

# **FINAL REPORT**

## **Pollution Prevention (P2) Grant** **“Reducing Mercury in New York State Schools” NP - 98273802-0**

The New York State Department of Environmental Conservation (DEC), in partnership with the New York State Department of Health (DOH) and 20 school-related agencies, organizations and advocacy groups produced a series of materials focusing on mercury in schools, aptly named, “Mercury and Schools: A Risky Combination”. The series consisted of nine brochures, five of them audience-specific. These brochures and a description of their contents are as follows:

### **“Mercury and Schools - A Risky Combination”**

*Identifies what is mercury, its health risks and gives instructions to school personnel on how to locate mercury sources in their schools and possible action steps, contact names and numbers*

### **“Reducing Mercury in Schools - Science Teachers”**

*Reducing mercury in schools is an important goal for science teachers. Identifies where mercury sources are in the school, why it is a health concern. It offers actions steps for mercury management and what science teachers can do in the event of a mercury spill.*

### **“Reducing Mercury in Schools - Buildings and Grounds Superintendents”**

*When something is spilled or involves school equipment, buildings and grounds personnel are usually called in to deal with the incident. This brochure outlines action steps for buildings and grounds personnel to deal with mercury in school. It identifies what is mercury, where it can be located and why it is a health concern.*

### **“Reducing Mercury in Schools - School Nurses”**

*Identifies action steps for school nurses to take in managing and reducing mercury in their offices. Defines what is mercury and identifies mercury sources in their offices and why it is a health concern.*

### **“Reducing Mercury in Schools - Superintendents, Principals and School Boards”**

*School superintendents, principals, and school board members share the responsibility for not only educating students but also for maintaining occupant safety. This brochure outlines action steps so they can protect their school from the expense, inconvenience and health hazards associated with mercury spills. Defines what is mercury, mercury sources and why it is a health concern.*

### **“Reducing Mercury in Schools - Health and Safety Committees”**

*Identifies what is mercury, health concerns and where it is located throughout schools. It includes action steps specific to support school administrators in their mercury management efforts.*

### **“Facility-Wide Inventory of Mercury and Mercury-Containing Devices”**

*A tool that schools can use to systematically identify mercury and mercury-containing devices in various locations throughout their school.*

### **“Disposal and Recycling Options for Mercury and Mercury-Containing Devices”**

*Provides tips how to properly manage and recycle mercury and mercury-containing devices in accordance with New York State’s Department of Environmental Conservation’s hazardous waste regulations.*

### **“Guidelines for Cleanup of Mercury Spills”**

*Step-by step instructions for cleaning up small mercury spills. Also includes instructions for the proper disposal and recycling of the waste as part of a school’s spill response plan.*

The purpose of these brochures was to raise awareness about the problem of mercury in schools and provide concrete action steps. DOH distributed well over 100,000 brochures (10,000 packets) of these brochures to approximately 6,000 schools in New York State. (3,000 public schools in Upstate New York, 1,000 public schools in New York City and Downstate, 2,000 private schools throughout the state). DEC distributed approximately 350 of these mercury brochures packets at the five workshops held in the Hudson Valley region of the state. These materials were then distributed by workshop attendees to 503 schools located in the Hudson Valley.

In addition to the mercury brochures, the DEC developed many informational hand outs. Please refer to the “Attachments” page to review the list of these handouts. Copies of all of the aforementioned handouts are attached to the report (Attachment A.)

A mercury poster was also developed for our mercury outreach as a classroom aid to promote awareness of the hazards of mercury. The mercury poster is called “*Mean, Mad, Mercury*” and was also produced in Spanish, “*Mercurio, Loco, Loco*”. Ten-thousand (10,000) posters were produced: 8000 in English and 2000 in Spanish. Secondary school students were the target audience for this poster, as ten percent of mercury spills at school are caused by students. Approximately 500 posters were distributed at the Hudson Valley workshops.

