facility** to determine the best way to incorporate amalgam waste handling into your best management practices.
- Verify that your office is properly managing all types of amalgam waste.**
- Conduct employee training** on the proper maintenance of the amalgam separator and the handling of all types of amalgam waste.
- Indicate the installation date** of your amalgam separator on the Installation Form.
- Fax or mail the Installation Form** to the MDA. You will receive a confirmation letter. If your dental office is located in the metro area, you will also receive a certificate of compliance from the Metropolitan Council. Offices outside of the Twin Cities will receive acknowledgment indicating that the office is a participant in conformance with the amalgam recovery program.

# re:act

of installing an amalgam separator in your office. According to the agreement established between the MDA and the Metropolitan Council, dental offices that install an approved amalgam separator by February 1, 2005, will not be subject to current Council regulations. This may sound like a lot of time, but when you take into consideration the process of ordering and installing any type of dental equipment, it's not. Keep in mind, too, that the sooner you install an amalgam separator, the sooner you will have a positive impact on the quality of our lakes and streams.

## EXEMPTIONS

A dental office that falls into a category on the list below may apply for an exemption from the expectation that it should install an amalgam separator. The dental office would be exempt only if ALL dentists practicing at the site and using a shared vacuum system qualify for exemption.

### EXEMPTION CATEGORIES:

- A clinical site where all of the dentists are specialists who do not place or remove amalgam. Those specialists are:
  - Orthodontists
  - Periodontists
  - Endodontists
  - Oral and Maxillofacial Surgeons
  - Oral and Maxillofacial Radiologists
  - Oral and Maxillofacial Pathologists
- A clinical site where the dentist or dentists attest on a signed form that they do not place or remove amalgam.
- A site that is scheduled to no longer be used as a dental office after January 1, 2006.
- A site owned and operated by a non-profit organization, where dentists provide dental care on a voluntary basis.
- A mobile or portable dental office that can show that it is minimally engaged in amalgam placement or removal, or there are reasons why it is not practical for the mobile or portable dental office to install an amalgam separator.

## DISCLAIMER

Within the program, MDA will strive to provide accurate, timely information, including updates, to participating dentists. Each participating dental office is responsible for all performance agreed to under the program. Waste management requirements may vary by local ordinance or regulation. Participating dentists must be cognizant of their responsibility to maintain compliance with any applicable ordinance or regulation. This program is subjugated by, and should not be viewed as an alternative to, any such obligatory compliance.

THE MOST IMPORTANT STEP IS TO MAKE A COMMITMENT TO INSTALL A SEPARATOR. THE MDA AND THE COUNCIL NEED TO KNOW THAT THIS PROGRAM WILL SUCCEED.

ON PAGE 15 OF THIS BOOKLET, YOU WILL FIND VENDOR LISTS FOR DENTAL SUPPLY COMPANIES THAT SELL OR LEASE AMALGAM SEPARATORS; PLUMBERS WHO ARE FAMILIAR WITH THE INSTALLATION PROCESS OF AMALGAM SEPARATORS; AND AMALGAM WASTE HANDLERS WHO WILL RECYCLE THE AMALGAM. ON PAGE 14 YOU'LL FIND AN APPROVED AMALGAM SEPARATOR FEATURES CHART. IF YOU HAVE QUESTIONS OR CONCERNS NOT ADDRESSED IN THIS BOOKLET OR THE ACCOMPANYING MATERIALS, PLEASE CONTACT THE MINNESOTA DENTAL ASSOCIATION AT 651-646-7454.

FOR UPDATES ON THE AMALGAM RECOVERY PROGRAM, SUCH AS AN EXPANDED CHART OF APPROVED AMALGAM SEPARATORS OR VENDOR LIST, VISIT OUR WEB SITE AT [WWW.MNDENTAL.ORG](http://WWW.MNDENTAL.ORG).

