Health Consultation

WAKEFIELD-MARENISCO SCHOOL MERCURY SPILL

WAKEFIELD, GOGEBIC COUNTY, MICHIGAN

AUGUST 4, 2008

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

WAKEFIELD-MARENISCO SCHOOL MERCURY SPILL

WAKEFIELD, GOGEBIC COUNTY, MICHIGAN

Prepared By:
Michigan Department of Community Health
Under Cooperative Agreement with the
The U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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Summary

A mercury-bearing thermometer was broken in a school classroom in Wakefield, Michigan. The local health department requested technical assistance and expertise from the state health department during the response and subsequent cleanup. The mercury release posed a public health hazard until the remediation was complete. It currently poses no apparent public health hazard. The classroom was not used until the cleanup was complete. Other mercury-containing instruments and chemicals were removed and disposed of during cleanup, but the state health department has asked school officials to conduct a complete audit of the building to ensure no items remain.

Purpose and Health Issues

The purpose of this health consultation is to document assistance provided by the Michigan Department of Community Health (MDCH) during and after a mercury release at Wakefield-Marenisco School, in Wakefield (Gogebic County), Michigan (Figure 1). The Western Upper Peninsula District Health Department (WUPDHD), the local health agency, oversaw the response and cleanup of the spill and requested assistance from MDCH in appropriately directing cleanup efforts, interpreting mercury vapor levels and blood testing results, and reviewing the contractor's summary report.

MDCH conducted this health consultation for the federal Agency for Toxic Substances and Disease Registry (ATSDR) under a cooperative agreement. ATSDR conducts public health activities (assessments/consultations, advisories, education) at sites of environmental contamination and concern. ATSDR is primarily an advisory agency. Therefore, its reports usually identify what actions are appropriate to be undertaken by the regulatory agency overseeing the site, other responsible parties, or the research or education divisions of ATSDR. As such, ATSDR recommendations may not encompass all types of federal and state requirements from a regulatory perspective.

