Sample Newsletter Articles About Amalgam

The following are a representative series of articles about dental amalgam issues. These sample articles have proven to be useful tools for introducing pollution prevention issues at the start of local dental office outreach programs. Feel free to edit the articles to suit your needs, and publish them on your website or perhaps via the newsletter of your local dental society. We would appreciate hearing about any improvements that you make.

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[1] Announcing A Professional Outreach Program
Environmentally Responsible Dentistry

By Tom Barron, Civil Engineer (tsbarron@attglobal.net), and Vern Bessey, San Mateo Public Works (*vbessey@cityofsanmateo.org)*

In Brief

The City of San Mateo is obligated by its sewer system operating permit to discuss pollution prevention practices with local businesses.

As part of this outreach effort, engineering representatives of the Public Works Department will be visiting each dental practice in San Mateo and Foster City.

These on-site consultations are brief and confidential, and are a public service covered by the sewer fees that your office pays. The visits will be by appointment , and scheduled at a time that is convenient to your office.

What topics do we cover?

The primary focus of these consultations will be proper management techniques for amalgam, X-ray, and sterilant wastes that your office generates throughout the year. Information will also be provided about chemical products commonly used in dentistry, and about alternative waste storage and disposal practices.

More Information?

This outreach project is jointly sponsored by City of San Mateo Department of Public Works, Foster City, and the San Mateo County Dental Society.

For more information visit:<http://www.cityofsanmateo.org/dept/pubwks/dental.html>, or call Vern Bessey at (650) 552-7342.

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You may also wish to visit websites sponsored by the California Dental Association, and by other sewer agencies in the San Francisco Bay Area.

[2] Recommendations for Amalgam Waste Management
Environmentally Responsible Dentistry

By Tom Barron, Civil Engineer (tsbarron@attglobal.net), and Vern Bessey, San Mateo Public Works (*vbessey@cityofsanmateo.org)*

In Brief: Mercury contained in waste amalgam particles that enter the sewer is creating an environmental problem that we need to address. A joint team of CDA, SMCDS, and local sewer agency staff are working together to solve this problem. You can help this effort by simply collecting and recycling all of your waste amalgam, including non-contact scrap, empty capsules, and vacuum system traps.

Your Local Sewer System
The City of San Mateo sewer system serves dental offices in San Mateo and Foster City. The system includes a treatment plant that removes pollutants before the wastewater is discharged to San Francisco Bay.

Federal and state agencies are requiring San Mateo and other local sewer dischargers to reduce their mercury releases into the environment. Regional efforts are being made to capture mercury from cinnibar and gold mining runoff.

How Much Mercury?
Engineering calculations indicate that dental amalgam is a major contributor to the mercury load received by the sewer system. For example, about half of the 13 pounds per year of mercury reaching the San Mateo treatment plant headworks is believed to come from amalgam released by dental offices. [1]

How Does Mercury from Dental Amalgam Reach The Environment?
Dental practices release mercury to the environment in several ways – primarily during the removal and placement of amalgam fillings, and the extraction of teeth containing such fillings. Additional releases can occur from spills or broken mercury storage bottles (e.g., in older trituration systems).

These amalgam releases occur in: 1) discharges to the sewer system, 2) trash bound for landfills, and 3) biohazard wastes destined for incineration.

Based on research studies conducted by the US Navy, biological activity in the sewer system releases mercury from amalgam. This conversion, called methylation, makes the mercury bioavailable and more toxic compared to when

it is held in the amalgam. This conversion can also occur in creek and wetland sediments, landfills, and other parts of the environment. [1,2]

How You Can Minimize Your Amalgam Waste Releases

Dental professionals can minimize their mercury amalgam releases by using the following Best Management Practices (BMPs) that the CDA/SMDS/sewer agency team developed. These practices are also recommended by the ADA.

a. Non-contact amalgam scrap should be placed in a small plastic jar located in each operatory. A recycling service should periodically pick up these containers (and furnish you with empty ones).

b. When you take out chairside vacuum line traps, do not rinse them in the sink. Place the entire plastic trap (uncleaned) into a large amalgam-mercury recycle container that is located in your lab or storage area. Do the same with the filter or screen at the central vacuum unit, and with the disposable cuspidor trap.

c. Place empty amalgam capsules into the same recycling container as the vacuum line traps.

d. Avoid vacuum line cleansing solutions that contain bleach. Such cleaners will dissolve and release mercury from trapped amalgam in the lines, thereby adding to wastewater contamination. In a later article we'll provide a list of non-bleach vacuum line cleansers.

e. Some extracted teeth contain amalgam fillings. Disinfect these teeth, and then place them in the vacuum trap waste container. Do not dispose of this amalgam in your biowaste containers, as these will be incinerated thereby sending mercury into the air.

f. If appropriate, install a clear plastic bottle trap under each operatory sink to capture amalgam that inadvertently falls into the sink. Empty this trap into the container of used vacuum line traps.

g. ADA has tested amalgam separators for installation in vacuum systems. These devices increase the waste amalgam recovery to over 95%, compared to perhaps 50% for the coarse traps and screens that are normally found in such systems. Consider such a unit if you want to get ahead of the game; they are not yet being required in the service area.

h. If possible, do not use cuspidors that drain amalgam wastes directly into the sewers. Cuspidors linked to the vacuum system will at least go through the vacuum traps.

i. Do not mix amalgam, fixer, and lead foil wastes together. Doing so makes recycling very difficult if not impossible.

