

Business Pollution Prevention Program

Dental Industry



Thurston County
Hazardous Waste Program

September 2006



Acknowledgments

Thurston County Board of Health

Cathy Wolfe, District One
Diane Oberquell, District Two
Robert N. Macleod, District Three
Patti Swanson, Clerk of the Board

Public Health and Social Services Department

Sherrri McDonald, RN, MPA, Director, Thurston County Public Health and Social Services Department
Diana T. Yu, MD, MSPH, Health Officer

Fieldwork and report writing was conducted by Brad Zulewski (Thurston County).

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The Thurston County Hazardous Waste Program serves small businesses in Thurston County and the communities of Bucoda, Lacey, Olympia, Rainier, Rochester, Tenino, Tumwater, and Yelm.

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Thurston County Public Health and Social Services Department
Environmental Health Division
2000 Lakeridge Drive SW
Olympia, WA 98502-6045
Phone 360-754-4111
TDD Line 360-754-2933
Fax 360-754-2954
Website <http://www.co.thurston.wa.us/health/welcome.html>

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Introduction

Thurston County Environmental Health (TCEH), a division of the Public Health and Social Services Department, conducted a technical assistance campaign for the dental industry. The campaign was funded by solid waste tipping fees and a grant from the Washington State Department of Ecology.

Dentists were identified as good candidates for technical assistance due to recently updated waste disposal regulations as well as the variety of potentially hazardous wastes that are generated by dental facilities. Wastes such as silver-containing x-ray chemicals, scrap mercury amalgam, chair-side sink traps, and vacuum pump filters all contain heavy metals that must be managed properly. Heavy metals are toxic to humans and do not readily break down in the environment. Additionally, past technical assistance efforts for other medical industry sectors identified significant rates of noncompliance regarding the management of spent x-ray chemicals. Specifically, those facilities utilizing onsite silver recovery systems for the treatment of spent fixer solutions were found to have higher rates of noncompliance due to inadequate system maintenance.

In August 2005, the Washington State Department of Ecology (Ecology) enacted new regulations requiring dental facilities to properly manage heavy metal wastes by installing specific types of equipment. These new regulations were part of a Memorandum of Understanding (MOU) with the Washington State Dental Association (WSDA) and Ecology (**Appendix A**). The MOU detailed a variety of Best Management Practices (BMPs) related to proper waste management procedures, all of which were mandated on August 1st, 2005. With generous assistance from Ecology, TCEH designed the technical assistance effort largely based on these new state-wide requirements.

In the summer of 2005, TCEH identified all dental-related facilities in the county. Once the list of potential businesses was completed, TCEH contacted each business with an offer of free technical assistance. The technical assistance effort took place during the fall of 2005 through the spring of 2006. The focus of the campaign was to educate business owners about the new Ecology regulations, ensure compliance with Article VI of the Thurston County Sanitary Code (also known as the Nonpoint Source Pollution Ordinance, **Appendix B**), reduce hazardous waste generation, and to improve overall waste management practices.

The Nonpoint Source Pollution Ordinance is based on the framework of the Washington State Dangerous Waste Regulations. This regulation is found in Chapter 173-303, Section –090 of the Washington Administrative Code. This section of the state regulation characterizes dangerous wastes (hazardous materials) as those solid wastes that exhibit any of the following characteristics.

- a. Ignitability: a fire hazard. Generally, a material with a flash point less than 60°C (140°F).

- b. Corrosivity: a solid or liquid with a pH of less than or equal to 2.0 or greater than or equal to 12.5.
- c. Reactivity: a material that reacts violently with water, generates toxic gases when mixed with water, is capable of detonation or explosive reaction if heated under confinement, or is capable of detonation or explosive reaction at standard temperature and pressure.
- d. Toxicity: a material that causes local or systemic detrimental effects in an organism, including asphyxiation, irritation, allergic sensitization, systemic poisoning, mutagenesis, teratogenesis, and/or carcinogenesis.

The businesses included in this campaign are classified as Small Quantity Generators (SQG) of hazardous wastes. Small Quantity Generators (as defined in WAC 173-303-070) may not generate more than 220 pounds of hazardous waste per month or batch, and may not accumulate or store more than 2,200 pounds at any time. Thurston County regulates only those businesses with SQG status, while the Washington State Department of Ecology regulates businesses with Medium Quantity Generator (MQG) and Large Quantity Generator (LQG) status.

Goals

The Business Technical Assistance and Education Campaign is an element of the Thurston County Business Pollution Prevention Program. Success of the technical assistance and compliance elements of the Business Pollution Prevention Program are measured by goals established in the 1998 Hazardous Waste Plan for Thurston County. The goals are:

1. Protect ground water, surface water, soils, sediments, and private property from hazardous materials and hazardous waste contamination.
2. Increase the rate of waste reduction, which conserves resources and reduces demand for disposal and recycling services.
3. Increase the percentage of hazardous waste collected (that cannot be prevented through waste reduction in the first place).
4. Reduce the amount of hazardous materials that is improperly stored, improperly disposed, and accidentally spilled into the environment.
5. Reduce damage to collection and transfer vehicles, and disposal equipment, and reduce disruption of treatment facilities by ensuring hazardous waste is kept out of these facilities or systems.
6. Reduce potential for causing publicly owned facilities such as landfills or sewage treatment plants to exceed pollutant discharge limits.

Methodology

On August 1st, 2003, Ecology and WSDA entered into a MOU regarding the proper management of dental waste. The purpose of the MOU was to reduce the amount of

heavy metal waste being discharged into local municipal sewer systems and onsite septic systems. The MOU addressed the effective management and disposal of mercury in order to ensure compliance with existing waste regulations and to protect the environment. Through mutual discussions, WSDA and Ecology determined common objectives that would be most likely to be achieved by implementing the following BMPs:

- 1) Install, use, and maintain International Standards Organization (ISO) certified amalgam separators.
- 2) Collect all amalgam waste and dispose separately. No mercury or other dangerous wastes are to be disposed with solid waste or infectious “red bag” wastes.
- 3) Properly manage and dispose of all other dangerous waste streams (e.g. x-ray waste, lead foil/aprons).
- 4) Properly dispose of all scrap amalgam waste from traps, filters, and separators using a licensed treatment, storage, disposal, or recycling facility.
- 5) Keep amalgam out of sinks and never rinse amalgam waste down the drain.
- 6) Clean or replace chair-side traps on a regular schedule and properly dispose of amalgam waste.
- 7) Clean vacuum pump filters regularly, according to the manufacturers recommendations.
- 8) Maintain all disposal records on site for three (3) years.

Under the terms of the MOU, dentists were given a two year voluntary compliance period regarding the above BMPs. During that time, Ecology developed a reporting system and sent surveys to dental facilities in order to establish a baseline level of BMP implementation. At the end of the voluntary compliance period (August 1, 2005) all dental facilities would be held accountable by Ecology to implement the BMPs.

In order to give the dental community ample time to implement the required BMPs, TCEH began planning the technical assistance effort after the voluntary compliance period expired. While working closely with Ecology staff, TCEH obtained valuable information regarding the compliance status of local dental facilities.

In addition to the recent regulatory changes enacted by Ecology, dentists were identified as good candidates for technical assistance due to the variety of potentially hazardous wastes that are generated as a result of daily operations, primarily mercury and silver. As mentioned above, mercury and silver are toxic, persistent heavy metals that do not readily degrade in the environment. This lack of degradation can also potentially cause heavy metals to accumulate to high levels in the environment as well as the human body. As a result, the Lacey, Olympia, Tumwater, Thurston (LOTT) Wastewater Alliance, Olympia’s wastewater treatment facility, limits mercury discharges to 0.05 parts per million (ppm) and silver discharges to 0.2 ppm in wastewaters. Similarly, heavy metal waste must never be disposed into onsite septic systems.

