



Metallic Mercury Vapor Monitoring at Morris Ave, Bronx, NY

Raj Singhvi
 Environmental Response Team Center
 U. S. Environmental Protection Agency
 Edison, NJ 08837

Jay Patel, and Amy Dubois
 Response Engineering and Analytical Contract/Lockheed Martin, Inc.
 Edison, NJ 00837



Abstract

In March 2001, a seven-year-old girl spilled metallic mercury near the window sill of her apartment at Morris Avenue, the Bronx, New York. The child later got sick and was showing symptoms of mercury poisoning such as; vomiting, skin discoloration, hair loss, and weight loss. At first the child was diagnosed with “scarlet fever” and was given penicillin. When the child’s conditions worsened, additional tests were done and mercury was detected in her blood, urine and hair. Due to the elevated level of mercury detected in the blood, the child was admitted to the Bellevue Hospital on June 19, 2001.

At the request of the New York City Department of Health (NYCDOH), the USEPA Environmental Response Team (ERT), with the assistance of the Response Engineering and Analytical Contract (REAC), conducted air monitoring using real time mercury analyzers and the NIOSH 6009 method for residual metallic mercury vapors in the apartment after the cleanup operation was conducted during the month of July 2001. The indoor air monitoring results showed the presence of metallic mercury vapors in the range of 1.1-3.6 $\mu\text{g}/\text{m}^3$ in the child’s bedroom and in the living room. These two rooms were cleaned up by the NYDEC contractor. Additionally, 5.3 $\mu\text{g}/\text{m}^3$ of mercury was detected in the grandmother’s bedroom, which was not cleaned up by the contractor.



Figure-1
Drums of Mercury-Contaminated Household Contents in the Child's Bedroom

Figure-2
Mercury Measurement in Living Room



Real-Time Mercury Monitoring (Lumex and Tracker) and Air Sampling

Real time monitoring and air sampling were performed on the following days:

- August 1, 2001 (After NYDEC contractor cleaned up the apartment)
- August 16, 2001 (After 55 gallon drums with the contaminated material removed from the apartment)
- September 6, 2002 (after additional venting and removing additional contaminated material from the apartment)

Table 1
Real Time Mercury Monitoring Results $\mu\text{g}/\text{m}^3$

Sampling Location	8/1/01	8/16/01	9/6/01
Child Bedroom	1.1 – 3.5	0.4	1.2-1.5
Living Room	1.1 – 2.7	0.3	NA
Grandma Bedroom	1.4 – 3.0	4.4 – 6.0	NA

NIOSH 6009 Mercury Analysis Results* $\mu\text{g}/\text{m}^3$

The indoor air monitoring results showed the presence of metallic mercury vapors in the range of 1.1-3.6 $\mu\text{g}/\text{m}^3$ in the child’s bedroom and in the living room. These two rooms were cleaned up by the NYDEC contractor. Additionally, 5.3 $\mu\text{g}/\text{m}^3$ of mercury was detected in the grandmother’s bedroom, which was not cleaned up by the contractor.

Real-Time Mercury Monitoring Results

- Mercury was detected in real time in the range 0.4 - 6.0 $\mu\text{g}/\text{m}^3$ in the apartment
- No visible metallic mercury was detected

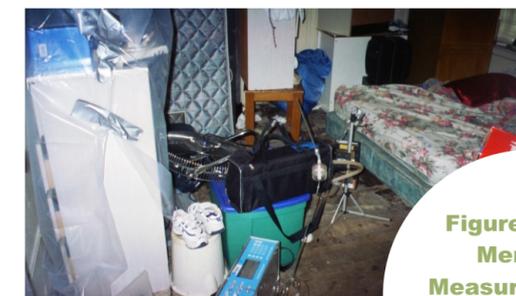
Table 2
NIOSH 6009 Mercury Analysis Results* $\mu\text{g}/\text{m}^3$

Sampling Location	8/1/01	8/16/01	9/6/01
Child Bedroom	3.3	1.2	2.0
Living room	3.6	1.1	2.2
Grandma Bedroom	5.3	2.6	5.3

* Average of multiple measurements

Conclusions

The mercury vapor monitoring results indicate the presence of residual mercury in the apartment. The ERTC recommended to NYDOH to use mercury clean up procedures to meet the action level of minimum 1.0 $\mu\text{g}/\text{m}^3$.



Figures-3 & 4
Mercury Measurement in the Grandmother's Bedroom



Acknowledgments and Disclaimer

The authors wish to thank Dennis Kalnicky of REAC for his technical support and Charles Gasser of REAC for his analytical support. The analytical methods described here were modified/developed to meet U.S. EPA/ERT/REAC field and laboratory requirements for monitoring indoor metallic mercury vapor and may not be applicable to the activities of other organizations. Mention of trade names or commercial products does not constitute endorsement or recommendation for use. The work was performed under contract with Lockheed Martin Inc. (contract no. 68-C99-223).