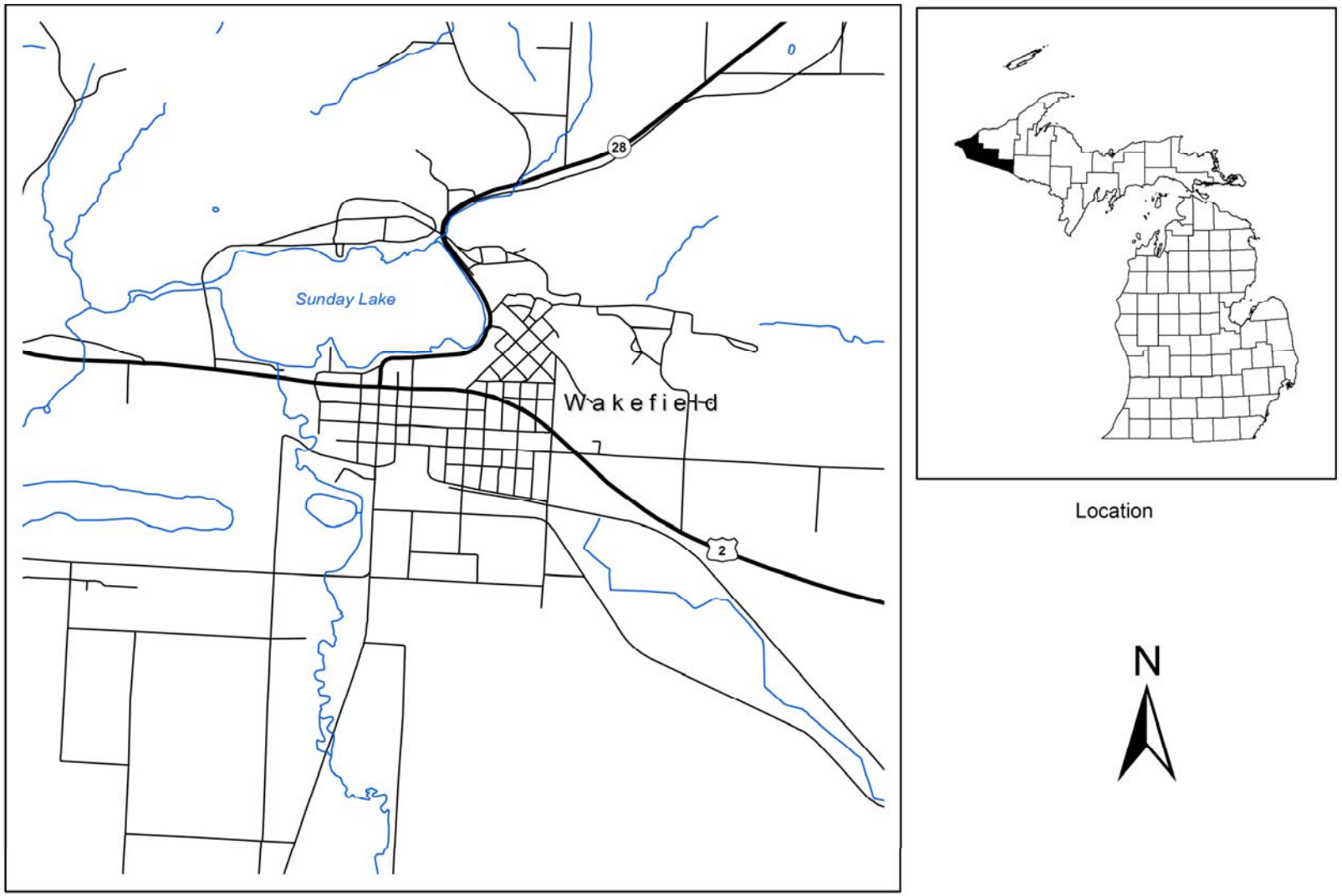
Event and Response

On Thursday, April 17, 2008, the MDCH Toxicology and Response Section received a phone call from the environmental health director at the WUPDHD. The local health agency stated that there had been a mercury release the previous afternoon in the Life Skills classroom at the Wakefield-Marenisco school in Wakefield, Gogebic County. At about the same time as the phone call, MDCH also received notification of the release from the state's Pollution Emergency Alerting System, stationed at the Michigan Department of Environmental Quality.

Initial readings with a Lumex "Lite" mercury vapor analyzer indicated that mercury vapor levels in the classroom ranged from 1 to 10 micrograms per cubic meter ($\mu g/m^3$). The school had contacted a cleanup contractor. School officials cancelled classes for Friday, April 18.

The school bagged shoes of the students who had been in the classroom to test for contamination. One of the students had intentionally rolled in the mercury beads on the floor (likely mimicking a video on the internet that shows a worker floating in a large pool of mercury). The student's clothes were bagged and tested. Readings of the headspace in the bags of shoes and clothes indicated mercury levels of 4-72 $\mu g/m^3$. WUPDHD recommended that this student, and three others who had handled the beads, get blood testing for mercury exposure

Figure 1. Wakefield (Gogebic County), Michigan and vicinity



(results under "Children's Health Considerations") and asked MDCH for information on interpreting the results. MDCH sent the local health agency the section from the ATSDR Toxicological Profile for Mercury regarding biomarkers of exposure.

Testing of the floor in front of the students' lockers in the hallway did not indicate elevated mercury readings. The janitor's floor scrubber, which was used in the hallway but not the affected classroom, suggested some contamination of the machine. MDCH suggested that the exhaust from the machine be screened for mercury vapor levels while the machine was running, to determine potential exposure to the janitor.

After conferring with WUPDHD and school officials, the cleanup contractor went through several rounds of removing visible mercury, vacuuming with a mercury vacuum, and alternately heating and venting the room. The contractor then performed after-testing, using the recommended NIOSH 6009 method. MDCH provided WUPDHD the method protocol upon request. Typically, this air-sampling test is run for approximately 8 hours, collecting 100 liters of air (NMAM 1994). The contractor ran the test for 2.5 hours, collecting 30 L air, which increased the detection limit (made it less reliable). The NIOSH test did not detect any remaining mercury (detection limit of 2 $\mu g/m^3$). After reviewing the results of the test (TriMedia Consultants 2008), MDCH suggested that WUPDHD verify room temperature during the air sampling (Appendix A). Room temperature was 72-75° F, indicating that any mercury present would vaporize sufficiently to be detected.

Discussion

Environmental and Personal Property Contamination

MDCH suggests the following screening values when conducting a mercury spill investigation (these values may be adjusted dependent on exposure scenarios):

Table 1. Screening values to consider when conducting a mercury spill investigation.