Data collected from past technical assistance efforts by Ecology and TCEH further confirmed the need for additional technical assistance for the medical industry. TCEH found that medical industry sectors had significant rates of noncompliance regarding the

management of spent x-ray chemicals. Specifically, those facilities utilizing on-site silver recovery systems for the treatment of spent fixer solutions were found to have higher rates of noncompliance due to inadequate system maintenance. Additionally, Ecology learned that some dental facilities frequently dispose of scrap amalgam by mixing with regular trash or biohazardous waste. These wastes are commonly disposed in a landfill or incinerator, which has the potential to release mercury into the air or groundwater. Thus, scrap mercury must be managed separately and disposed using the appropriate technology.

The campaign began by assembling a list of all dental facilities based on information gathered from Washington State Department of Health – Radiation Protection Division, Thurston County Public Health and Social Services, as well as local telephone directories. Utilizing these resources, TCEH identified 99 initial sites for technical assistance.

Beginning in September 2004, an invitation letter ([Appendix C](#)) was sent to the businesses selected for the campaign. The letter announced the upcoming campaign and explained the details of the technical assistance visits and compliance audits. A brief history of the Ecology MOU and the Business Pollution Prevention Program was also included. Businesses were then contacted approximately one week later to schedule a site visit. Site visits were conducted during the fall of 2005 through the spring of 2006.

For participating businesses, a commercial parcel inventory form ([Appendix D](#)) was used to collect information about a business' source of drinking water, volume of chemical products on site, solid waste and wastewater disposal, floor drains, historical land use, hazardous waste generation, and spill/emergency response preparedness. The form contained questions regarding mercury waste management, silver recovery equipment, as well as other industry-specific topics.

An on-site assessment of hazardous waste management was performed as a component of the technical assistance visit. The assessment looked at hazardous materials used by each business and verified compliance with Ecology and Thurston County regulations. County staff also utilized the opportunity to suggest other voluntary BMPs. BMPs are non-regulated practices designed to reduce generation of hazardous waste, use less-toxic products, recycle, and make improvements in housekeeping and hazardous waste management. Each business received an educational computer CD-ROM ([Appendix E](#)) that contained updated state and county regulatory information as well as other recommended BMPs.

The CD-ROM format was chosen over paper copies due to the large volume of material presented. In order to view the CD-ROM quickly and conveniently, the information was organized by subject matter and utilized a descriptive table of contents, which had direct links to the material by simply clicking on the title. This format allowed the material to be stored on multiple computers, but could also be printed for training manuals, safety meetings, etc.

After the technical assistance visit took place, the business representative was notified as to whether their business was in compliance with the Ecology regulations and the Thurston County Sanitary Code. Businesses meeting these requirements were issued a Notice of Compliance (**Appendix F**). Businesses that were not in compliance were issued a Notice of Non-Compliance (**Appendix G**) and given a mutually agreed upon time frame in which to correct the problem(s). If the problem(s) was corrected, a Notice of Compliance was issued during a follow-up visit.

A customer survey (**Appendix H**) along with a self-addressed stamped envelope was also given to each business participating in the campaign. The survey asked businesses to describe any changes they had made in their hazardous waste management practices as a result of the campaign. It also asked businesses how they find out about hazardous waste management, how useful they found the campaign, and their impressions on the quality of service provided by Thurston County's Business Pollution Prevention Program.

Follow-up calls or site visits were conducted several weeks after the initial visit to evaluate the implementation of voluntary BMPs. Since BMPs are not considered compliance issues, businesses were given educational information and recommendations. The list of recommended BMPs is located in **Appendix I**.

Results

A total of 99 sites were initially identified for technical assistance. Of the original 99 sites, 72 received technical assistance visits. Twenty-seven (27) of the 99 initial sites were not visited for the following reasons:

- 1) Fifteen (15) did not generate hazardous waste (i.e. used digital x-ray, no amalgam used, orthodontics only, etc).
- 2) Eight (8) could not be located or did not respond to attempted contacts.
- 3) Two (2) were in the process of closing or relocating.
- 4) Two (2) sites were already visited by Ecology.

Of the 72 businesses receiving site visits, 22 (31%) were already in compliance with state and county regulations at the time of the initial visit, while 50 (69%) were not. At the end of the campaign, 70 businesses were in compliance, while two (2) were pending compliance. An additional 50 follow-up visits were completed for those not in compliance, resulting in 122 total site visits. Compliance summaries are listed below in **Table 1**. The specific issues resulting in noncompliance are listed in **Table 2**.

Table 1: Compliance Results

Compliance Status	At the Time of the Initial Visit	At the End of Campaign
In compliance	22	70
Out of compliance	50	0
Pending compliance	N/A	2

Table 2: Compliance Issues

Compliance Issue	At the Time of the Initial Visit	At the End of Campaign
No secondary containment	14	0
No amalgam separator	4	1
Inadequate silver treatment system	33	2
Improper disposal into sewer system	2	0
Improper disposal into septic system	6	0
Improper lead disposal	4	0
Improper amalgam disposal (biohazard)	19	1
Improper amalgam disposal (trash)	11	0
Inadequate waste disposal documentation	42	0
Total Issues	135	4

Current Trends in the Dental Profession

As mentioned above, various information was collected about individual businesses utilizing the commercial parcel inventory form. After the initial inspections were completed, several trends were identified regarding wastewater treatment and hazardous waste disposal. These trends are listed below in **Table 3, Table 4, and Table 5.**

Table 3: General Dental Facility Trends

Sites utilizing public sewer system for wastewater disposal (LOTT)	65
Sites utilizing septic systems for wastewater disposal	7
Sites not using mercury amalgam (composite only)	16
Sites planning to decrease the use of amalgam in the future	37

Table 4: Amalgam Management/Disposal Trends

Sites using vendor pick-up services for amalgam disposal	31
Sites using drop-off/mail away waste disposal services	14
Sites using vendor for amalgam separator maintenance	55
Sites accumulating amalgam onsite (no current disposal vendor)	13

Table 5: X-ray Waste Management Trends

Sites using vendor pick-up services for waste disposal	15
Sites using local drop-off waste disposal services	18
Sites using silver recovery systems	34
Sites using vendor for silver recovery system maintenance	22
Sites upgrading inadequate silver recovery systems to meet current regulations	18
Sites removing inadequate silver recovery systems for proper off-site vendor disposal	14

Disposal Options for Spent X-ray Fixer

Spent x-ray fixer contains approximately 3000-5000 ppm silver. Since silver is a toxic, persistent heavy metal, it must be managed properly in order to protect human health and the environment. Managing silver-bearing waste is unique because, unlike most hazardous waste, silver is also a valuable commodity. As a result, there are several waste disposal options and technologies that allow a business to recycle the silver, rendering the remaining liquid non-hazardous:

- 1) **Onsite Silver Treatment:** For businesses generating larger quantities of silver waste, installing a silver recovery system may be a good option. These systems remove silver from solutions utilizing chemical recovery cartridges (CRCs) and produce a non-hazardous liquid that can be discharged to a municipal sewer system. A refining company may then process the spent CRCs and recover the raw silver. However, due to startup costs, refining fees, and required maintenance, these systems may not be economical for businesses producing small quantities of silver-bearing waste.
- 2) **Waste Pick-up Services:** Businesses also have the option of utilizing a waste disposal pick-up service. There are several local companies that transport waste offsite for silver refining. This method does not require expensive equipment or maintenance and eliminates the potential for equipment failure, which can result in wastewater discharge violations. However, ample storage space is required for waste containers, as well as adequate secondary containment for spill prevention. Additionally, since some hazardous waste vendors specialize in larger shipments, it may not be economically feasible to transport small quantities.
- 3) **Using Another Local Business for Disposal:** Since silver recovery systems are also utilized by commercial photo developers and many other medical facilities, a business may accept silver waste from other businesses for proper treatment. This is a good option for those who generate a small quantity of waste.

Free Local Silver Recycling

Don's Camera, a commercial photo processor in downtown Olympia, utilized a silver recovery system for treatment of their processing wastes. For many years, Don's Camera extended their treatment capabilities and offered free waste disposal services to approximately 15 dental facilities and numerous other medical offices. Unfortunately, Don's Camera stopped this service in January of 2006. At that time, the only other free disposal site was at The Evergreen State College (Evergreen). In 2004, the Evergreen Photography Department began offering free silver treatment services, which was facilitated by TCEH during another technical assistance campaign for medical offices. Evergreen still gladly offers this service, however, their distant location makes this option inconvenient for some dental facilities.