# Features of Approved Amalgam Separators

Amalgam Separator	Model Number	Removal Technology	Capacity	Flow Rate Factors	Location	Physical Dimensions	Cost	Other Information
The Amalgam Collector	CH9 or CH12	Sedimentation	1 per chair	Working capacity is 2.3 liters for the CH9 and 3.7 liters for the CH 12	Chairside	Height: 9" or 12" (plus 4" for fittings) Diameter: 8"	\$495	Select height of a unit to be purchased based on your flow rate. Dental office regularly adjusts outlet tube height, decants liquid and occasionally empties the sludge waste. Canisters may be replaced or reused.
	CE18 or CE24	Sedimentation	Variable	Working capacity is 6.5 liters for the CE 18 and 9.3 liters for the CE 24	Single central location just upstream of the vacuum pump	Height: 18" (plus 4" for fittings) Diameter: 8"	\$695 for the CE18 and \$1,250 for the CE 24	
Asdex	AS-9	Filtration	1 filter unit per chair	250 ml/minute maximum flow rate	Chairside	Height: 11.5" Diameter: 3"	\$229 for the initial unit; \$79 per filter	Dental office replaces a used filter with a new filter every 4-6 weeks.
BullfroHg	BullfroHg 10	Sedimentation	6 chairs	Holding tank volume: 10 liters	Single central location just upstream of the vacuum pump	Height: 20.5" Diameter: 8.5"	\$50/month service agreement (2 year minimum contract)	120 V AC power supply needed to pump settled effluent from unit. Utilizes an automatic timer. Service fee includes recycling of amalgam waste. Unit is available in larger sizes and priced accordingly.
SolmeteX	Hg 5	Sedimentation, filtration, and chemical binding	10 chairs	50 ml/minute maximum flow rate	Single central location just upstream of the vacuum pump	Height: 29" Width: 14" Depth: 8"	\$695 for the initial unit; \$250 per filter	Filter replaced approximately every 6 months or when full. The \$250 filter purchase includes recycling. Lease plan also available (\$59.95/month) if purchased direct from manufacturer.
	Hg 10	Sedimentation, filtration, and chemical binding	10-25 chairs	Not applicable since it uses a 95 liter (25 gallon) holding tank and batch treatment	Single central location downstream of the vacuum pump	Tank Dimensions: - Height: 48" - Diameter: 25" Plus 6 filters mounted on the wall	\$7,450 for the initial unit and filter; \$1,050 for a 6-filter replacement kit; Individual filter units also available	Units are custom made to accommodate an office's flow rate. Filter kit would be replaced from quarterly to annually. 120V AC power supply needed to pump effluent through the treatment process.
Maximum Separation Systems	MSS 2000	Sedimentation and filtration	16 chairs	2.5 liters/minute	Single central location just upstream of the vacuum pump	Height: 28" Width: 18.5" Depth: 15"	\$1,395 per unit; \$165 per settling tank plus \$185 recycling fee	Initial cost includes two settling tanks, both of which would last one dentist approximately two years or two dentists approximately one year. 120V AC power supply needed.
	MSS 1000	Sedimentation and filtration	6 chairs	90 ml/minute	Single central location just upstream of the vacuum pump	Height: 24" Width: 18.5" Depth: 15"	\$968 per unit; \$165 per settling tank plus \$185 recycling fee	The MSS 1000 has one settling tank (rather than two tanks) which would last one dentist approximately one year. 120V AC power supply needed.
AB Dental Trends	Rasch 890-1000/4000	Sedimentation, filtration, and ion exchange	12 chairs	4 liters/minute	Single central location at the outlet of an air-water separator for a wet system	Height: 36" Width: 10" Depth: 13"	Approximately \$1,900 which includes an air-water separator	The Rasch 890-1000/4000 is for use with a wet vacuum pump system and the Rasch 890-6000/4500 is for a dry vacuum pump system or a wet system that does not have an air-water separator. The standard canister is typically replaced about every 18 months. Cost includes management of the waste.
	Rasch 890-6000/4500	Sedimentation, filtration, and ion exchange	12 chairs	4 liters/minute	Single central location at the outlet of an air-water separator for a dry system	Height: 6" Width: 9" Depth: 12"	\$1,330	
Rebec	RME 2000-CatchHg	Sedimentation and filtration	8 chairs	1 liter/minute	Single central location just upstream of the vacuum pump	Height: 23.5" Width: 20" Depth: 8"	\$1,895 per unit; \$395 per replaced settling tank	Cost includes processing of the waste. For 8 operatories, the settling tank would be changed out annually.