Notes and References

This article has been adapted with permission from an earlier edition in the June 2002 Southern Alameda County Dental Society Explorer, that was written by Dr. Steven C. Fong, DDS.

[1] The work of Dr. Mark Stone, DDS, and other Naval researchers is available at: http://www.dentalmercury.com/publication.html

[2] Charles N. Alpers and Michael P. Hunerlach**,** Mercury Contamination from Historic Gold Mining in California, USGS Fact Sheet FS-061-00 http://ca.water.usgs.gov/mercury/fs06100.html

This article is part of an outreach project jointly sponsored by City of San Mateo Department of Public Works, Foster City, and the San Mateo County Dental Society.

For more information: <http://www.cityofsanmateo.org/dept/pubwks/dental.html>, or call Vern Bessey at (650) 552-7342. You may also wish to visit websites sponsored by the California Dental Association, and by other cities in the San Francisco Bay Area.

[3] Regulations for Managing Your Amalgam Wastes

Environmentally Responsible Dentistry

By Tom Barron, Civil Engineer (tsbarron@attglobal.net), and Vern Bessey, San Mateo Public Works (*vbessey@cityofsanmateo.org)*

In Brief: During our outreach visits, several of you have asked about the regulations that apply to managing your amalgam wastes. This article highlights what is required in the San Francisco Bay Area.

What are the legal requirements for amalgam wastes?

The State of California considers scrap amalgam and amalgam particles contained in capsules, traps, and screens to be a hazardous waste unless it is recycled to recover the metals that it contains. For details, see: http://www.dtsc.ca.gov/PublicationsForms/FS_DutyOfficer_DocVet.pdf

This ruling means that it is not legal to place amalgam scrap, or capsules, traps, and screens containing amalgam particles in the trash, plastic recycle bin, medical waste bag, or sink.

Therefore, you have only three alternatives for legally disposing of your amalgam wastes. The amalgam must be:

- shipped via manifest to a secure disposal site by a licensed hazardous waste hauler;

- picked up by or sent to a metals recycler; or

- taken to a County hazardous waste collection site.

Dentists who choose the first alternative must become a permitted hazardous waste generator, ship their amalgam via a hazardous waste manifest, and obtain confirmation of proper disposal from the destination.

On the other hand, dentists who chose to recycle waste amalgam need not obtain a permit, nor must they use hazardous waste shipping manifests. A simple receipt from the recycling firm indicating that the amalgam is being recycled is sufficient. In general, the same process applies to your fixer and lead foil wastes.

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[4] Storing Your Amalgam & Photo/X-Ray Wastes
Environmentally Responsible Dentistry

By Tom Barron, Civil Engineer (tsbarron@attglobal.net), and Vern Bessey, San Mateo Public Works (*vbessey@cityofsanmateo.org)*

In Brief: How should you collect and store your metal-containing wastes? We asked contractors who recycle these materials and found out that:

- Photo / X-ray fixer, amalgam, gold, and lead foils should each be stored in their own separate waste containers.

- If you routinely place amalgams, then you should have a small container at each trituration unit for the non-contact scrap amalgam waste. In addition, your practice needs to have one large waste container for mercury-bearing traps, screens, extracted teeth, etc.

- If you do not place amalgam restorations, your practice only needs to have the one large waste container for amalgam-containing traps, screens, extracted teeth, etc.

Storing Your Amalgam & X-Ray Photo Wastes

The following table identifies steps you can take to easily and legally recycle the amalgam wastes your practice generates. Similar steps are listed for photographic fixer solution and x-ray lead foils.

It's important to segregate your waste streams. Mixing fixer with amalgam, or used lead foils with amalgam makes it significantly harder to recycle the metals. In fact, your recycling contractor may refuse to take the mixed waste, at which point it will have to be disposed of as hazardous waste.

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Guidelines for Dental Waste Management

Waste	Store In	Send To
Scrap Amalgam (non-contact mixing scrap) 	If you routinely place amalgam restorations, collect unused mixing excess in a small plastic bottle kept at each operatory. Keep dry – do not add fixer or water to the container. Label as 'Non-contact scrap amalgam – contains mercury for recycling'.	Mercury / amalgam recycler or Take to County VSQG
Amalgam in Empty Capsules, Screens, & Traps 	Collect in one large plastic container kept in lab or other convenient work area. Do not pre-wash or disinfect. Also, keep dry – do not add fixer or water to container. Label as 'Amalgam waste with other materials – contains mercury for recycling'.	Mercury / amalgam recycler or Take to County VSQG
Amalgam in Extracted Tooth	Disinfect tooth and place in same plastic bottle as capsules, screens, & traps,	Mercury / amalgam recycler
Used Fixer	Place in empty fixer bottle or similar plastic container. Label as 'Used fixer - contains silver for recycling'.	Silver recycler or Take to County VSQG
Used Lead Foils 	Place in a separate plastic bottle or container. Label as 'Used photographic plate - contains lead for recycling'.	Lead recycler or Take to County VSQG

Amalgam, fixer, and lead wastes should be stored in plastic bottles or other sturdy, water-tight containers. Do not use glass jars, soft drink bottles, or food containers. Do not mix any of these wastes in the same container – doing so may make recycling impossible. VSQG = Collection events for "Very Small Quantity Generators" of hazardous wastes that are available to businesses in San Mateo County. Call (650) 599-1071 or e-mail <djcasey@co.sanmateo.ca.us>.

