

School Lab Cleanout Program in Connecticut – 2002-2003



2002 School Lab Cleanout Initiative

Introduction

For the past five years, Connecticut has focused on mercury as a toxin of concern. Several scientific studies of mercury in the environment directed this emphasis. A 1998 EPA study indicated mercury deposition was higher in the northeast. Studies of fish tissue indicated high mercury levels in certain species in freshwater bodies in Connecticut leading to fish consumption advisories. The National Academy of Sciences found that “methylmercury exposure is a widespread and persistent problem in the environment” and may cause neurological problems in 60,000 children in America each year. In response to these and other studies, the northeast states developed a mercury action plan. One of the goals of this plan was to remove mercury from schools. A subsequent report to the legislature on mercury recommended dedicating funding for removing mercury from school labs.

Several school spill incidents were reported which helped to create greater awareness of the hazards of mercury. These spills involved broken mercury instruments as well as released elemental mercury. Schools were faced with large clean up bills and in one case, a lawsuit. One high school was faced with a \$250,000 cleanup bill after a broken barometer contaminated some schoolbooks stored in a trailer. The DEP began to see more interest from schools in conducting cleanouts. A number of schools conducted cleanouts that they paid for.

The DEP coordinated a school cleanout pilot in 2000, removing 75 pounds of mercury and mercury compounds from six schools. This cleanout was financed by a supplemental environmental project (SEP). In lieu of part of a monetary penalty, a company may choose to finance an SEP. After the pilot, the DEP continued to direct SEP funds toward mercury programs. In the spring of 2002, DEP began to plan for another round of school cleanouts.

Identifying Schools with Mercury

While conducting the first school cleanout pilot, the DEP established a list of schools that had indicated an interest in having a cleanout. When more SEP money became available in 2002, the Department contacted these schools. In addition, DEP sent a survey to every high school and middle school in the state in order to find other schools interested in a cleanout. In order to be eligible, the school had to have mercury. Schools responded to the survey, indicating they had mercury and were interested in conducting a school cleanout. From these two sources, 37 schools were selected to receive funding for a cleanout. DEP did not turn away any school that expressed an interest and met the criteria for participation.

The survey indicated a contact name and phone number. DEP contacted these schools as well as the schools on the waiting list and sent them a participation agreement. The participation agreement committed the school to surrendering all elemental mercury, mercury compounds and mercury containing instruments such as thermometers and barometers. Schools also agreed to attend a training session for managing hazardous chemicals, and not to purchase any of the same chemicals that were being removed. The schools turned in the agreements in July 2002 and the cleanouts began in August.

Participating Schools

Avon High School	Marvelwood School
Avon Middle School	New Britain High School
Bennie Dover Jackson Middle School Branford High School	New London High School
Brookfield High School	North Branford High School
Canton High School	North Branford Intermediate School
Cheney Technical School	Notre Dame High School (West Haven)
Conard High School	Oliver Wolcott Technical School
Coventry Schools	Parish Hill High School
EO Smith High School	Plainville High School
Gilbert School	Pulaski Junior High School
Hale Ray High School	Regional School District #7
Hall High School	Sedgewick Middle School
Hand High School	Seymour High School
Hillhouse High School	Southington High School
King Phillip Middle School	Valley Regional High School
Lily B. Haynes School	Wethersfield High School
Mansfield Middle School	Wheeler High School
Marianapolis Prep	Woodstock Academy

Participation Agreement with the Schools

After identifying the schools that would be participating in the cleanout, an agreement was sent to each school contact. This agreement indicated the conditions for participating in the program. By choosing to participating in the cleanout, the school agreed to turn over all their elemental mercury, mercury compounds, mercury instruments, and any other hazardous lab chemicals. It was made clear that this cleanout was for classroom chemicals and not maintenance supplies such as paint and cleaners, or used oil and pool chemicals. The school agreed not to purchase any mercury or other hazardous chemicals that were being removed. Finally, the school agreed to attend a teacher training seminar on hazardous chemical management. A principal or other high level administrator signed the agreement.

Selecting a Cleanout Contractor

DEP issued a request for bids for the school cleanouts. The list of prospective bidders came from the approved list of state spill response contractors. The contract was awarded to Environmental Services Incorporated (ESI) July 26, 2002. DEP met with ESI shortly after the bid was awarded to coordinate the collections, and specify what information DEP needed. DEP would schedule the cleanout dates with the schools. ESI would provide an accounting of the total amount of mercury collected from each school. The first cleanout was scheduled for August 15, 2002.