Concentration ($\mu g/m^3$)	**Suggested Action**
< 1	Contaminated item is acceptable to keep. Residential settings may be reoccupied, provided all sources of released mercury have been removed and ventilation has occurred.
<3	Non-residential settings (schools, clinics, workplaces) may be reoccupied, provided all sources of released mercury have been removed and ventilation has occurred.
1-10	Dispose of porous materials (upholstered furniture, carpet, clothing). Valued items (heirlooms) can be aired out in a non-living area (outside is best) and re-screened several weeks or months later. Hard surfaces (bare floors, wooden furniture) can be cleaned.
>10	People not directly involved in the cleanup should not be present.

Reference: MDCH 2007

At the Wakefield-Marenisco School mercury spill event, several articles of clothing and pairs of shoes were found to have unacceptable levels of mercury on them and were discarded (TriMedia Consultants 2008).

During re-screening after cleanup activities, WUPDHD found some readings to be unacceptable and directed the contractor to address those areas still contaminated (TriMedia Consultants 2008).

Exposure Pathways Analysis and Toxicological Evaluation

To determine whether persons are, have been, or are likely to be exposed to contaminants, MDCH evaluates the environmental and human components that could lead to human exposure. An exposure pathway contains five elements:

- a source of contamination
- contaminant transport through an environmental medium
- a point of exposure
- a route of human exposure
- a receptor population

An exposure pathway is considered complete if there is evidence, or a high probability, that all five of these elements are, have been, or will be present at a site. It is considered either a potential or an incomplete pathway if there is no evidence that at least one of the elements above are, have been, or will be present, or that there is a lower probability of exposure. Table 2 shows the exposure pathway of most concern (inhalation) at the Wakefield-Marenisco School mercury spill.

Table 2. Analysis of inhalation exposure pathway at the Wakefield-Marenisco School, Wakefield, Michigan mercury spill site.

Source	Environmental Transport and Media	Chemical of Interest	Exposure Point	Exposure Route	Exposed Population	Time Frame	Exposure Status
Broken mercury thermometer	Indoor air	Elemental mercury	Air	Inhalation	Students, teachers, other school staff; family members of the above	Past	Complete
						Present	Incomplete
						Future	Potential
NOTE: The presence of a complete exposure pathway in this table does not imply that an exposure would be substantive or that an adverse health effect would occur.							

The main routes of exposure for elemental mercury are ingestion (swallowing the beads), dermal (skin) absorption, and inhalation of mercury vapors. Of the three, inhalation is the most hazardous route, particularly to children and women of childbearing age. Inhalation of high levels of elemental mercury can cause permanent neurological (brain) damage and kidney impairment (ATSDR 1999).

ATSDR recommends that breathing-zone mercury levels not exceed 3 $\mu g/m^3$ in non-residential settings. Dependent on the exposure scenario, this "action" level can be adjusted to be higher or lower. If the action level is exceeded, further cleanup or other remedial action may be necessary. This recommended level is based on both animals studies and human epidemiology studies that describe the health effects of inhalation of mercury-contaminated air (ATSDR 1999, 2000).

Health department personnel involved in the Wakefield-Marenisco School mercury spill were most concerned about inhalation exposure to mercury vapors in the Life Skills classroom. Because the response to the spill was prompt, it is likely that no one was exposed for more than a very short period, perhaps a few hours at most, to concentrations of mercury that could result in health effects. However, continued exposure could have resulted in negative health consequences, making it imperative that a thorough cleanup be conducted. Although cleanup has occurred, there may be other mercury-bearing items in the school that have not yet been discovered and removed. Therefore, the risk of a future mercury spill is not eliminated.

Children's Health Considerations

In general, children may be at greater risk than adults from exposure to hazardous substances at sites of environmental contamination. Children engage in activities such as playing outdoors and hand-to-mouth behaviors that could increase their intake of hazardous substances. They are shorter than most adults, and therefore breathe dust, soil, and vapors found closer to the ground. Their lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. The developing body systems of children can sustain permanent damage if toxic exposures are high enough during critical growth stages. Fetal development involves the formation of the body's organs. Injury during key periods of prenatal growth and development could lead to malformation of organs (teratogenesis), disruption of function, and premature death. Exposure of the mother could lead to exposure of the fetus, via the placenta, or affect the fetus because of injury or illness sustained by the mother (ATSDR 1998). The obvious implication for environmental health is that children can experience substantially greater exposures to toxicants in soil, water, or air than adults can.