After conducting numerous site visits, it was apparent that most dental facilities produced approximately 1-2 gallons of silver-containing x-ray waste per month. Due to the small quantity of waste, silver recovery systems and waste pick-up services were found to be potentially costly and/or inconvenient for many dental facilities. As noted above, it was also observed that 34 (47%) dental facilities were utilizing improper silver recovery systems. Due to the unusually high rate of non-compliance, TCEH began researching alternative disposal methods. Based on past technical assistance efforts, TCEH discovered that approximately 30-40 local businesses have utilized Don's Camera, with the potential for many additional customers.

In March of 2006, TCEH decided to research new disposal options for x-ray fixer. While conducting past technical assistance efforts, county staff discovered that the majority of commercial silver recovery systems used by local businesses are sold by Hallmark Refining, Inc (Hallmark). Hallmark installs and maintains silver recovery systems for virtually all types of applications, large or small. Since the company is located in Western Washington, they frequently visit the Olympia area and are readily available for service requests. In March 2006, Hallmark installed a new silver recovery system at the Thurston County Moderate Risk Waste Facility (HazoHouse) located in Lacey, Washington. HazoHouse began accepting used x-ray fixer free of charge from all Small Quantity Generators (SQGs) per Ecology regulations. Within two months after installing the system, HazoHouse received approximately 100 gallons of used fixer from local dentists. Conservatively, it is estimated that HazoHouse will receive approximately 600 gallons of used fixer per year, which will result in the recycling of approximately 20 pounds of silver.

Due to the estimated demand for free silver recycling services, the LOTT Alliance installed a similar Hallmark recovery system at the Budd Inlet wastewater treatment plant in downtown Olympia. This new service offers a convenient drop-off location for businesses located in the Olympia-Tumwater areas, while the HazoHouse drop-off location benefits the Lacey-Yelm areas (See Appendix J).

Best Management Practices

In addition to regulatory requirements, other recommended BMPs are also presented during technical assistance visits. The goal is to encourage businesses to improve all aspects of hazardous material management, from chemical purchasing to final waste disposal.

Table 6: Best Management Practices

Best Management Practice (BMP)	Number of Times Suggested	Number of Times Implemented
Use capsulated amalgam alloy	0	0
Purchase appropriate amount of products	0	0
Store products so they don't become a waste	0	0
Recycle scrap amalgam	18	16
Salvage scrap amalgam from restorations	31	27
Recycle waste x-ray film	31	15

Recycle lead foil and aprons	13	12
Recycle fluorescent lamps	21	7
Install ISO 11143 approved amalgam separator	3	3
Collect vacuum pump waste and properly dispose	21	10
Use chair-side traps to collect scrap amalgam	4	4
Avoid mixing amalgam and biohazard waste	34	28
Test silver recovery system frequently (silver, pH)	10	9
Replace silver cartridges at appropriate intervals	9	9
Remove excess accumulation of waste(s)	14	12
Keep disposal receipts and/or log book	42	32
Use less toxic system cleaners	0	0
Label unmarked containers/drums	6	6
Keep/update Material Safety Data Sheets (MSDS)	1	1
Obtain appropriate spill supplies	28	20
Implement spill plan	32	20
Provide adequate secondary containment	17	15
Seal floor drains	2	2
Secure shelving	6	4
Implement hazardous materials training for staff	1	1
Total BMPs	344	253

Customer Survey

Forty-eight (48) of the 72 (66%) businesses that received a customer survey during the initial site visit completed and returned the form. A summary of the customer survey form is listed below in **Table 7**.

Table 7: Customer Survey Responses

Survey Question	Yes	No	Unsure	No change needed
1a. Was your business in compliance following the initial visit?	19	26	3	

	Yes	No	Unsure	No change needed
1b. If not, were you in compliance by the end of the campaign?	28	0	1	

	Yes	No	Unsure	No change needed
2. Did the visit assist you in making changes in the way you manage your hazardous materials/wastes?	45	1	0	3

	Disposal costs	Equipment costs	Where to obtain disposal information?	Understanding regulations	Extra time required for proper management and disposal	Safety and liability issues
3. What concerns you most about proper hazardous waste management?	12	5	14	27	8	14

4. Where do you obtain information regarding hazardous materials management?
 Comments: *Govt. Agencies (28), Dental Assn. (12), Vendor (7), Online (2), Training Classes (2), Material Safety Data Sheets (1), Corporate Office (1), Word of Mouth (1)*

	Yes	No	Unsure	No change needed
5a. Did you have any specific questions during the visit?	20	26	0	
Please describe: <i>Waste Disposal (14), Disposal Vendors (2), Safety Supplies (2), Other (2).</i>				

	Yes	No	Unsure	No change needed
5b. If so, did the county specialist	28	0	1	

provide specific answers that addressed your question?				
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	Yes	No	Unsure	No change needed
6. Was the specialist knowledgeable?	49	0	0	

	Yes	No	Unsure	No change needed
7a. Do you plan to use the "Dental Waste Resource Guide" CD for current or future reference?	42	3	4	
7b. Which format do you prefer? <i>Computer CD: 26</i> <i>Paper copy: 23</i>	N/A	N/A	4	

	Yes	No	Unsure	No change needed
8. Overall, did your business benefit from the technical assistance program?	55	2	0	
Comments:				

	Yes	No	Unsure	No change needed
9. In addition to the technical assistance program, TCEH provides businesses with an information line, newsletter, disposal site, and a website. Do you currently use or will you use these services?	N/A	N/A	N/A	
Which services? <i>Hazardous Waste Hotline: 11</i> <i>Business Newsletter: 10</i> <i>HazoHouse: 36</i> <i>Website: 22</i>				

	Yes	No	Unsure	No change needed
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10. Are there additional services TCEH can provide?	3	24	21	

	Yes	No	Unsure	No change needed
11. Thurston Co. has considered purchasing a silver recovery system in order to provide free drop-off service for fixer disposal. If offered, would you use this service?	38	11		
If yes, which drop-off location would you prefer?	1. <i>LOTT Wastewater Alliance: 17</i> 2. <i>Thurston Co. HazoHouse: 21</i>			

12. Additional Comments?	<i>Thank You (5), Very Helpful (2), Very Informative (2), Very Pleasant Meeting (2), Good Information (1), Very Professional (1), Knowledgeable Specialist (1), Love the CD (1), Dons Camera does a good job (1), Transporting fixer is difficult (1).</i>
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Meeting the Goals of the Hazardous Waste Plan for Thurston County

Success of the technical assistance and compliance elements of the Business Pollution Prevention Program are measured by goals established in the 1998 Hazardous Waste Plan for Thurston County. The outcomes for each goal are listed below:

Protect ground water, surface water, soils, sediments, and private property from hazardous materials and hazardous waste contamination:

- √ Fifty (50) businesses achieved compliance with the Thurston County Nonpoint Source Pollution Ordinance, which mandates proper storage and disposal of hazardous materials.
- √ Thurston County verified that 22 businesses were already conducting proper management and disposal of hazardous materials.
- √ Thirty (30) businesses stopped improperly disposing of mercury amalgam waste.

- √ Fourteen (14) businesses improved their chemical storage practices by installing adequate secondary containment. This included the installation of spill containment pads and/or sealing floor drains to prevent hazardous material discharges into the environment.
- √ Eight (8) businesses stopped discharging spent x-ray chemicals into on-site septic systems or the LOTT sewer system.
- √ Thirty-two (32) businesses updated and improved their waste disposal recordkeeping practices, which ensures proper handling of all types of hazardous materials and waste.

