

PILOT STUDY TEST RESULTS 2010

In January, 2010, New York City entered into a consent agreement with the U.S. Environmental Protection Agency (EPA) to conduct a pilot study of five (5) New York City school buildings. The goals of this pilot study are to measure the amount of polychlorinated biphenyls (PCBs) in the air, dust, and soil, and to determine the most effective ways to reduce potential exposures.

As way of background, beginning in 1950, building materials containing PCBs were legally used to construct and renovate buildings, including schools, across the U.S. and in New York City. The EPA banned the use of PCBs in the late 1970s. However, buildings constructed during this time period may still contain materials that were made with PCBs. This pilot study focuses on a specific building material: PCB containing caulk. Both EPA and the City want to learn more about whether this PCB caulk can lead to high levels of PCBs in the indoor air, dust, and soil and, if so, how to prevent that from occurring.

The New York City School Construction Authority (SCA) with the New York City Department of Education (DOE) implemented the pilot study in three (3) of the schools this summer: PS 309K/Excellence Charter, PS 199M, and PS 178X. As part of the work plan, the SCA conducted an initial inspection and baseline sampling of PCBs in air, dust, and soil. The remediations specified in the pilot study for managing PCB Caulk in each of the schools were performed in the pilot study classrooms and other areas. For a detailed description of the remedial work plans in these schools, see RIWP Fact Sheet Final 6/16/2010 on this website.

Air Tests

At least four (4) rounds of air tests were performed at each school. A representative number of classrooms and other school areas, such as gyms, cafeterias and hallways, were tested in each school. A summary of the results is shown in the chart below and full laboratory results are provided, as they become available, in the link at the bottom of the chart. The test results represent the PCB air levels in the areas tested on the date and under the conditions reported in the chart.

The air tests performed at the schools included the following:

- Pre-remediation air tests. For these tests, all the windows were closed. The results of these tests showed elevated PCBs in air in all three (3) schools.
- Post-remediation air tests. Using the same conditions in the rooms, air tests were repeated after the remediation work was completed and results generally showed a decrease in air levels, but some levels were still above the EPA guidance.
- Post-ventilation air tests. The schools were completely ventilated and additional rounds of air tests were taken with windows open. Results of these air tests showed some additional improvement in air levels.
- Post-lighting fixture removal air tests. After the first round of air tests showed elevated PCBs in air in spaces without PCB-containing caulk, SCA further investigated PCB sources and identified some evidence of leaking PCB-containing ballasts in the lighting fixtures. Lighting fixtures were replaced in the schools. The results of air tests conducted after the removal of the old fluorescent fixtures were all below (i.e., better than) EPA guidance at 309K and in most areas at 178X and 199M.

- Post-encapsulation air tests at 199M. Air sampling conducted, following the removal of the old fluorescent light fixtures, showed 11 of the 59 areas in 199M as having concentrations above guidance levels. The remaining PCB caulk in the building was then encapsulated with a new bead of caulk and additional air tests taken. Air sampling results did not yet indicate an improvement in those 11 areas following the encapsulation of PCB caulk.
- October 11 and 17, 2010, air tests at 199M. These samples were collected in the same locations as the post-encapsulation air samples collected on September 3, 2010. The air sample taken in the gymnasium on October 11, 2010, was voided due to breakage during laboratory sample handling. The air sample in the gymnasium was re-collected on October 17, 2010. The results of the air tests conducted on October 11, 2010, within the kindergarten areas, showed a significant decrease and were below 300 nanograms/cubic meter of air, although still exceeded the EPA guidance for kindergarten classrooms. The air sample collected on October 17, 2010, within the gymnasium was below the EPA guidance.
- Post-supplemental cleaning and HVAC repair air tests at 178X. Air sampling conducted after the removal of some older fluorescent light fixtures and ballasts showed five (5) areas in 178X having concentrations above EPA guidance. These areas were thoroughly cleaned and the five (5) areas tested again. Results from this round of air tests revealed that three (3) areas remained above EPA guidance. The SCA then inspected the building's HVAC system and found that the fresh air intake and return spill dampers for these areas were not functioning despite readings from the system's computer indicating that they were operating properly. The appropriate repairs were made to restore ventilation after which the air in the three (3) areas was sampled and found to be below EPA guidance levels.