Scheduling Cleanouts

DEP initially intended to schedule as many collections as possible for August so as not to conflict with classes. While several cleanouts were conducted in August, many schools needed to wait until September or later because teachers were not at school during the

summer. DEP would schedule the cleanout with the school and then pass the information to ESI. It was soon determined that it was more efficient to have ESI schedule the collections by contacting the schools directly.

The first cleanouts were conducted in August to avoid handling the harmful chemicals while school was in session. Cleanouts conducted after schools started were to be conducted on Saturdays or after classes ended. ESI requested an amendment to the contract that would allow them to conduct the cleanouts while school was in session. ESI stated that they had safely conducted many school cleanouts while school was in session. They collect the unwanted chemicals and transport them with carts to a secure part of the building where they are segregated and packed. They also said it was significantly cheaper to conduct the cleanouts during regular business hours. The DEP granted the contract amendment and cleanouts were conducted during school hours.

How the Cleanouts were Conducted

The cleanouts were conducted in a manner to protect students, school staff and workers and prevent the release of chemicals to the environment. Planning the cleanouts began before the contractor arrived on site. The contacts at each school, usually the chemistry teacher, took an inventory of the chemicals to determine which would be kept and which would be discarded. ESI would contact the school to get an idea of the volume of chemicals and for anything highly reactive or otherwise requiring special handling.

ESI crews would arrive at the school and begin to segregate the chemicals by hazard class. The chemicals were written down on packing sheets or logged into a lap top computer. After all the chemicals were categorized, they were packed into approved shipping containers. ESI would make a second trip at a later date to pick up the containers.

Cleanout Results

The final cleanout was conducted at Brookfield High School in November 2002. ESI submitted packing lists and invoices to the DEP to determine types and quantities of chemicals removed. The cleanout was successful in that 156 pounds of elemental mercury, 75 pounds of mercury compounds, 1 gallon of liquid mercury compounds, 1447 lab thermometers and various other mercury instruments and other toxic chemicals were removed from the schools.

In addition to mercury, many other hazardous chemicals were removed from schools. At least four schools had radioactive materials including strontium 90. Other hazardous chemicals included toluene, xylene, carbon tetra chloride, sodium metal, magnesium metal, and benzene.

Teachers were grateful for the opportunity to remove these chemicals without having to pay. Many stated that they inherited chemicals from past teachers, and that some of the chemicals were decades old and hadn't been used in years. Schools frequently had far more of a particular chemical and they would ever use, citing the low cost of buying in bulk.

Program Costs

Program costs included labor, equipment, and disposal charges. The total cost of the cleanouts was \$160,000 with the average cost \$4,330. The highest cost was \$16,147 and the lowest \$661. The average was raised significantly by schools that had radioactive wastes. The radioactive wastes cost on average \$2,000-\$3,000 per school. Appendix A gives a complete list of costs for each school.

Teacher Training

The teacher training has not yet taken place. During the 2000 pilot, each school sent two persons to a DEP sponsored training workshop. The two-day training focused on hazardous waste management, regulatory requirements, and proper storage of chemical inventories. The training was provided free of charge. The training for this project will provide the same focus.

Future

There has been more SEP money dedicated to cleaning out schools in Connecticut. This particular SEP does not require the school to have mercury in order to participate. DEP is maintaining a list of school interested in this program.

DEP will continue to work with schools on proper management of lab chemicals including purchase and storage. The high number of schools that have already conducted cleanouts would seem to indicate that many schools have already heeded the message – to remove dangerous lab chemicals before an expensive lesson is learned.