The younger a child is, the more vulnerable he is to the toxic effects of mercury. Although the Life Skills classroom held high school students (teenagers) at the time of the spill, a kindergarten class reportedly was in the room next door. If younger students had come into contact with the mercury and brought it home on their shoes or clothes, or if older students with younger siblings had brought contaminated items home, prolonged exposure could have occurred, possibly leading to harmful effects.

The blood testing on the four students reported non-detectable levels in three of the students (L. Tarbutton, WUPDHD, personal communication, 2008). The fourth student's blood mercury level was 1 nanogram per milliliter (ng/ml), which is within the levels found in the general population (1-8 ng/ml; ATSDR 1999) and not a health concern. To our knowledge, no pregnant women were exposed to the mercury vapors.

In a 2007 survey issued by the Michigan Department of Education (MDE), school officials at the Wakefield-Marenisco School had reported the school being mercury-free. Beginning December 31, 2004, it became state law that Michigan's public and private K-12 schools eliminate elemental mercury and mercury-containing instruments from their buildings (PA 376 2000). MDCH has been partnering with MDE in recent years to ensure that schools are compliant with this law.

Community Health Concerns

MDCH has not been contacted by any community members (parents, teachers, other school staff) regarding this event.

Conclusions

The mercury spill in the Wakefield-Marenisco School posed a public health hazard until remediation took place. Due to the acute (short) duration of exposure, it is not likely that children or others would have experienced adverse health effects. Currently, although there may be some vapors clearing from the building, the concentrations are within MDCH/ATSDR acceptable limits and there is no apparent public health hazard.

Recommendations

1. Isolate contaminated room until cleanup is verified.

2. Remove all remaining mercury-bearing devices from the school.

Public Health Action Plan

1. WUPDHD had school officials keep the Life Skills classroom closed from use until the agency was satisfied that the remediation was sufficient. (Classroom reopened May 1, 2008.)

2. The cleanup contractor removed and disposed of other mercury-bearing thermometers and several containers of mercury oxide during the cleanup (TriMedia Consultants 2008).

3. MDCH issued a letter to school officials, requesting that they conduct a full audit and clean-out of mercury-bearing instruments in the school (Appendix B).

MDCH will remain available as needed for future consultation at this site.

If any citizen has additional information or health concerns regarding this health consultation, please contact MDCH's Division of Environmental Health at 1-800-648-6942.

Preparers of Report

Michigan Department of Community Health
Division of Environmental Health

Christina Bush, Toxicologist
Toxicology and Response Section

ATSDR Region 5 Office

Mark Johnson
Office of Regional Operations

ATSDR Division of Health Assessment and Consultation

Trent LeCoultre, Technical Project Officer
Cooperative Agreement Program Evaluation Branch

References

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Public Act (PA) 376. 2000. Enrolled Senate Bill 1262 concerning mercury phase-out in schools. Section 380.1274b of Act 451 of 1976. http://www.legislature.mi.gov/(S(mb5vtijawmn45mrlkrfv1v45))/mileg.aspx?page=getObject&objectName=mcl-380-1274b

TriMedia Consultants. "Summary Report: Mercury Spill Response at the Wakefield-Marenisco School in Wakefield, Michigan. TriMedia Project Number 28-050." Marquette (MI): TriMedia Consultants; April 28, 2008.

Certification

This **Wakefield-Marenisco School Mercury Spill** Health Consultation was prepared by the Michigan Department of Community Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures. Editorial review was completed by the cooperative agreement partner.

Technical Project Officer, Cooperative Agreement Program Evaluation Branch (CAPEB), Division of Health Assessment and Consultation (DHAC), ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

Team Leader, CAPEB, DHAC, ATSDR

Appendix A. Letter to Western Upper Peninsula District Health Department dated April 29, 2008, concerning Wakefield-Marenisco School mercury spill cleanup consultant's report.

STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

JANET OLSZEWSKI
DIRECTOR

April 29, 2008

Lynne Tarbutton, Environmental Health Director
Western Upper Peninsula District Health Department
540 Depot
Hancock, MI 49930

Dear Ms. ~~Tarbutton~~ Lynne:

Per your request, I have reviewed the following documents regarding the elemental mercury release at the Wakefield-Marenisco School in Wakefield, Gogebic County:

- Wakefield TriMedia Report.pdf (*Summary Report* – Mercury Spill Response at the Wakefield-Marenisco School in Wakegield, Michigan; TriMedia Project Number 28-050)
- Wakefield 4-28-08.doc (letter from you to TriMedia regarding post-response readings missing from the *Summary Report* and request for parameters measured during the NIOSH 6009 after-testing)
- Wakefield TriMedia Test Meom [sic].pdf (follow-up memo to you from TriMedia regarding NIOSH 6009 Method parameters)

I have several comments on these documents:

1. On page 3 of the *Summary Report*, in the final paragraph, the discussion refers to the mercury vapor levels acceptable for reoccupancy as "MDCH regulations." These levels, 1,000 ng/m^3 for residential settings and 3,000 ng/m^3 for occupational settings, are *not* regulatory numbers. Rather, they are health-based recommendations provided to MDCH by the federal Agency for Toxic Substances and Disease Registry (ATSDR), part of the U.S. Department of Health and Human Services. These values may be adjusted, up or down, dependent on the scenario. Based on my professional judgment, you were justified in insisting that the readings be lower, since the school houses not only teenagers but younger children, with, according to my notes, a kindergarten class in the room adjacent to that where the mercury release occurred. Younger children are more vulnerable to the toxic effects of mercury than are older children and adults.

2. Following Table 6 in the *Summary Report*, the NIOSH 6009 results are presented. You had discussed with me your concerns regarding the length of time the samplers should run. According to the follow-up memo that TriMedia sent you, the sampling rate was 0.2 L/min for a total volume of 30 L. This means that the samplers ran for 150 minutes (2.5 hrs). While a student may not be in the Life Skills room for more than one or two class periods per day, a shorter sampling time or smaller volume decreases the sensitivity of the test. If the samplers had run until the maximum recommended total volume was collected (100 L, taking about 6.7 hrs at the same rate), one would then divide the amount of mercury detected by 100 instead of 30. That

means the detection limit would have gone from 2.02 $\mu g/m^3$ (or 2,020 ng/m^3) to 0.61 $\mu g/m^3$ (or 610 ng/m^3), resulting in increased assurance that there were no intermittent spikes of mercury vapor that would suggest some remaining beads.

3. In your letter to TriMedia, you requested not only air sampling details during the NIOSH 6009 after-testing but also the temperature of the room while the after-testing was being conducted. I did not see room temperature stated in TriMedia's follow-up memo. I suggest verifying that room conditions reflected normal use and that the windows were not open, so that the temperature was sufficient to vaporize any residual mercury. If the room was warm enough, then I find the results from the NIOSH 6009 acceptable.

I also want to comment on several issues regarding this event. First, it appeared that you were being pressured to accept cleanup conditions you were not comfortable with, primarily in reference to item #1 above. MDCH is happy to provide guidance and technical assistance in public health issues handled by local health departments. Ultimately, it is the local health department's decision when a public building in their jurisdiction can be reoccupied following a mercury release and cleanup.

Second, according to our records, Wakefield-Marenisco School reported being mercury-free in last spring's School Infrastructure Database survey by the Michigan Department of Education. I am sending a letter to the school principal, copying the superintendent and the health officer for your health department, requesting that another audit and clean-out be conducted for mercury-bearing items in the building.

Lastly, I will be documenting MDCH's involvement in this event in what is called a "Health Consultation." The release of mercury at Wakefield-Marenisco School posed a public health hazard until it was remediated. ATSDR asks, after the state health department provides technical assistance when a public health hazard exists, that we document events formally. The review and finalization of the health consultation may take between one and two months. I will provide a copy to you when it becomes available.

Finally, Lynne, I'm happy to have a strong mercury spill-response presence in the Western U.P. District. Without capable local health departments and other responders in the field, mercury spills might not be attended to completely or efficiently.

Please let me know if you need further assistance with this matter.

Sincerely,

Christina Rose Bush

Christina Bush, Toxicologist
Toxicology and Response Section
Division of Environmental Health
Bureau of Epidemiology

517-335-9717 or 800-648-6942
bushcr@michigan.gov

Appendix B. Letter to Wakefield-Marenisco School dated April 29, 2008, concerning mercury spill.

STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

JANET OLSZEWSKI
DIRECTOR

April 29, 2008

Carrie Nyman, Principal
Wakefield-Marenisco School
715 Putnam St.
Wakefield, MI 49968

Dear Ms. Nyman:

The Wakefield Marenisco School experienced an elemental mercury release on April 16, 2008 when a mercury-bearing thermometer was broken in the "Life Skills" class. Lynne Tarbutton and Tanya Halquist from the Western Upper Peninsula District Health Department oversaw the response and clean-up, with technical assistance from the Toxicology and Response Section of the state health department.

According to our records, your office reported the school to be mercury-free as of the most recent Michigan Department of Education (MDE) School Infrastructure Database survey. Beginning December 31, 2004, it became state law that Michigan's public and private K-12 schools eliminate elemental mercury and mercury-containing instruments from their buildings. The Michigan Department of Community Health has been partnering with MDE in recent years to ensure that schools are compliant with this law.

This incident suggests that you need to conduct another audit to determine if there still are mercury sources that need to be removed from the school. Please take the time now to conduct a mercury audit of your building. Mercury might be stored in chemical or art supply cabinets, other classrooms, kitchen areas, custodial or maintenance areas, the nurse's station, or even in business offices. It is my understanding that TriMedia Consultants, the company that performed the cleanup, removed several mercury-bearing items from the school during its work (thermometers, mercuric oxide, contaminated items from the spill). There may be additional sources of mercury that could have been missed. See the enclosed form for guidance with the audit and subsequent elimination of any mercury-bearing items.

CAPITOL VIEW BUILDING • 201 TOWNSEND STREET • LANSING, MICHIGAN 48913
www.michigan.gov • (517) 373-3740

Thank you for your attention to this matter.

Sincerely,

Christina Rose Bush

Christina Bush, Toxicologist
Toxicology and Response Section
Division of Environmental Health
Bureau of Epidemiology

(517) 335-9717 or (800) 648-6942
bushcr@michigan.gov

Enclosure

CC: Guy St. Germain, Health Officer/Administrator, Western U.P. District Health Dept.
Larry Kapugia, Superintendent, Wakefield-Marenisco School District

Michigan Department of Community Health

MDCH

Jennifer M. Granholm, Governor
Janet Olszewski, Director

Keep our kids safe: Steps to Eliminate Mercury in Michigan K-12 Schools

Under Public Act 376 of 2000, Michigan's public and private K-12 schools were required to have eliminated elemental mercury and mercury-containing instruments by December 31, 2004. **If your school is not yet in compliance with this law, you should follow this guidance to complete the mercury elimination process.**

Mercury is a powerful neurotoxin. Because it is a liquid at room temperature, and it vaporizes quickly, children can easily be exposed to hazardous amounts from open jars or mercury spills. Elimination of mercury and mercury-containing instruments will prevent costly and time-consuming mercury spill clean-up. Elemental mercury and mercury-containing instruments are most often found in classrooms and health offices.

Earlier this year a mercury thermometer broke in a science classroom: it cost the school over $2000 to clean up the spill, and days of staff time to address parents' concerns. The school has since become mercury-free!

This document outlines steps a school can take to ensure that it is mercury-free. For more detailed instructions, go to www.michigan.gov/deqmercuryinschools and click on "Mercury Elimination Guidelines for Michigan Schools."

Step 1: Set up an administrative process

Support should be obtained from upper management. There may be cost saving opportunities if other schools in your school district are also completing this process and work together cooperatively. Typically a formal directive or memorandum is issued, which identifies a lead for overseeing the mercury reduction process.

Step 2: Conduct a mercury audit

Science, chemistry, biology and physics classrooms and the school health office should be the primary focus. Art and home economics classrooms may also have mercury. An inventory checklist, on page 4 of this document, will assist in identifying mercury sources.

Mercury items to be eliminated according to PA 376

Free-flowing Liquid Elemental Mercury and Mercury-containing Instruments including, but not limited to:

- Mercury Thermometers
- Mercury Fever Thermometers
- Mercury Barometers
- Mercury Manometers
- Sphygmomanometers *(blood pressure devices with silver-colored liquid)*

Step 3: Develop a cost analysis and implementation plan

The cost analysis estimates expenses for handling, packaging, transporting, and recycling, as well as costs for replacing mercury devices with mercury-free alternatives. Contact the recycling sites (see step 6 below) to determine costs and shipping/handling requirements before choosing one or more sites for your program.