The chart below contains air sample results from the rounds of testing conducted so far. However, only the results from the baseline round are based upon final, confirmed data. The results from post-remediation and later air sampling are preliminary and final data will be posted when the data is validated. It is important to review all of the test results from each school over time. In almost all cases, conditions in the schools have improved since remediation has been completed, schools ventilated, and old fluorescent lighting fixtures removed. There are still kindergarten areas that exceed guidance levels in PS 199M and the SCA will continue to take further actions to reduce these levels. The chart will be updated as soon as final, confirmed data for the air tests are available.

As explained above, the SCA has or will replace all of the fluorescent light fixtures in the three (3) pilot schools. Old fluorescent lighting with PCB-containing ballasts may become a source of PCBs in the environment if not replaced before leaks occur. Additional air tests have been conducted following completion of this work and the results posted in the chart.

EPA Guidance Levels

EPA has set guidance level for PCBs in air of 300 nanograms/cubic meter of air for elementary schools. Air levels in PreK/K areas are targeted at 100 nanograms/cubic meter of air and faculty/staff areas at 450 nanograms/cubic meter of air. These are very low levels. A nanogram is one billionth of a gram. EPA guidance levels are intended to be protective of long term exposure with an adequate margin of safety. Short term exposures above the guidance level would not indicate the likelihood of an adverse effect. If PCBs are found above the EPA guidance level, the foremost priority will be to reduce exposures as quickly as possible.

Dust Tests

The EPA guidance level for dust is 10 micrograms per 100 square centimeters. The SCA took 74 baseline pre-remediation composite dust wipe samples in the three (3) schools, all of which were below EPA guidance levels. Following remediation activities, composite dust samples were collected in the same 74 locations. All composite wipe samples were found to be below the EPA guidance level, except for one sample in the gymnasium of PS 199M (199-GYM-WL-POST-2-A, B) that was elevated. Because this lone test result was not consistent with all other pre and post-remedial results that were obtained in the building, two additional samples were taken at the same location. Six (6) additional dust wipe samples were also taken approximately one (1) foot from this location. The results of all of these eight (8) additional samples were all below the EPA guidance levels.

Soil Tests

The EPA guidance level for PCBs in the soil is 1 part per million (ppm). The results of the soil tests at the three (3) schools ranged from less than 0.5 to 32.7 ppm with one (1) isolated sample at PS 178 at 211 ppm. The SCA is currently developing remedial work plans to remove impacted soils that will be implemented upon approval by the appropriate regulatory authorities. Pending remediation, the SCA has isolated these areas with a geotextile fabric covering material as approved by EPA.

General information about PCBs and their known health effects can be found at www.nyc.gov/html/doh and www.epa.gov.

Preliminary Air Sample Data - July and August 2010									
PS 309K									
Brooklyn, NY									
PS 309K	Event	# Areas Sampled	Sample Collection Date	Daily Average Temp (°F)	Sampling Conditions	Mean (ng/m3)	Minimum (ng/m3)	Maximum (ng/m3)	% Areas Under Guidance Criteria
Classrooms	Pre-Remediation Round 1	6	7/13/10, 7/14/10	77.0 85.7	Windows and doors closed, window A/C off, Exhaust Ventilation on	1406	838	2950	0
	Pre-Remediation Round 2	6	07/24/10	83.2	Windows and doors closed, window A/C off, Exhaust Ventilation on	1612	350	4957	0
	Post-Remediation	6	08/01/10	82.4	Windows and doors closed, window A/C off, Exhaust Ventilation on	819	296	1815	0
	Post-Ventilation	6	08/04/10	85.0	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	146	55	216	100
	Post-Fixture Removal	38	08/26/10	73.8	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	50	45	81	100
Common Spaces	Pre-Remediation Round 1	8	7/13/10, 7/14/10	77.0 85.7	Windows and doors closed, window A/C off, Exhaust Ventilation on	341	236	511	62.5
Gyms, Halls, Stairways, Libraries, Art Rooms, Cafeterias, Offices, etc.	Pre-Remediation Round 2	5	07/24/10	83.2	Windows and doors closed, window A/C off, Exhaust Ventilation on	758	396	1264	0
	Post-Remediation	8	08/01/10	82.4	Windows and doors closed, window A/C off, Exhaust Ventilation on	370	165	1021	62.5
	Post-Ventilation	8	08/04/10	85.0	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	176	53	230	100
	Post-Fixture Removal	30	08/26/10	73.8	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	86	43	333	100