Please note: This chart has been updated since it was printed. Please refer to the Updated "Features of Approved Amalgam Separators" chart by clicking here [http://mndental.org/professionals/amalgam\\_recover/updated\\_chart/](http://mndental.org/professionals/amalgam_recover/updated_chart/)

Information in this chart has been compiled by Kevin McManus, EBI Consultants, and Peter Berglund, Metropolitan Council Environmental Services, based upon review of vendor literature and web sites, information reported within P.L. Fan, H. Batchu, H.N. Chou, D. Rakowski, W. Casparec, C.L. Miaw, and J. Sandrik, "Laboratory Evaluation of Amalgam Separators," Journal of the American Dental Association, May, 2002, pp. 577-588; information within Seattle (King County) Amalgam Separator Comparison Chart, at [http://dnr.metrokc.gov/wir/indwaste/Sep\\_Comp\\_Chart.doc](http://dnr.metrokc.gov/wir/indwaste/Sep_Comp_Chart.doc); and personal communications with vendors in December, 2002, and January, 2003. Information is believed to be correct as of the time of publication, but dentists should contact vendors to determine whether system specifications or pricing has changed. This list includes separators tested by the American Dental Association and other units that have demonstrated at least 99% amalgam removal under the ISO 11143 test protocol; however, it is not a complete list of amalgam separators on the market.

The Minnesota Dental Association provides no guarantees or warranties for the purchase, installation, or operation and maintenance of the amalgam separators listed herein.

## Vendor List

The following vendor list is provided as a resource to dentists. It is not intended to be an all-inclusive list, nor are the companies listed endorsed by the organizations involved in this program. Dentists should research available options for their particular needs.

### MANUFACTURERS OR EXCLUSIVE DISTRIBUTORS OF APPROVED AMALGAM SEPARATORS

The Amalgam Collector  
*Contact:*  
R&D Services  
8120 Greenlake Dr. N  
Seattle, WA 98103  
800-816-4995  
206-525-4995

Asdex  
*Contact:*  
American Dental  
Accessories, Inc.  
7310 Oxford St.  
Minneapolis, MN 55426  
800-331-7993  
952-939-9398

BullfroHg  
*Contact:*  
Dental Recycling North  
America (DRNA), Inc.  
145 W. 58th Street  
New York, NY 10019  
800-360-1001

SolmeteX  
*Contact:*  
SolmeteX, Inc.  
50 Bearfoot Road, Suite 2  
Northborough, MA 01532  
800-216-5505  
508-393-5115

Maximum  
Separation Systems  
*Contact:*  
Maximum  
Separation Systems  
301-1779 Sean Heights  
Victoria, BC V8M 1X6  
800-799-7147  
250-652-5279

AB Dental Trends  
*Contact:*  
AB Dental Trends  
211 Grover Street  
Lynden, WA 98264  
800-817-6704  
360-354-4722

Rebec  
*Contact:*  
Rebec  
P. O. Box 658  
Edmonds, WA 98020  
800-569-1088

### DENTAL SUPPLIERS

Marcus Dental Supply Co.  
2219 Edgewood Ave. S  
St Louis Park, MN  
55426-2822  
952-546-0688

Parsons Preferred  
Dental Inc.  
2148 44 Ave. N  
Minneapolis, MN 55412  
612-529-6880

Patterson Dental Company  
1031 Mendota Heights Road  
St. Paul, MN 55120  
651-686-1600  
800-328-5536