Increase the rate of waste reduction, which conserves resources and reduces demand for disposal and recycling services:

- √ Thurston County HazoHouse and the LOTT Alliance created new local drop-off services for silver waste recycling, which eliminates the need for long-distance transportation to out-of-state disposal facilities.
- √ Eighteen (18) businesses upgraded to proper on-site chemical treatment systems, which recycle silver and eliminates the need for off-site transportation and disposal of spent photographic fixer.
- √ The campaign verified that 38 businesses utilize vendors that monitor and manage chemical inventories, which help prevent shelf life expiration resulting from overstock situations.
- √ The campaign verified that every business utilized at least one type of less toxic chemical alternative, which commonly included low-toxicity disinfection products.
- √ Sixteen (16) businesses no longer utilize mercury amalgam and 37 others plan to decrease amalgam use.
- √ Fifteen (15) businesses utilize digital x-ray, which produces no chemical waste.

Increase the percentage of hazardous waste collected (that cannot be prevented through waste reduction in the first place):

- √ As a result of the campaign, two new silver waste recycling services were created by Thurston County HazoHouse and the LOTT Alliance. It is estimated that these services will collect and treat approximately 600 gallons of spent x-ray fixer per year, resulting in over 20 pounds of recycled silver.
- √ Thirty (30) businesses stopped improperly disposing of scrap amalgam and now utilize recycling services.
- √ Fourteen (14) businesses permanently removed inadequate silver treatment systems and now use proper off-site recycling services.
- √ As a result of the campaign, twelve (12) businesses disposed of accumulated waste chemicals.
- √ Four (4) businesses stopped improperly disposing of scrap lead and now utilize recycling services.

- √ Four (4) businesses installed mercury amalgam separators that collect scrap amalgam for future recycling.
- √ Four (4) businesses agreed to recycle spent fluorescent lamps.

Reduce the amount of hazardous materials that is improperly stored, improperly disposed, and accidentally spilled into the environment:

- √ As a result of the campaign, 50 businesses stopped improperly storing and/or disposing of hazardous wastes.
- √ Fourteen (14) businesses added secondary containment to their chemical storage areas.
- √ Thirty-three (33) businesses contained inadequate silver treatment systems, which were all upgraded or removed as a result of the campaign.
- √ Thirty (30) businesses stopped improperly disposing of mercury amalgam waste.
- √ Eight (8) businesses were improperly disposing spent x-ray chemicals into septic or sewer systems. These issues were resolved by utilizing waste disposal vendors or proper treatment systems.
- √ Twenty (20) businesses agreed to implement written emergency spill plans for their facilities.
- √ Twenty (20) businesses updated their emergency spill kits or purchased additional spill supplies.

Reduce damage to collection and transfer vehicles, and disposal equipment, and reduce disruption of treatment facilities by ensuring hazardous waste is kept out of these facilities or systems:

- √ As a result of the campaign, six (6) businesses stopped improperly disposing of spent x-ray chemicals into onsite septic systems.
- √ Two (2) businesses stopped improperly disposing of spent x-ray chemicals into the LOTT municipal sewer system.
- √ Eighteen (18) businesses upgraded to proper on-site chemical treatment systems, which prevents untreated silver waste from entering the LOTT municipal sewer system.
- √ Fourteen (14) businesses permanently removed inadequate silver treatment systems, eliminating the potential for improper sewer discharges.
- √ Four (4) businesses installed mercury amalgam separators that collect scrap amalgam and reduce mercury discharges to wastewater.
- √ Twenty-one (21) businesses agreed to obtain updated Material Safety Data Sheets, which provide proper disposal, handling, and safety information for x-ray chemicals.
- √ Six (6) businesses agreed to properly label waste storage containers, which prevents improper waste handling and disposal.

Reduce potential for causing publicly owned facilities such as the landfill or sewage treatment plants to exceed pollutant discharge limits:

- √ Fifty-five (55) businesses utilize vendors to service amalgam separators, which helps to ensure that the systems are functioning properly, reducing potential mercury discharges to wastewater.
- √ The campaign verified that twenty-two (22) businesses utilize vendors to service their silver recovery systems, which helps ensure that no silver waste enters wastewater treatment systems.
- √ Thirty-three (33) businesses contained inadequate silver treatment systems, which were all upgraded or removed as a result of the campaign.
- √ Eight (8) businesses stopped improperly disposing of spent x-ray chemicals into the municipal sewer or onsite septic systems.
- √ Twenty-one (21) businesses received information regarding proper disposal options for spent fluorescent lamps.
- √ In order to prevent spills from entering the sanitary sewer or onsite septic system, fourteen (14) businesses provided additional secondary containment for chemical storage areas.

Conclusions

This single-industry campaign focused on the dental industry. Most single-industry campaigns focus on business types that represent a potential risk to public health and the environment. This risk is illustrated by improper storage, use, and disposal of hazardous materials. Dentists were identified as good candidates for technical assistance due to the various heavy metal wastes produced. Mercury, silver, and lead are toxic to humans and persistent in the environment. Since heavy metals are not adequately treated by onsite septic or sanitary sewer treatment systems, any waste entering these systems has the potential to impact the environment.

Twenty-two (22) of the 72 businesses (31%) inspected were in compliance with the Thurston County Sanitary Code, while 50 (69%) were not. The most common compliance issues involved improper silver recovery systems and improper scrap amalgam disposal. Thirty-three (33) businesses contained improperly maintained and/or inadequate silver recovery systems. Eight (8) others improperly discharged spent x-ray chemicals into the municipal sewer or septic system. A total of 30 businesses (42%) were improperly disposing of chair-side scrap amalgam.

Compliance rates for amalgam separator installation were very high. Sixty-eight (68) dental facilities (94%) installed the proper amalgam separator prior to the initial site visit. This high rate of compliance appeared to be inconsistent when compared with the much lower rates of compliance for silver and chair-side scrap amalgam disposal. Since 2003, Ecology and the WSDA made numerous contacts to dental facilities statewide, offering

detailed information regarding the new requirements for dental waste management. The information included proper handling procedures for all types of waste as well as local disposal resources and vendors. It is unclear why dental facilities in Thurston County implemented amalgam separator improvements more readily than other best management practices offered by Ecology and the WSDA.

After reviewing the customer surveys, several trends were identified that may offer clues regarding these inconsistent compliance rates. When asked what concerns businesses most about hazardous waste management, 27 of 48 respondents (56%) cited the understanding of regulations, while another 14 respondents (29%) cited knowing where to obtain disposal information. However, when asked where dental facilities obtain disposal information, 28 respondents (58%) cited government resources. Only seven respondents (15%) utilize vendors for waste disposal information, which was surprising since most vendors offer disposal services and provide disposal-related equipment. Since vendors have the most frequent contact with businesses, it is suggested that future technical assistance efforts include or start with waste disposal vendors.

After concluding the campaign, it was evident that the participating businesses improved their waste management practices and clearly benefited as a result of this effort. Forty-eight (48) businesses achieved compliance and a total of 135 separate compliance issues were resolved. In addition, eight (8) businesses stopped discharging untreated wastes into sewer or septic systems and fourteen (14) others added secondary containment to chemical storage areas. Together, the businesses implemented 255 BMPs and were provided with two new silver waste recycling options.

Appendix A:

Memorandum of Understanding



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

*P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006*

**Memorandum of Understanding
Washington State Department of Ecology
And
Washington State Dental Association**

Parties

The Washington State Department of Ecology (“Ecology”) is the state’s environmental agency that has enforcement responsibility under federal and state water and waste environmental laws for the purpose of this Memorandum of Understanding (MOU). Ecology has delegated permitting and compliance authority and responsibility for implementing the federal Clean Water Act pretreatment program to the following municipal jurisdictions: Everett, King County (Metro/King County service area), Lynnwood, Olympia (LOTT), Pierce County (Chambers Creek service area), Port Angeles, Richland, Spokane, City of Tacoma, Vancouver, and Yakima. These jurisdictions are the wastewater management authorities for the local sewerage systems pertinent to dental offices in these areas.

The Washington State Dental Association (“WSDA”) is a voluntary membership association of Washington dentists.

The parties recognize there are an estimated 2,600 dental offices in Washington State.

Purpose of MOU

Both Parties acknowledge the importance of implementing mercury reduction actions published in the **Washington State Mercury Chemical Action Plan**, “Dental Facilities-Recommended Actions.”