[5] Advanced Amalgam Separators
Environmentally Responsible Dentistry

By Tom Barron, Civil Engineer (tsbarron@attglobal.net), and Vern Bessey, San Mateo Public Works (*vbessey@cityofsanmateo.org)*

In Brief: Modern high-speed dental instruments create very fine waste particles when an old amalgam filling is removed. These particles are mostly picked up in the high speed suction, with lesser amounts swallowed by the patient, or expectorated into the chairside cuspidor if the operatory has one (the latter are used in about 20% of the dental operatories that we see).

Standard traps and screens in the vacuum system and cuspidor remove only 50% - 60% of the waste amalgam; while the remainder passes through and is discharged to the sewer. According to the ADA, advanced separator devices installed in the vacuum system will remove up to 95% of this waste amalgam. [1]

Vacuum System Separators

There are 3 kinds of generally available amalgam separators. Centrifuges are a fourth type of separator, but are not common in our area. [2]

Avprox - Filter

1. Filter – Fine mesh cartridges mounted either chairside or in the vacuum room remove particles too small for screens to catch. These units work for both wet and dry vacuum systems.

2. Settlement Chamber – Dry vacuum systems already have a settlement chamber. A similar tank can be installed on a wet system. In both cases it is important to assure that the chamber does not drain to the sewer. Instead, particles should be allowed to accumulate in the chamber, and then be pumped out by your amalgam recycling contractor.

R&D Services - Settlement

SolMetex – Ion Exchange

3. Ion Exchange Resin – Traps, screens, and the above two devices only collect particulate wastes. Absorbtion onto an ion exchange resin serves to capture dissolved mercury before it leaves the

vacuum system. These units may require a new vacuum pump with enough pressure to pull (or push) the waste stream through the resin.

Which of These Separators Is Best For You?

The following table lists questions you need to answer when evaluating amalgam separators for your vacuum system. Some of the answers are available in the ADA report [1], while others you can get from the vendors who make this equipment [2], or from the Naval Dental Research Institute website. [3]

What You Need To Know

Issue	Preferred Response	Comments
Type	Separator works with the type of vacuum system that you have	Check with vacuum system supplier to see what works for your equipment.
Cost	Reasonable cost to buy, install, and maintain	Settlement chambers & filters cost the least, while ion exchange units are more.
Reliability	Unit works reliably	Maintaining suction is a critical requirement
Size	Fits within utility room with vacuum pump	
Noise	Does not add significant noise compared to existing vacuum turbine	
Convenience	Unit is easily serviced by vendor or a local waste management contractor	
Electricity	Needs no power, or uses the same 110v that is already available	

[1] The American Dental Association has reported the results of their tests on these systems at: http://www.ada.org/prof/pubs/jada/index.asp

[2] A list of separator vendors appears in this website created by the City of San Francisco: http://sfwater.org/files/factsheets/approved_separators_list_031705.pdf

[3] The US Navy website is: http://www.dentalmercury.com

Amalgam Waste Vendors

Environmentally Responsible Dentistry

By Tom Barron, Civil Engineer (tsbarron@attglobal.net), and Vern Bessey, San Mateo Public Works (vbessey@cityofsanmateo.org)

In Brief: We are frequently asked for the names and addresses of amalgam recycling services in the San Francisco area, and of companies that manufacture amalgam separator devices for sinks and vacuum lines.

We offer the following lists with the understanding that the included firms are not endorsed by the authors or the agencies for whom they work. Also, exclusion from the list does not imply anything negative about a firm or service.

Amalgam Recycling Services

These companies accept amalgam wastes for recycling. Most, but not necessarily all of the firms will also accept used screens, empty capsules, extracted teeth, filters, and traps containing amalgam. In addition, some amalgam separator vendors provide either a pick-up or shipping service for waste amalgam captured by their equipment.

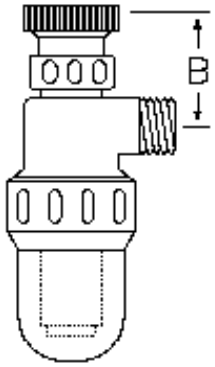
Local

National

Prepare a local and national list that is appropriate for your situation.

Under-Sink Bottle Traps

Removable bottle traps replace the “P” trap found under most sinks, and are more effective in collecting waste amalgam particles that accidentally enter the sink.



Courtesy of Zurn Industries