Originally, DEC had contracted with the Orange-Ulster County Board of Cooperative Extension Services (BOCES) to conduct a demonstration project to reduce mercury at approximately 30 schools in the Hudson Valley Region. The anticipated benefit of this collaboration being that the BOCES demonstration project could be replicated by other BOCES districts throughout the state. BOCES is a public organization was created by the New York State Legislature in 1948, to provide shared education programs and services to school districts. BOCES helps school districts save money by providing opportunities to pool resources and share costs. Sharing is a very economical way for districts to provide programs and services that they might not be able to afford themselves.

Unfortunately, the Orange-Ulster BOCES was not able to meet their contractual commitment, resulting in DEC cancelling their contract. The DEC Pollution Prevention Unit decided, instead, to conduct five, half-day workshops in the Hudson Valley region, providing mercury awareness outreach to schools in the following counties: Columbia, Greene, Ulster, Orange, Sullivan, Dutchess, Putnam, Rockland and Westchester. These workshops were conducted in Castleton, Elmsford, New Paltz, Poughkeepsie and Harriman, from the time period November 14, 2006 thru January 31, 2007.

The goal of these workshops was to educate schools about the risks associated with mercury and to promote the elimination of mercury in schools. Our targeted audience for these mercury workshops were school administrators, science teachers, health and safety coordinators, building and grounds personnel and school nurses.

The workshops focused on teaching school personal how to identify, inventory, collect and remove/recycle elemental mercury and mercury-containing items from their schools. The workshops also included discussion about the health hazards associated with mercury exposure, and what to do in the event of a mercury spill. In addition, the workshops covered New York State mercury legislation and how to go about replacing their mercury-containing items with mercury-free alternatives.

The following agenda was developed and implemented at all five workshops, providing a consistent format to present detailed information about mercury to all workshop participants.

## **Mercury-Free Schools in New York State**

### **Agenda**

#### **Introduction: Why focus on getting mercury out of schools?**

- Numerous mercury spills at schools; clean-up expensive
- Mercury's health effects
- It's required by NYS law (i.e. Chapters 145, 676)
- Mercury elimination is a good progression to comprehensive chemical management

#### **Background information on mercury**

- Mercury's properties—why it is so useful
- Toxicity of mercury, neurological and developmental impacts
- Mercury cycle in the environment
- Sources of mercury
- Routes of exposure
- Fish advisories, FDA, NYDOH findings

#### **Where is mercury found in schools**

- Examples of mercury-containing items
- Where in schools mercury can be located
- Surprise locations

#### **Current New York State Mercury Legislation**

- Chapter 145
- Chapter 676

#### **Current New York State Environmental Regulations**

- Universal Waste Rule
- NYS Hazardous Waste Regulations

#### **Getting a mercury clean-out program started**

- Who to involve
- Coordinating a mercury team, elements for success
- Conducting the mercury inventory
- Collection materials needed
- Pitfalls to avoid
- Arranging the hazardous waste pick up
- How to save on costs
- Potential sources of funding

#### **Mercury Clean Outs in Rochester and Albany School Districts**

- A demonstration pilot

#### **Mercury-Free Alternatives**

- Examples and how they work
- Advantages/disadvantages
- Vendors

#### **Mercury Spills**

- Spill clean up guidance
- Hands on exercise

## **Workshop Attendance**

Attendance was modest, ranging from 10 to 26 people. Key players in the school administration were, however, represented, with each person disseminating the information they gained at these workshops to their school districts. The workshop's message, in all locations, had a greater impact than the attending numbers would indicate. In a large part, this was due to the

efforts from the health & safety officers from BOCES, who provide services to many schools districts in their respective counties.

For example, although there were only two BOCES health and safety officers in attendance in Castleton, they represented a total of 102 schools. In Elmsford, the BOCES health and safety officer present represented 152 schools. In New Paltz, the two BOCES health and safety officers represented 76 schools. In Poughkeepsie the BOCES health and safety officers that attended represented 114 schools. In Harriman, the BOCES health and safety officer present represented 136 schools.

The predominant audience in attendance for these workshops were buildings and grounds personnel, with a minority of the attendees divided amongst BOCES health and safety officers, science teachers, representatives from county solid waste authorities, county department of health representatives, school principals, business office administrators and DEC regional engineers.

Refer to “Attachment B” to review the attendee list from the aforementioned five workshops.