Ecology’s objective is to reduce the amount of dental amalgam waste that may now be discharged from dental offices to sewer treatment plants or into privately-owned onsite septic systems. The purpose of the MOU is to recognize WSDA’s and Ecology’s mutual desire to achieve compliance and protect Washington’s environment within the term of this MOU by timely incorporation of best management practices regarding regulated waste management in Washington State dental offices.

Through their mutual discussion of dental amalgam waste issues, Ecology’s representatives and the WSDA Task Force on Dental Amalgam Waste determined the common objectives of

Ecology and the WSDA are most likely to be achieved by implementing the steps outlined below in this MOU.

Nature of MOU

The MOU addresses the effective management and disposal of mercury generated from dental practice such that the water and waste regulations are complied with to protect Washington's environment. The advocacy of BMPs in this MOU does not address dental standards of practice related to therapeutic use and placement of amalgam fillings.

Ecology is exercising its prosecutorial discretion to pursue a voluntary compliance strategy with WSDA to achieve a significant reduction of mercury waste from dental offices. This achievement will be consistent with the goals of the **Washington State Mercury Chemical Action Plan**, (Department of Ecology Publication No. 03-03-001, January 2003).

WSDA supports the science that supports the safety of dental amalgam. The WSDA cannot bind its membership, but joins in this MOU to advocate with dentists to voluntarily adopt amalgam best management practices (BMPs) described herein. The WSDA has as one of its purposes the advancement of the science of dentistry. This includes progress in the effective management of dental amalgam waste.

Best Management Practices

Ecology and WSDA each will support and advocate that dental offices implement best management practices (BMP) concerning dental amalgam waste as follows:

1. Install, use and maintain International Standards Organization (ISO) certified amalgam separators. Installation applies to all offices regardless of sewer disposal type (public system or septic), but would not apply to practices that are restricted exclusively to these dental specialties: Orthodontics and Dentofacial Orthopedics; Oral and Maxillofacial Surgery; Oral Medicine and Pathology; Oral and Maxillofacial Radiology; Periodontics; and Endodontics and Prosthodontics, provided amalgam fillings are neither placed nor removed in these practices or are only placed or removed on less than 10 practice days during the year.
2. Collect all amalgam waste (both scrap and contact amalgam) in separate container. No dangerous waste or amalgam is to be placed in the infectious waste "red bag."
3. Properly manage and dispose of all other dangerous waste streams generated by the dental office (e.g., x-ray wastes, or lead foils/aprons).
4. Properly dispose of all scrap amalgam waste from traps, filters and separators with a licensed treatment, storage, disposal or recycling facility.
5. Keep amalgam out of sinks and never rinse amalgam waste down the drain.
6. Clean or replace chair-side traps on a regular schedule and properly dispose of amalgam waste.
7. Clean vacuum pump filters regularly, according to the manufacturer's recommendations.
8. Maintain all disposal records on site for three (3) years.

Statewide Dental Amalgam Waste Reduction Education and Outreach

Ecology and WSDA will jointly develop a statewide dental amalgam waste reduction strategy of specific actions to inform dental offices about relevant law and regulation regarding management of dental amalgam waste and to encourage voluntary implementation of BMPs for dental offices. The focus of the outreach will be to distribute the BMPs and spell out dentist's responsibilities to correctly manage waste dental amalgam and all other dangerous wastes. Ecology will identify to WSDA appropriate recycling facilities, hazardous waste management facilities, and moderate risk waste facilities that can be used to manage wastes from dental activities. Ecology will offer technical assistance, and if requested, will provide presentations at state or regional conferences or workshops. The strategy may use the resources available to Ecology and WSDA within the limits of each organization's budget intended for this purpose. Ecology and WSDA will jointly develop a timetable for implementing actions in this strategy following mutual discussion of both parties of the strategy.

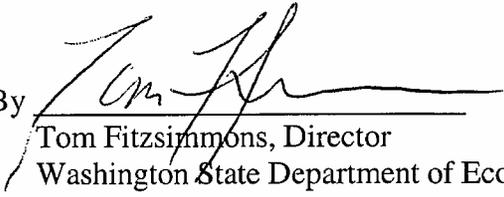
Outcomes

The parties agree that the goal of this MOU is that Washington dental offices will implement BMPs, to be measured as follows:

1. Ecology and WSDA will jointly develop a reporting system for notification by the dental office of the installation of an amalgam separator system in the dental office. Reports will specify the date of installation, dental office location and owner, model of separator, and the name, address and phone number of the installer.
2. Installation notification will be made to Ecology, the sewer treatment plan permit holder within which jurisdiction the dental office is located, and to the WSDA at the end of each quarter of the year.
3. Prior to August 2004, Ecology and WSDA will conduct a survey of dentists to establish a baseline level verification of dental offices following the prescribed BMPs. A second survey will be conducted prior to August 2005 to determine if the number of dental offices following the BMPs has increased. Results of the survey will be shared with local governments.

During the transition outlined in this MOU, it is understood to be a voluntary program by dental offices. Ecology will not seek to require dental offices to have new discharge permits or compliance reporting while this MOU is in effect but will have enforcement discretion to apply applicable laws and regulations to dental offices upon completion of the effective date of this MOU.

Each year within a few months after the report count is available, WSDA and Ecology representatives will meet to review and discuss progress made and whether any practical, additional steps could be effective to achieve a higher rate of voluntary participation.

By 
Tom Fitzsimmons, Director
Washington State Department of Ecology

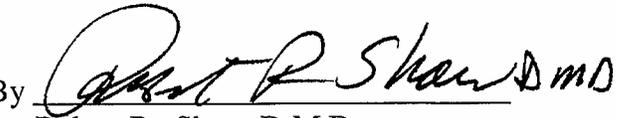
By 
Robert R.. Shaw, D.M.D.
President, Washington State Dental Association

Exhibit A

Certification of Recognition

The dental office of Dr. _____ follows waste-disposal best management practices in accordance with recommendation of the State Department of Ecology and the Washington State Dental Association.

The State of Washington and WSDA express appreciation.

By _____
Title, Washington State Department of Ecology

By _____
President, Washington State Dental Association

Appendix B:

Compliance with the Nonpoint Source Pollution Ordinance

Compliance with the Nonpoint Source Pollution Ordinance

“The Health Department's approach to compliance assumes that the majority of hazardous waste generators want to ‘do the right thing’ and simply need to recognize how to make it happen.”

This fact sheet describes the Thurston County Health Department's approach to implementing the hazardous waste sections of the Nonpoint Source Pollution Ordinance (Article VI of the Sanitary Code) and explains the procedures that govern its enforcement. The ordinance, which took effect in May 1993, is part of the Business Pollution Prevention Program's efforts called for in the county's Hazardous Waste Plan and supported by Thurston County and its incorporated cities.

PROACTIVE AND REACTIVE FIELD INSPECTIONS

The Health Department implements the ordinance with either a proactive or reactive approach.

Proactive inspections – those in which the Health Department takes the initiative to approach businesses rather than waiting for inquiries or complaints – will be directed, within a limited time frame, at all businesses of a given type, and will be preceded by an opportunity for education about the ordinance. The process is designed to resolve all violations while avoiding inequitable or arbitrary enforcement of the ordinance among different competitors in the same field.

When the Health Department receives a complaint from the public about a violation of the ordinance, the Department reacts to the report and investigates. In these cases, enforcement action may be taken. Nonetheless, the goal is still to correct the violation rather than issue tickets, so field staff will work as constructively as possible with the violator to make necessary changes.

WHAT THE ORDINANCE SAYS

The following is an excerpt from Article VI, Section 4 of the Sanitary Code:

- 4.1 (a) Moderate risk waste and petroleum products including, but not limited to, oil and grease, shall be disposed of by recycling or use of a hazardous waste management facility operating under interim status or with a permit issued by EPA or an authorized state . . . No person shall, intentionally or negligently, dump or deposit, or permit the dumping or depositing of any such waste in any other manner, including onto or under the surface of the ground or into surface or ground water.
- 4.1 (b) Moderate risk waste, petroleum products, and hazardous materials shall be kept in containers and shall be stored in such a manner and location that if the container is ruptured, the contents will not discharge, flow, be washed or fall into surface water or ground water.
- 4.1 (c) Any person violating this section or owning or in possession of the premises, facility, vehicle or vessel from or on which waste is discharged or placed in violation of this section, shall notify the Department of the location and nature of the violation and shall immediately take or cause to be taken all necessary steps to prevent injury and protect waters from pollution.