Appendix A

School	Elemental Mercury (pounds)	Mercury Compounds	Mercury Instruments	Cost
Avon High and Middle Schools	5.25		63 thermometers	\$4,058.50
Bennie Dover Jackson Middle School			6 thermometers, 2 switches	\$4,736.00
Branford High School	1	1.5lb.	15 thermometers	\$7,641.50
Brookfield High	1.9	.5 lb.	19 thermometers, 1 manometer	\$7,458.90
Canton High School	2.75		12 thermometers, 1 manometer	\$1,912.50
Cheney Tech			64 thermometers, 1 guage	\$661.50
Conard High School	25			\$5,100.50
Coventry High School	3.5		143 thermometers	\$1,947.50
EO Smith High School	25	6.5 lb. 8 fl.oz.	118 thermometers	\$16,147.82
Gilbert School		2.9lb.	2 thermometers	\$5,255.20
Hale Ray High School	1	5lb.	22 thermometers	\$6,613.50
Hall High School			1 thermometer, 1 hydrometer	\$2,929.00
Hand High School	4	26lb. 36fl.oz.	134 thermometers	\$2,147.00
Hillhouse High School			63 thermometers	\$2,251.55
King Phillip Junior High			1 manometer	\$2,652.50
Lily B. Haynes School	1	.75lb.	29 thermometers, 3 manometers	\$9,500.40
Mansfield Middle School			225 thermometers	\$2,763.50
Marianapolis Prep	5.5	3.5lb 1fl.oz.	4 thermometers	\$18,377.55
Marvelwood School			3 thermometers	\$3,984.00
New Britain High School		5.25lb. 8 fl.oz.	31 thermometers, 6 switches	\$5,997.90
New London High School	28	5.5lb.	42 thermometers	\$6,169.60
North Branford High School	7.5	.1lb.	38 thermometers	\$5,563.50
North Branford Intermediate School	4		200 thermometers	\$3,726.50
Notre Dame High School (West Haven)	3.5	12lb. 58fl.oz.	92 thermometers	\$7,559.50
Oliver Wolcott Technical High School		1.75lb. 1 fl.oz.		\$5,017.50
Parish Hill High School	1		87 thermometers,	\$1,786.00
Plainville High School	5	2.5lb. 17 fl. oz.	50 thermometers, 12 switches	\$1,504.50
Pulaski Junior High			35 thermometers	\$2,550.41
Regional School District #7	1.25		14 thermometers	\$3,094.55
Sedgewick Middle School	6		6 thermometers	\$4,423.00
Seymour High School	1.8		30 thermometers	\$2,673.90
Southington High School	8.8	3lb.	93 thermometers, 12 manometers, 12 switches	\$1,304.00
Valley Regional High School	1		82 thermometers	\$11,241.50
Wethersfield High School	8	.75lb	108 thermometers	\$1,168.50
Wheeler High School	1.7	1.75lb. 8 fl.oz.	18 thermometers	\$6,515.90
Woodstock Academy	3		22 thermometers	\$6,262.50
TOTALS	156.45	78.75 lb. 1 gallon		\$160,234.73

Appendix B – Collection Process



Figure 1 – Lab Chemicals on the shelf waiting to be sorted



Figure 2 – Lab Chemicals seperated by teacher to be removed



Figure 3 – Lab chemicals are separated by chemical type

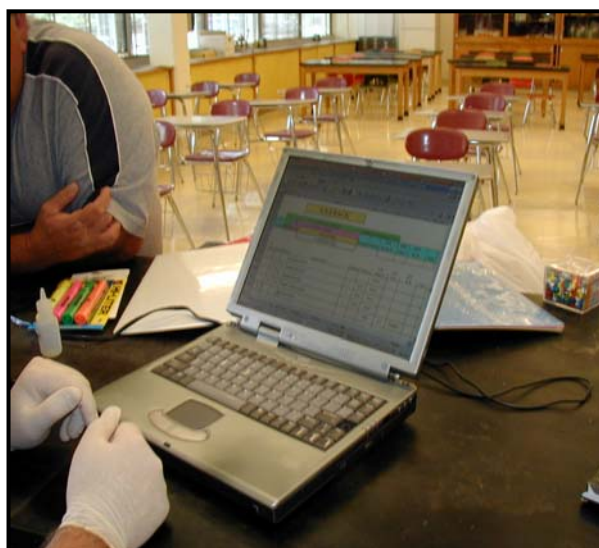


Figure 4 - Lab chemicals are entered into a database.



Figure 5 - Mercury containing lab instruments are placed into a lined container meeting all Department of Transportation requirements



Figure 6 - A packing list is generated that lists all the contents of a shipping container.



Figure 7 - Chemicals are packed into 5 gallon pails or 55 gallon drums. The drums are then sent off for recycling, fuels blending, or secure landfilling.