### **Outcomes from the Workshops:**

The following information was gathered from inputs from the mercury workshops, via workshop evaluations forms, audience comments and from a follow-up mercury workshop survey (10% response received from surveys).

#### **Castleton**

This workshop drew in schools representatives from Columbia, Greene, Albany and Rensselaer counties. With the exception of Albany County, the rest of the aforementioned counties are strongly agrarian and rural.

There was strong interest and many questions asked about the New York State Universal Waste Rule and Hazardous Waste Regulations at the workshop. There was general agreement by the participants that the workshop heightened their mercury awareness. The post-workshop follow-up revealed that most participants did distribute the information gathered at the mercury workshops to their school districts. If the workshop did not exactly spur many mercury clean out at schools in these counties, it did elicit interest in spurring some mercury inventorying.

#### **Elmsford**

The participants for this mercury workshop came from Putnam and Westchester counties. The schools in these counties range from urban (Yonkers) to strongly suburban Westchester to a mix of suburban and rural in Putnam county. Feedback from our workshop evaluations indicated a strong positive reaction to information gained from the mercury workshop and an increased awareness about the hazards of mercury in schools. Post-workshop contact with our BOCES contact in Westchester county indicated that some of the schools that attended the mercury workshop did go back and identified mercury at their schools, contacting the BOCES for information about removal. Feedback from the post-workshop mercury survey indicated that the information gathered at the workshop was distributed through the school districts. One school did report a mercury spill from a broken thermometer, which was properly cleaned up by the BOCES, assisted by training they received from our workshop.

## **New Paltz**

Participants for this mercury workshop represented school districts from predominantly rural Sullivan county to suburban/rural school districts from Ulster county in the Catskill mountain region, with one large city school district of note, in Kingston. Mercury awareness was definitely increased, leading to mercury clean outs in Ellenville, Rondout, Highland, New Paltz, Wallkill and Saugerties school districts.

It is estimated that about 10 pounds of mercury was removed from the aforementioned schools districts, these amounts including elemental mercury as well as mercury-containing equipment like a barometer, dozens of lab thermometers, a blood-pressure stand and some mercury compounds. The mercury poster, “Mean, Mad, Mercury was posted throughout the science labs at the Rondout secondary schools. It was noted that a few “older” science teachers, teetering on the edge of retirement, were resisting surrendering their mercury-containing devices, but the BOCES contact in New Paltz remarked that they were slated to be removed when the science teachers retired. Mercury-free replacements were purchased to put in place of mercury items removed, where appropriate (i.e. barometer, thermometers).

<b>Schools</b>	<b>Types and Quantity of Mercury-Containing Items</b>
New Paltz	Barometer Mercury Spill Kit 25-30 Lab Thermometers
Ellenville	Few pounds of Elemental Hg
Saugerties	Few pounds of Elemental Hg 12 thermometers Some mercury compounds
Wallkill	Florescent light bulbs
Rondout	5-6 pounds of Elemental Hg 50 to 60 Hg Lab Thermometers Mercury compounds Some science lab measuring devices

## **Poughkeepsie**

One of our largest workshops, attended by representatives from Dutchess county school districts, a predominantly rural county, with one notable large city school district, Poughkeepsie. Feedback from our workshop evaluations and follow-up survey indicated that mercury awareness was heightened and the mercury workshop handouts were distributed to the participant’s school districts. According to our BOCES contact, our mercury workshop did spur mercury clean outs at the Poughkeepsie, Red Hook, Pawling and Millbrook central school districts. It is estimated that on average, 8.7 pounds of mercury was cleaned out from each school, for an approximate total of 35 pounds of mercury removed. Additionally, the Dutchess County BOCES has been receiving many requests for information to obtain mercury-free alternatives.

Overall the response to our workshop was extremely positive by the participants. Many comments were received on how accessible and “to the point” our presentation was, providing the participants with a depth of information.