IF HEALTH DEPARTMENT STAFF OBSERVE A VIOLATION OF ARTICLE VI . . .

Field staff have three options for response to violations. The ordinance specifies that compliance officers must respond to any violation they believe has occurred or is occurring. The three options are:

- an informal notification to the violator explaining the violation and recommended options for correcting the problem;
- a Notice of Violation, which begins formal administrative enforcement; and
- a Notice of Civil Infraction, which is similar to a traffic citation in that it carries a fine and is resolved in court.

Which option is used will depend on the type and severity of the violation and prior opportunities the violator has had to learn about and comply with the law. It is important to understand that, regardless of the initial response chosen and time frame allowed, the ordinance requires the Health Department to follow-up with increasingly stronger measures until the violation is eventually corrected.

IF YOU RECEIVE AN INFORMAL NOTICE CONCERNING COMPLIANCE WITH ARTICLE VI . . .

An informal notification offers an opportunity to comply voluntarily. The Health Department's approach to compliance assumes that the majority of hazardous waste generators want to "do the right thing" and simply need to recognize how to make it happen. The informal notification would typically consist of a letter or notice of noncompliance following a voluntary technical assistance visit during which a violation was observed. It is intended to help the business understand the reason for the violation and the options available for correcting the problem. This notification will not specify an exact time frame for compliance.

IF YOU RECEIVE A FORMAL COMPLIANCE INSPECTION . . .

A formal compliance inspection involves a visit to your business by a county hazardous waste specialist. The specialist will examine your facilities and practices with respect to two issues:

- management of hazardous wastes and petroleum products (all must be recycled or sent to a permitted disposal facility); and
- storage of hazardous wastes, petroleum products and hazardous products (all must be kept from reaching ground or surface water).

At the end of a compliance inspection, you will receive a Notice of Compliance, a Technical Assistance Notice of Noncompliance, or a Notice of Violation, described briefly here.

A Notice of Compliance documents your good-standing at the time of the inspection. If you are managing your hazardous wastes properly – either recycling them at your facility or sending them to another facility for disposal or recycling – you will receive a Notice of Compliance for you to file as a record of your status. If you are recycling the waste on site, the inspector will need to see the recycling methods and/or equipment used and may want to verify the proper operation of the equipment. If you are sending the waste off site, the inspector will need to see documentation of at least one recent pick-up that includes the name and phone number of the collection service.

Note that a Notice of Compliance documents your status only with respect to the Nonpoint Source Pollution Ordinance and only on the day of the inspection. It does not preclude a later change in status if your practices change, or if new information indicates the inspection results were inaccurate. It also does not comment on compliance with any other laws you may be subject to, such as fire, building, zoning, licensing, and worker safety regulations.

A Technical Assistance Notice of Noncompliance identifies why the site is out of compliance. A Technical Assistance Notice of Noncompliance typically is used for lack of secondary containment or lack of waste disposal documentation. It is signed by both the violator and the inspector and includes a mutually agreeable grace period for the site to come into compliance.

A Notice of Violation is the first step in the “formal” administrative enforcement process. Field staff would typically issue a Notice of Violation (NOV) in cases where the alleged violator has already had at least one opportunity to learn about, and comply with, the ordinance. It may also be issued immediately in cases of flagrant or particularly negligent violations. The NOV can be presented to the violator in person or sent by registered or certified mail. It will state the section of the ordinance that was or is being violated, a brief description of facts supporting this finding, a list of actions that must be taken to resolve the matter, and a date by which these actions must be taken. The process for responding to an NOV and your rights under this process are described on the back of the NOV. Some important elements of this process are listed below.

- **You have the right to appeal.** You may do so by submitting a written request for an administrative hearing to the Health Officer at the Thurston County Health Department, 2000 Lakeridge Dr. SW, Olympia WA 98502-6045, within ten days of the date of issuance of the Notice of Violation.

- **Corrective actions are postponed until after the hearing.** If you file a request for a hearing, you may temporarily postpone taking corrective actions pending the hearing outcome.
- **Administrative hearings allow an opportunity to present evidence that you did not violate the ordinance.** Evidence may include testimony of witnesses, affidavits and documents, and other exhibits such as photographs.
- **You may appeal the results of an administrative hearing.** If you are unsatisfied with the results of an administrative hearing, you may appeal these findings and actions to the Thurston County Board of Health.

IF YOU RECEIVE A NOTICE OF CIVIL INFRACTION . . .

Violations of Article VI of the Sanitary Code are civil infractions enforceable by the court and subject to fines of up to \$498 (including court costs). Once a Notice of Violation has been issued, the process of issuing and enforcing a civil infraction will not begin until and unless the administrative process described above runs its course without resolution. If you do not, in the specified time frame, take the actions required by a Notice of Violation, or those required by a subsequent administrative or Board of Health hearing, you will be issued a Notice of Civil Infraction (a “ticket”), which is handled similarly to a traffic citation. You may:

- pay the penalty;
- request a hearing to contest or explain the circumstances of the alleged violation; or
- ignore the ticket, which would automatically result in your being found guilty and responsible for the full amount of the fine.

The Notice of Civil Infraction, when issued, explains in more detail your options and rights under the civil process.

If you would like a copy of the Thurston Count Nonpoint Source Pollution Ordinance or any part of the Sanitary Code, or if you have questions on this enforcement process, please call the Business Pollution Prevention Program at (360) 786-5457 or TDD (360) 754-2933, Monday through Friday from 8:00 a.m. to 5:00 p.m. or see our website <http://www.co.thurston.wa.us/health/ehrp/hwaste.html>

Other Hazardous Waste Management and Disposal Fact Sheets

- *Antifreeze, Used Oil, & Oil Filters*
- *Disposal of Petroleum-Contaminated Absorbent Materials*
- *Floor Drains*
- *Hazardous Waste Disposal*
- *Oil/Water Separators*
- *Residential Heating Oil Tanks*
- *Secondary Containment*
- *Solvents and Parts Cleaners*
- *Storing and Labeling Hazardous Waste*
- *Used Shop Towels*

January 2004

Appendix C:

Letter of Invitation



THURSTON COUNTY

WASHINGTON

SINCE 1852

COUNTY COMMISSIONERS

Cathy Wolfe
District One
Diane Oberquell
District Two
Robert N. Macleod
District Three

**PUBLIC HEALTH AND
SOCIAL SERVICES DEPARTMENT**

Letter of Invitation

September 1, 2005

Sherri McDonald, RN, MPA,
Director
Diana T. Yu, MD, MSPH
Health Officer

XXXX
XXXX
XXXX

RE: 2005 Technical Assistance Campaign – Dental Waste Management

Dear Dental Professional:

This summer and fall, the Thurston County Business Pollution Prevention Program will be conducting a Technical Assistance Campaign for local dentists. The purpose of our campaign is to assess the proper storage, treatment and disposal of mercury-containing waste, x-ray chemicals, and lead waste. Two years ago, a Memorandum of Understanding (MOU) between the Washington State Department of Ecology and the Washington State Dental Association recommended various Best Management Practices (BMPs) designed to greatly reduce the amount of heavy metal wastes being discharged to the environment. Since the MOU expired on July 31, 2005, dentists are now held fully responsible by Ecology for proper management and disposal of hazardous wastes. Dental offices that follow the prescribed BMP's, including installation of amalgam separators, should be in compliance with existing dangerous waste regulations. In addition to verifying the implementation of these recommended BMPs, county staff will also provide information to help your business gain or maintain compliance with the Thurston County Nonpoint Source Pollution Ordinance as well as local wastewater regulations.

During our technical assistance visit (approximately 30 minutes), county staff will review your waste management procedures and verify that your practice is in compliance with state and local waste disposal regulations. If issues resulting in noncompliance are found that cannot be corrected during the initial visit, we will conduct a follow-up visit to help your site attain compliance. Businesses that are not interested in participating in a technical assistance visit may receive drop-in compliance audits.