Sullivan Schein Inc.  
875 Blue Gentian Road  
Eagan, MN 55121-1593  
651-905-3973

### PLUMBERS

Bredahl Plumbing, Inc.  
9821 Valley View Road  
Eden Prairie, MN 55344  
763-424-2646

Commercial Plumbing  
and Heating  
24482 Greenway Ave.  
Forest Lake, MN 55025  
651-464-2988

### WASTE HANDLERS/ RECYCLERS

Amalgaway  
1002 W. Troy Ave.  
Indianapolis, IN 46225  
Ph. 800-267-1467  
317-784-2719

Bethlehem Apparatus C.  
890 Front St., PO Box Y  
Hellertown, PA 18055  
610-838-7034

Century Metals  
P.O. Box 5815  
Trenton, NJ 08638  
609-883-0318

DeBoer Recovery  
2055 Fordbush Road  
Ft. Plain, NY 13339  
518-568-5299

Dental Recycling  
North America  
145 W. 58th St. #8C  
New York, NY 10019  
800-360-1001

D.F. Goldsmith  
909 Pitner Ave.  
Evanston, IL 60202  
847-869-7800

Dorrell Refinery  
533 Atlantic Ave.  
Freeport, NY 11520  
800-645-2794

Envirochem  
21821 Industrial Blvd.  
Rogers, MN 55374  
763-428-4002

Maguire & Strickland  
Refining, Inc.  
1290 81st Ave.  
Minneapolis, MN 55432  
800-486-2858  
763-786-2858

Mercury Waste Solutions, Inc.  
2007 West County Road C-2  
Roseville, MN 55113  
651-628-9370

Onyx Environmental Services  
W 124 N9451 Boundary Road  
Menomonee Falls, WI 53051  
800-255-5092

Premier Dental  
325 Armour Ave.  
South St. Paul, MN 55075  
651-453-0225

Safety-Kleen Corp.  
9261 Isanti St. NE  
Blaine, MN 55449  
763-780-1332

Stericycle, Inc.  
28161 N Keith Ave.  
Lake Forest, IL 60045  
800-355-8773



# Voluntary Dental Office Amalgam Recovery Program Registration Form

Make a commitment to installing an approved amalgam separator in your dental office as quickly as possible. The sooner you act, the sooner you will have a positive impact on the quality of our lakes and streams.

## 1 DENTAL OFFICE CONTACT INFORMATION

Office Name \_\_\_\_\_

Type of Clinic       General Dentistry    Endodontic      Oral  Surgery

Orthodontic       Periodontic       Prosthodontic       Multi Specialty

Responsible Dentist \_\_\_\_\_

Contact Person (if different) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_ E-mail \_\_\_\_\_

## REGISTER YOUR COMMITMENT

**Deadline: July 2003**

If your dental office site wishes to participate in the "Volunteer Dental Office Amalgam Recovery Program" and commits to installing an approved amalgam separator, please sign here:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

After you submit this registration form, you will receive a confirmation letter and an Installation Form to return when the amalgam separator equipment is installed and operating within your dental office. Once the equipment is installed, you'll receive your certificate of compliance.

## 2 OR

### REQUEST AN EXEMPTION

A dental office that meets the criteria listed on page 13 under Exemption Categories may qualify for an exemption to this voluntary program. If you believe your dental office qualifies for an exemption, please sign here:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type of exemption

Please submit this form to the Minnesota Dental Association at 2236 Marshall Ave., Suite 200, St. Paul, MN 55104, or fax it to 651-646-8246.

For general information about the Voluntary Dental Office Amalgam Recovery Program, visit [www.mndental.org](http://www.mndental.org).

re: amalgam  
recovery

Minnesota Dental Association  
2236 Marshall Avenue, Suite 200  
St. Paul, Minnesota 55104

651 646-7454 toll free: 800 950-3368  
fax: 651 646-8246

[www.mndental.org](http://www.mndental.org)