### **Harriman**

Participants who attended this workshop represented Orange and Ulster counties, mostly suburban, with a few rural school districts, the largest city school districts being Newburgh, Port Jervis and Middletown. Feedback from the workshop evaluations indicated a very positive response to the material being presented. Particular interest focused on the New York State hazardous waste regulations and the mercury spill exercise training. Comments from the follow-up mercury survey indicated that the mercury workshop did indeed spur mercury inventories and subsequent mercury clean outs from the Newburgh city, Pine Bush and the HFFM central school districts. Elemental mercury, mercury compounds and 60 mercury-containing lab thermometers were cleaned out from these schools..

The mercury workshop had a particularly strong impact on the Orange-Ulster BOCES coordinator of school health offices. Subsequently, a rigorous mercury removal campaign was conducted throughout the county’s school district’s nurses offices. Over 100 mercury-containing fever thermometers and many mercury-containing blood pressure cuffs were removed, enough to fill a 20-gallon drum. The mercury containing devices were replaced with mercury-free alternatives.

It is estimated that a total of 47 pounds of mercury was removed from the aforementioned schools and through the Orange-Ulster BOCES program.

### **Conclusion:**

The impact that these mercury workshops had on schools located in counties of the Hudson Valley region was quite positive. According to the mercury workshop follow surveys, almost every participant disseminated the mercury workshop information back to their school districts, heightening mercury awareness. When mercury clean outs did occur, mercury-free alternatives were purchased to replace mercury-containing devices that were removed. Although some mercury clean outs were directly inspired by participants from our mercury workshops; some schools had already been pro-active prior to attending our mercury workshop. Generally, most schools have cleaned out elemental mercury and some mercury compounds from their science rooms, mostly during routine chemical clean outs. There is still resistance from older science teachers to let go of their “stash” of mercury-containing devices.

Many of the mercury workshop participants expressed an overwhelming interest and need for worker safety training on how to handle hazardous substances, not just mercury. There was also strong interest in more depth and detailed information on managing fluorescent lamps. These subjects were touched on at the mercury workshop, but there was a definite gap between the depth of information we provided versus the depth of information that the participants were looking for. Overall, participants reacted very positively to our presentation, with strong preference for the New York State Universal Waste Rule and hazardous waste regulatory information. The mercury spill exercise was also rated quite highly. At almost all of the mercury workshops, a significant number of the participants admitted to having to deal with cleaning up a small mercury spill, usually a broken thermometer. Unfortunately, almost universally, these building and grounds personnel had little to no training on how to deal with a

mercury spill. Again, the role BOCES plays to assist these schools in their mercury clean out efforts is quite significant.

It was also quite useful to have DEC regional hazardous materials engineers on hand at each workshop location to contribute their knowledge of hazardous waste management options in their localities. Moreover, the workshop also served to heighten the DEC regional staff's mercury awareness on what is happening at their local schools districts, perhaps even leading to increased future compliance inspections.

Again, although attendance was relatively modest, the outreach effect was far larger in proportion for these school districts in the Hudson Valley region. We estimate that approximately 92 (does not include Elmsford) pounds of mercury was removed from schools in this region; mercury elimination that has directly resulted or strongly influenced by our outreach efforts through these mercury workshops. Eliminating mercury from these schools will have effect of protecting the health of school children, a population particularly sensitive to this potent neurotoxin, and diminish the potential for future mercury spills at schools and its inherent health risk associations.

## **Attachment A: List of Mercury Workshop Handouts**

- 1)** Mercury: Fact Sheet
- 2)** How to Initiate a Mercury Clean out in Your School
- 3)** Management of Mercury-Added Consumer Products in New York State
- 4)** Highlights on the Amendment Chapter 676
- 5)** Did You Know...Fluorescent Lamps Contain Mercury?
- 6)** Useful Links for Mercury Information
- 7)** Mercury and Schools: A Risky Combination - a series of brochures
- 8)** Inventory: Facility-wide Inventory of Mercury and Mercury-Containing Devices
- 9)** “Mean, Mad Mercury” poster
- 10)** “Mercurio Loco Loco” poster
- 11)** Article Reprint, “*Get the Mercury Out*”, The Conservationist Magazine, February 2007 issue