A written timetable and approval from authorities for necessary expenditures will ensure success.

Step 4: Communicate the plan

Science teachers, nurses and others need to understand the process. They also need to know how to handle mercury spills. Having a mercury spill kit in the school is recommended in case a spill occurs while making your school mercury-free. For more information about spill clean-up, visit www.michigan.gov/deqmercuryp2. Under the "Mercury Spills" heading, click on "Spill Cleanup Kits."

To Contain a Mercury Spill:

Immediately **restrict traffic** in the spill zone area.
Never vacuum up a mercury spill.
Contain the spill as best as possible.
Call 1-800-MI-TOXIC (800-648-6942)
for further instructions.

Never throw mercury or mercury-laden articles in the trash or pour mercury down the drain.

Step 5: Consolidate the mercury

Move all items on the inventory to a locked, secure location within the building, preferably after hours. Have the mercury spill kit on hand. Place elemental mercury and mercury instruments sorted by type of device in unbreakable containers such as plastic food storage containers, and then place or wrap the container in another plastic container (e.g. large plastic zipper-type freezer bag or clear plastic trash bag).

Step 6: Identify a recycler

Visit the DEQ's website at www.michigan.gov/deqmercuryp2. Under the "Mercury Spills" heading, click on "Where to Take Mercury and Mercury Containing Devices."

Note!	Michigan's Groundwater Stewardship "Clean Sweep" Program sites accept mercury from schools **free of charge**. To find a site near you, follow the links above and click on the first option: "Mercury and Pesticide Drop-off Sites - (Clean Sweep Contacts)."

Step 7: Determine handling and transport method

How you transport the materials to the disposal site depends on many factors, including mercury amounts and whether the mercury is managed as "universal" or "hazardous waste." The transportation requirements can sometimes be complex.

- Your school may choose to transport the mercury simply by packing the containers carefully to avoid any spills and driving the material to the disposal/recycling site yourself. While this is the least expensive method, potential liabilities should be considered. For details, go to www.michigan.gov/deqmercuryinschools and click on "Mercury Elimination Guidelines for Schools."

- In general, shipping the material through the U.S. Postal Service is not allowed. Shipping using United Parcel Service, Fed Ex or other shippers is difficult because of their stringent requirements about shipping mercury.

- If your school already uses a hazardous waste contractor or hauler, you may want to consult them regarding disposal of your mercury.

Step 8: Adopt mercury-free purchasing policies

It makes little sense to rid a school of mercury, only to have new mercury instruments reappear in the future. Having purchasing policies in place, informing venders, removing mercury products from catalogs, and educating staff on this policy should ensure success in the future.

Step 9: Receive recognition for your achievement!

Inform the State of Michigan that the process of mercury elimination was completed by e-mailing Noreen Hughes at hughesn@michigan.gov or Martha Stanbury at stanburym@michigan.gov, or by calling 1-800-MI-TOXIC (800-648-6942). Your school will be added to the list of mercury-free schools at www.michigan.gov/deqmercuryinschools.

Checklist for Inventory of Mercury in School Classrooms and Health Offices

Item	No	Yes	How used?	How Many/ How Much?	Location?
Science, Chemistry, Physics, Biology Rooms					
Elemental Mercury					
Mercury Thermometers					
Mercury Barometers					
Mercury Vacuum Gauges					
Hg Spectral Tubes					
Mercury Molecular Motion Device					
Mercury Sling Psychrometer					
Mercury Compounds					
Mercury oxide					
Mercury (II) chloride					
Mercury (II) sulfate					
Mercury nitrate					
Mercury iodine					
Zenker's Solution					
Other Mercury Materials					
Home Economics & Art					
Mercury Cooking Thermometer					
True Vermillion Paint (contains mercuric sulfide)					
Cadmium Vermillion Red					
Medical					
Mercury Fever Thermometers					
Sphygmomanometers (Blood Pressure Devices with silver liquid)					

Note: Other mercury-containing items found in buildings, such as thermostats, light switches, relays, electrical contractors, and fluorescent lights, are not specifically listed in this legislation. However, it is recommended that, as these products reach the end of their useful lives, they be replaced with mercury-free alternatives if available.