- Notes:
- EPA Guidance values for the schools are 300 ng/m3 for children 6-12 years old, 100 ng/m3 for children 3-6 years old in kindergarten and pre-kindergarten classrooms, and 450 ng/m3 for faculty/school staff areas ages 19 and older.
 - Ambient air samples collected in each round indicated that PCBs were not detected (reporting limit approximately 50 ng/m3).
 - ng/m3 - nanograms per cubic meter.
 - The air samples were collected following US EPA Method TO-10A.
 - The data presented have not been validated and are subject to change.

Preliminary Air Sample Data - July, August, September , and October 2010

PS 199M

New York, NY

	Event	# Areas Sampled	Sample Collection Date	Daily Average Temp (°F)	Sampling Conditions	Mean (ng/m3)	Minimum (ng/m3)	Maximum (ng/m3)	% Areas Under Guidance Criteria
Classrooms	Pre-Remediation	8	07/17/10	83.1	Windows and doors closed, window A/C off, Exhaust Ventilation on	844	414	1460	0
	Post-Remediation	8	08/07/10	80.4	Windows and doors closed, window A/C off, Exhaust Ventilation on	549	321	729	0
	Post-Ventilation	8	08/11/10	82.3	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	456	296	631	12.5
	Post-Light Fixture Replacement	43	08/27/10	75.9	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	230	48	347	74
	Post-Encapsulation	10	09/03/10	77.4	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	414	354	520	0
	October 11 and 17, 2010 Sampling	10	10/11/10	69.5	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	195	162	231	20
Common Spaces	Pre-Remediation	4	07/17/10	83.1	Windows and doors closed, window A/C off, Exhaust Ventilation on	832	551	1362	0
	Post-Remediation	4	08/07/10	80.4	Windows and doors closed, window A/C off, Exhaust Ventilation on	496	245	934	25
	Post-Ventilation	4	08/11/10	82.3	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	403	275	542	25
	Post-Light Fixture Replacement	16	08/27/10	75.9	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	203	51	362	94
	Post-Encapsulation	1	09/03/10	77.4	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	599	599	599	0
	October 11 and 17, 2010 Sampling	1	10/17/10	71.4	Doors closed, window A/C off, Windows open, Exhaust Ventilation on	222	222	222	100

Notes:

1. EPA Guidance values for the schools are 300 ng/m3 for children 6-12 years old, 100 ng/m3 for children 3-6 years old in kindergarten and pre-kindergarten classrooms, and 450 ng/m3 for faculty/school staff areas ages 19 and older.
2. Ambient air samples collected in each round indicated that PCBs were not detected (reporting limit approximately 50 ng/m3).
3. ng/m3 - nanograms per cubic meter.
4. The air samples were collected following US EPA Method TO-10A.
5. The data presented have not been validated and are subject to change.

Preliminary Air Sample Data - July and August 2010

PS 178X

Bronx, NY

	Event	# Areas Sampled	Sample Collection Date	Daily Average Temp (°F)	Sampling Conditions	Mean (ng/m3)	Minimum (ng/m3)	Maximum (ng/m3)	% Areas Under Guidance Criteria
Classrooms (Pre-K and K only)	Pre-Remediation	4	07/15/10	74	Windows and doors closed, HVAC on	118	58	195	50
	Post-Remediation	4	07/28/10	79.6	Windows and doors closed, HVAC on	205	146	328	0
Classrooms (1st grade and higher)	Pre-Remediation	5	07/15/10	74	Windows and doors closed, HVAC on	78	49	129	100
	Post-Remediation	5	07/28/10	79.6	Windows and doors closed, HVAC on	148	60	285	100
Common Spaces Lobby and Cafeteria	Pre-Remediation	2	07/15/10	74	Windows and doors closed, HVAC on	NA	48	49	100
	Post-Remediation	2	07/28/10	79.6	Windows and doors closed, HVAC on	NA	50	69	100

- EPA Guidance values for the schools are 300 ng/m3 for children 6-12 years old and 100 ng/m3 for children 3-6 years old in kindergarten and pre-kindergarten classrooms (<http://www.epa.gov/pbcsincaulk/maxconcentrations.pdf>)
- Ambient air samples collected in each round indicated that PCBs were not detected (reporting limit approximately 50 ng/m3).
- ng/m3 - nanograms per cubic meter.
- The air samples were collected following US EPA Method TO-10A.
- TBD - To be determined.
- The data presented have not been validated and are subject to change.
- NA - Not applicable
- All kindergarten and pre-kindergarten classrooms were ventilated and re-tested, since they were the only areas with air values elevated above guidance values (See next chart).