## Attachment B: Attendee List

Location of Workshops	Number of People	Types of People/Organizations Represented	Number of Schools/School Districts Represented	Counties Reached
Castleton	10	<p><b>Health &amp; Safety Coordinators</b></p> <ul style="list-style-type: none"> <li>- Capital Region BOCES</li> <li>- Questar BOCES</li> <li>- Albany City School District</li> </ul> <p><b>Buildings &amp; Grounds</b></p> <ul style="list-style-type: none"> <li>- Lansingburg SD</li> <li>- Brunswick SD</li> <li>- Coxsackie-Athens CSD</li> <li>- Catskill CSD</li> </ul> <p><b>NYSDEC - Region 4</b></p> <ul style="list-style-type: none"> <li>-Solid &amp; Hazardous Waste Engineer</li> </ul> <p><b>NYSDEC -Albany-Division of Solid &amp; Hazardous Materials</b></p> <ul style="list-style-type: none"> <li>-Environmental Specialist</li> </ul>	102 schools	Greene Columbia Rensselaer
Elmsford	22	<p><b>Health &amp; Safety Coordinators</b></p> <ul style="list-style-type: none"> <li>-Southern Westchester BOCES</li> </ul> <p><b>Building &amp; Grounds</b></p> <ul style="list-style-type: none"> <li>- Eastchester SD</li> <li>- Brewster SD</li> <li>- Dobbs Ferry SD</li> <li>- Ardsley SD</li> <li>- Briarcliff Manor SD</li> <li>- Mamaroneck SD</li> <li>- White Plains SD</li> <li>- Harrison CSD</li> <li>- Yonkers SD</li> </ul> <p><b>Science Teachers</b></p> <ul style="list-style-type: none"> <li>- Edgemont HS</li> <li>- Biondi Education Center</li> </ul> <p><b>NYSDEC- Region 3</b></p> <ul style="list-style-type: none"> <li>- Solid &amp; Hazardous Waste Engineers</li> </ul>	152 schools	Putnam Westchester
New Paltz	13	<p><b>Health &amp; Safety Coordinators</b></p> <ul style="list-style-type: none"> <li>- Ulster BOCES</li> <li>- Sullivan BOCES</li> </ul> <p><b>Building &amp; Grounds</b></p> <ul style="list-style-type: none"> <li>- Ellenville CSD</li> <li>- Roundout Valley SD</li> <li>- Saugerties CSD</li> <li>- Wallkill SD</li> </ul> <p><b>Science Teachers</b></p> <ul style="list-style-type: none"> <li>- Saugerties CSD</li> </ul> <p><b>Business Administrator</b></p> <ul style="list-style-type: none"> <li>- Ellenville CSD</li> </ul> <p><b>NYSDEC- Region 3</b></p> <ul style="list-style-type: none"> <li>- Solid &amp; Hazardous Waste Engineers</li> </ul>	76 schools	Sullivan Ulster

Location of Workshops	Number of People	Types of People/Organizations Represented	Number of Schools/School Districts Represented	Counties Reached
Poughkeepsie	26	<p><b>Health &amp; Safety Coordinators</b> - Dutchess County BOCES</p> <p><b>Building &amp; Grounds</b> - Red Hook CSD - New Paltz CSD - Hyde Park SD - Pawling CSD - Rhinebeck CSD - Millbrook CSD - Door Schools - Pine Plains CSD</p> <p><b>Science Teachers</b> - ACSD</p> <p><b>Dutchess County Health Officer</b> - Dutchess County Health Department</p> <p><b>Dutchess County Senior Public Health Sanitarians</b> - Dutchess County Health Department</p> <p><b>Dutchess County Recycling Coordinator</b> Dutchess County Recycling Recovery Assoc.</p> <p><b>NYSDEC- Region 3</b> - Solid &amp; Hazardous Waste Engineers</p>	114	Dutchess
Harriman	15	<p><b>Health &amp; Safety Coordinators</b> - Orange-Ulster BOCES</p> <p><b>Building &amp; Grounds</b> - Pine Bush CSD - Port Jervis SD - HFFM CSD - Minisink SD - Newburgh SD</p> <p><b>Solid Waste Educator</b> - Rockland County Solid Waste Authority</p> <p><b>NYSDEC- Region 3</b> - Solid &amp; Hazardous Waste Engineers</p>	136	Orange Ulster Rockland