The Thurston County Environmental Health Division has been conducting Technical Assistance Campaigns since 1994. These past campaigns have included wrecking yards, automobile repair shops, marinas, commercial painters, furniture manufacturers, and school chemistry laboratories. The Dental Waste Management campaign is a continuation of our efforts to protect public health and the environment by providing free assistance to businesses that store and dispose of hazardous wastes.

Please contact me by September XX to schedule your site visit. I can be reached at (360) 754-4111, ext. 6451 Monday through Thursday during normal business hours. We are pleased to serve the dental industry and look forward to working with you.

Sincerely,

Bradley A. Zulewski, R.S.

Bradley A. Zulewski, R.S.
Environmental Health Specialist

Environmental Health Division: 2000 Lakeridge Drive SW, Olympia, Washington 98502-6045

Fax (360) 754-4111 • TDD (360) 754-2933

www.co.thurston.wa.us/health

Appendix D:

Commercial Parcel Inventory Form

Commercial Parcel Inventory Form – Dental Campaign

Visit Date:	County Staff:	Time On Site: Time Off Site:
Business Name:		Business Owner:
Site Contact and Title:		
Site Address: City: Zip: Phone:		Mailing Address: City: State: Zip: Phone:()
Parcel #	EPA ID #:	
Land Owner: Address: City: State: Zip: Phone:()		
1. Nature of Property: <input type="checkbox"/> Home Business <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Government Site (Circle one: County, City, State, Federal)		
2. Is the facility: <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased		
3. What year did you begin conducting business at this site?		
4. Generator Status: <input type="checkbox"/> SQG <input type="checkbox"/> MQG <input type="checkbox"/> LQG		
5. Have there been past environmental inspections at the facility (Get a copy)? <input type="checkbox"/> Yes, Year _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown		
6. Does the facility have Material Safety Data Sheets for chemicals on-site? <input type="checkbox"/> No <input type="checkbox"/> Yes		
7. What is your facility's drinking water source? <input type="checkbox"/> City water <input type="checkbox"/> Community well <input type="checkbox"/> Private well <input type="checkbox"/> Unknown Name of water system (well #)		
8. Is there an on-site well? <input type="checkbox"/> Active <input type="checkbox"/> Inactive <input type="checkbox"/> Decommissioned		
9. What is facility's means of wastewater disposal? <input type="checkbox"/> City sewer <input type="checkbox"/> Community septic <input type="checkbox"/> Unknown <input type="checkbox"/> On-site septic (Type: Gravity, Mound, Sand filter, Pressure dist., other _____)		
10. Which type of spill kit does the facility have? <input type="checkbox"/> None <input type="checkbox"/> Floor dry <input type="checkbox"/> Absorbent pads Is the spill kit adequate? <input type="checkbox"/> Mercury <input type="checkbox"/> Other _____		
11. Does facility have floor drains? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Not Applicable If yes, how many, where?		
12. Where do work area floor drains discharge? <input type="checkbox"/> City sewer <input type="checkbox"/> On-site septic <input type="checkbox"/> Community septic <input type="checkbox"/> City storm drain, ditch, stream, wetland or lake <input type="checkbox"/> Open bottom sump or vault <input type="checkbox"/> Unknown <input type="checkbox"/> Sealed (When) _____ <input type="checkbox"/> Other		

13. What is the monthly amount of waste generated (lbs)? (If liquid, assume 8.5 lbs. per gallon.)

14. What type of disposal service is used (list vendor)?

- Pick-up services none
 Mail-away services other (explain)
 Drop-off services

15. Silver recovery systems: None

If yes, what type: Single CRC Dual CRC Electrolytic

What is the monthly volume of treated waste?

How often is it used? Daily Weekly Monthly Quarterly or less

How is it serviced? Vendor Owner

Service frequency? 0-3 months 3-6 months 6 months-1 year or longer

Service records or log book? Yes No Last entry date?

Does the unit have a sampling port? Yes No

Are silver or pH tests conducted? Yes No Date of last test?

County silver test results:

County pH test results:

16. X-ray Materials:

Spent Fixer Disposal (if no silver recovery system)? Pickup Drop-off
 Sewer Septic

Spent Developer Disposal? Pickup Drop-off Sewer Septic
 Mixed with fixer

Unused Fixer/Developer? Pickup Drop-off Sewer Septic

X-ray films? Accumulated Trash Pickup Drop-off/Mail

Last shipment date:

17. Lead Waste:

Disposal method? HW Pickup HW Drop-off/Mail-away Trash

Biohaz Accumulated Other _____

Vendor name:

Last shipment date:

18. Scrap Amalgam:

Qty. (% vs. comp): None 25% 50% 75% 100%

Future amalgam use: None Same Less More

Type: Precapsulated Bulk Mercury

Disposal method? HW Pickup HW Drop-off/Mail-away Trash/sink
 Biohaz Accumulated

Disinfection method? None Heat Chemical

Separate containers (contact/non-con)? Yes No NA

Vendor name:

Last shipment date:

19. Amalgam Separator: None

Model Name:

ISO 11143 Certified? Yes No Date Installed:

Waste Disposal? Equip. Vendor Trash/sink HW Pickup
 Biohaz HW Drop-off/Mail-away

Disinfection method? None Heat Chemical

Vendor name:

Last shipment date:

20. Chair-side Traps:

Type: None Disposable Reusable

Service method: Vendor Owner

Disposal method? HW Pickup HW Drop-off/Mail-away Trash/sink Biohaz
Equip. Vendor

Disinfection method? None Heat Chemical

Vendor name: _____ Last shipment date: _____

21. Vacuum Pump Filter Waste:

Service method: Vendor Owner

Disposal method? HW Pickup HW Drop-off/Mail-away Trash/sink Biohaz
Equip. Vendor

Disinfection method? None Heat Chemical

Vendor name: _____ Last shipment date: _____

HAZARDOUS MATERIAL [L = LIQUID] [S = SOLID]	QUANTITY	P = PRODUCT W = WASTE	CONTAINER LABELED?	SECONDARY CONTAINMENT	WASTE DISPOSITION (VENDORS – LAST PICKUP)
Developer		P			
Fixer		P			
Developer		W			
Fixer		W			

Comments:

Appendix E:

Dental Waste Resource Guide CD-ROM

Appendix F:

Notice of Compliance



Thurston County Public Health and Social Services Department
Environmental Health Division

Nonpoint Source Pollution Ordinance Inspection Checklist

Business Name _____ Phone _____

Business Owner _____ Birthdate _____

Address _____ City _____ Zip _____

Compliance Officer _____ Issue Date _____ Time _____

MODERATE RISK WASTE: _____ **Avg. Qty/Mo** _____

NOTICE OF COMPLIANCE

- NO MODERATE RISK WASTE GENERATED.
Explain: _____
- RECYCLED Type of system: _____
ON-SITE Qty/Mo: _____ Date of installation: _____
- SENT Vendor: _____ Phone: _____
OFF-SITE Qty/Mo: _____ Date of last shipment: _____
 Documentation verified.
- SECONDARY CONTAINMENT ADEQUATE. _____

NOTICE OF VIOLATION

- I find you in violation of Thurston County Sanitary Code, Article VI, Section 4.1(a), 4.1.(b) OR 4.1(c) as specified below:

Description of violation: _____

Corrective action to be taken by _____(date) will be as follows: _____

See reverse for important information on your right to appeal this notice of violation.

Compliance officer: _____ Date: _____

Received by: _____ Date: _____

Thurston County Public Health and Social Services Department
Environmental Health Division

Appendix G:

Notice of Noncompliance



Thurston County Environmental Health
 Business Pollution Prevention Program
 Phone: (360) 754 4111 Fax: 754 2954

Technical Assistance Notice of Noncompliance

Business Name _____ Phone _____

Business Owner _____

Address _____

HAZARDOUS MATERIAL / WASTE	QUANTITY	PROVIDE CONTAINMENT	OBTAIN RECEIPTS

The hazardous materials or wastes listed above are currently being stored without secondary containment or receipts verifying proper disposal were not provided. The Thurston County Nonpoint Source Pollution Ordinance, Article VI of the Thurston County Sanitary Code, Section 4.1(a) states:

“Moderate risk waste and petroleum products including, but not limited to, oil and grease, shall be disposed of by recycling or use of a hazardous waste management facility operating under interim status or with a permit issued by EPA or authorized state....”

Section 4.1(b) states:

“Moderate risk waste, petroleum products, and hazardous materials shall be kept in containers and shall be stored in such a manner and location that if the container is ruptured, contents will not discharge, flow, be washed or fall into surface water or groundwater. This does not supersede any regulations as stated in the Uniform Fire Code.”

Since your business is participating in a technical assistance campaign, a mutually agreeable grace period is being provided to help you obtain compliance. See the back of this sheet for procedures to come into compliance with the Sanitary Code.

Noncompliance to be corrected by (date): _____

Received by : _____ **Date:** _____

Compliance Officer: _____ **Date:** _____

Appendix H:

Customer Survey

Thurston County Business Pollution Prevention Program

Customer Survey: Dental Campaign

1. Was your practice in compliance at the conclusion of the initial visit?

Yes No Unsure

If not, were you in compliance by the end of the technical assistance campaign?

Yes No Unsure

2. Did the visit assist you in making changes in the way you manage your hazardous materials/waste?

Yes No No changes needed

Comments:

3. What concerns you most about proper hazardous materials management and disposal?

- Waste disposal costs
- Equipment costs (i.e. spill kits, etc.)
- Knowing where to obtain disposal information
- Understanding disposal regulations
- Extra time it takes to ensure proper handling, storage, and disposal
- Potential safety and liability issues

4. Where do you get your information regarding hazardous materials management?

5. Did you have any specific questions during the site visit?

Yes No

Please describe:

If so, did the county specialist provide specific answers that addressed your questions?

Yes No Unsure

Comments:

6. Was the county specialist knowledgeable?

Yes No

Please return completed survey to:

**Thurston County Environmental Health
2000 Lakeridge Drive SW
Olympia, WA 98502**

7. Do you plan to use the "Dental Waste Resource Guide" CD for current or future reference?

Yes No Unsure

Which format do you prefer?

Computer CD Paper copy

8. Overall, did your practice benefit from the technical assistance program?

Yes No Unsure

Comments:

9. In addition to technical assistance programs, Thurston County Environmental Health provides businesses with the following resources. Do you currently or will you now utilize any of these resources:

- A hazardous material/waste hotline
- Business newsletter
- A hazardous waste disposal site (Thurston County HazoHouse)
- Website

10. Are there any additional services Thurston County Environmental Health can provide?

Yes No Unsure

Please list examples of services and topics your business would like to see:

11. Thurston County has considered purchasing a silver recovery system in order to provide a free drop-off service for x-ray fixer disposal. If offered, would you use this service?

Yes No

If yes, which drop-off location would you prefer?

- LOTT Wastewater Alliance – Downtown Olympia
- Thurston County HazoHouse – Hawks Prairie

13: Please share any additional comments:

Appendix I:

Best Management Practices

BEST MANAGEMENT PRACTICES FOR DENTAL FACILITIES

BUSINESS NAME: _____ DATE: _____

Recommendations	Already Doing	Suggested	Implemented (Date)
Waste Reduction:			
Use precapsulated amalgam alloy			
Purchase appropriate amount of products			
Store products so they don't become a waste			
Recycle:			
Recycle scrap amalgam			
Salvage scrap amalgam from restorations			
Recycle waste x-ray film			
Recycle lead foil and aprons			
Recycle fluorescent lamps			
Waste Disposal/Recycling:			
Install ISO 11143 approved amalgam separator			
Collect vacuum pump waste and properly dispose			
Use chair-side traps to collect scrap amalgam			
Avoid mixing amalgam and biohazard waste			
Never rinse amalgam into open drains			
Test silver recovery system frequently (silver, pH)			
Replace silver cartridges at appropriate intervals			
Remove excess accumulation of waste(s)			
Keep disposal receipts and/or log book			
Miscellaneous Improvements:			
Use less toxic system cleaners			
Label unmarked containers/drums			
Keep/update Material Safety Data Sheets (MSDS)			
Obtain appropriate spill supplies			
Implement spill plan			
Provide adequate secondary containment			
Seal floor drains			
Secure shelving			
Implement hazardous materials training for staff			

Business Representative: _____ Position: _____

Appendix J:

Disposal Options for Used X-ray and Photographic Fixer

Disposal Options for Used X-ray and Photographic Fixer

The Problem

“It is illegal to dispose of any image-processing chemicals into an on-site septic system.”

Medical facilities and other businesses generate waste silver fixer as part of imaging processes. Since silver is a toxic, persistent heavy metal, it must be managed properly in order to protect human health and the environment. How you decide to manage your waste largely depends on the quantity produced. Businesses that generate larger quantities may choose to purchase on-site silver recovery systems, while businesses producing minimal processing wastes may prefer drop-off or pick-up waste management services.

On-site Silver Treatment: For businesses generating larger quantities of silver waste, installing a silver recovery system may be a good option. These systems remove silver from solutions utilizing chemical recovery cartridges (CRCs) and produce a non-hazardous liquid that can be discharged to a municipal sewer system. Since silver is a valuable commodity, a refining company may then process the spent CRCs and recycle the raw silver. However, due to startup costs, refining fees, and regular maintenance, these systems may not be economical for businesses producing small quantities of silver-bearing waste. Before considering such systems, please visit http://www.ecy.wa.gov/dentalbmps/x-ray_recovery.html for additional details. It is illegal to dispose of any image-processing chemicals into an on-site septic system.

Pick-up Services: The following companies offer pick-up services in Thurston County. *Disposal fees apply.*

- CMX Corporation (800) 869-7191
- Safety-Kleen (800) 669-5948
- Hallmark Refining (800) 255-1895
- X-ray Used Fixer Service (253) 318-9921

Free Drop-off Services: There are *free* waste management services in Thurston County offering convenient drop-off locations. These services are ideal for businesses that do not generate enough waste (less than 5 gallons per month) to justify the cost of on-site treatment systems or other waste pick-up services.

- 1) Thurston County HazoHouse: *Free Drive-Thru Service, No appointment necessary.* Hours of operation are Friday, Saturday, Sunday, and Monday 8:00 a.m.-5:00 p.m. For questions please call (360) 786-5457.
- 2) LOTT Alliance – Budd Inlet Treatment Plant: *Free Drop-off Service, No appointment necessary.* Hours of operation are Monday-Friday 12:00 p.m.-3:00 p.m. Contact Ken Butti at (360) 528-5708

Any business that transports waste to drop-off locations must comply with Department of Transportation regulations. Please call Thurston County for additional details.

Additional Information about the Thurston County HazoHouse and LOTT Services:

- 1) Spent fixer and silver recovery cartridges (bucket-type filters) are accepted free of charge at both HazoHouse and LOTT. HazoHouse will accept other types of hazardous waste (i.e. fluorescent lamps, developer, lead, etc) for a small fee.
- 2) Customers are limited to disposing of five gallons per shipment; larger quantities may be accepted on a case-by-case basis. Please call for an appointment for shipments larger than five gallons.
- 3) Never mix developer with fixer. Mixed waste will damage the silver treatment system.
- 4) HazoHouse and LOTT may provide a limited number of reusable storage containers free of charge. Please call for availability.
- 5) In order to use this service, your business must be a Small Quantity Generator (SQG) as per Washington State Department of Ecology regulations.

Directions to Thurston County's HazoHouse:



Directions to LOTT Alliance's Budd Inlet Treatment Plant (Main Entrance-Adams St):



Thurston County's Business Pollution Prevention program offers free, non-regulatory on-site technical assistance to local businesses. Please contact the Business Pollution Prevention Program at (360) 786-5457, Monday through Friday, from 8 a.m. to 5 p.m., or at TDD (360) 754-2933 or see our website at <http://www.co.thurston.wa.us/health/ehhw/index.html> for more details about our program.