Preliminary Air Sample Data - August and September 2010

PS 178X

Bronx, NY

	Event	# Areas Sampled	Sample Collection Date	Daily Average Temp (°F)	Sampling Conditions	Mean (ng/m3)	Minimum (ng/m3)	Maximum (ng/m3)	% Areas Under Guidance Criteria
Kindergarten and Pre-kindergarten Classrooms Only	Post-Ventilation	15	08/09/10	75.1	Windows and doors closed, HVAC on	148	48	382	33
	Post-Fixture Removal	16	08/25/10	70.3	Windows and doors closed, HVAC on	85	48	227	69
	Post-Supplemental Cleaning	5	08/31/10	72.8	Windows and doors closed, HVAC on	196	53	429	40
	Post-HVAC Repair	3	09/05/10	66.8	Windows and doors closed, HVAC on	48	47	48	100

Notes:

- EPA Guidance values for the schools are 300 ng/m3 for children 6-12 years old and 100 ng/m3 for children 3-6 years old in kindergarten and pre-kindergarten classrooms
- Ambient air samples collected in each round indicated that PCBs were not detected (reporting limit approximately 50 ng/m3).
- ng/m3 - nanograms per cubic meter.
- The air samples were collected following US EPA Method TO-10A.
- The data presented have not been validated and are subject to change.

Preliminary Wipe Sample Data - July, August 2010

PS309K

Brooklyn, NY

	Event	# Composite Samples	Sample Collection Date	Mean (ug/100cm ²)	Minimum (ug/100cm ²)	Maximum (ug/100cm ²)	% Areas Under Guidance Criteria
Classrooms	Pre-Remediation	12	07/17/10	0.245	< 0.100	0.598	100
	Post-Remediation	12	08/08/10	0.143	< 0.100	0.374	100
Common Spaces	Pre-Remediation	16	07/17/10	0.250	< 0.100	0.864	100
	Post-Remediation	16	08/08/10	0.289	< 0.100	0.947	100

- EPA guidance values are based upon High Occupancy wipe sample criteria of 10 micrograms per 100 cm² (40 CFR 761.3, 761.123 and 761.30).
- ug/100cm² - micrograms per 100 square centimeters.
- The wipe samples were collected in accordance with EPA 40 CFR 761.3, 761.123 and 761.30.
- The data presented have not been validated and are subject to change.

Preliminary Wipe Sample Data - July, August 2010

PS199M

New York, NY

	Event	# Composite Samples	Sample Collection Date	Mean (ug/100cm²)	Minimum (ug/100cm²)	Maximum (ug/100cm²)	% Areas Under Guidance Criteria
Classrooms	Pre-Remediation	16	07/17/10	0.230	< 0.100	0.735	100
	Post-Remediation	16	08/08/10	0.181	< 0.100	0.419	100
Common Spaces ^(5,6)	Pre-Remediation	8	07/17/10	0.336	< 0.100	0.748	100
	Post-Remediation	8	08/08/10	12.42	< 0.100	97.60	87.5
Gym - 2nd round ^(5,6)	Post-Remediation	8	08/19/10	0.145	< 0.100	0.22	100

1. EPA guidance values are based upon High Occupancy wipe sample criteria of 10 micrograms per 100 cm² (40 CFR 761.3, 761.123 and 761.30).
2. ug/100cm² - micrograms per 100 square centimeters.
3. The wipe samples were collected in accordance with EPA 40 CFR 761.3, 761.123 and 761.30.
4. The data presented have not been validated and are subject to change.
5. Of all wipe samples collected, only one composite sample (of two locations) was greater than 1 ug/100 cm². Since the result was so far outside the other values of the data set, a second round of sampling was done in which a total of eight individual wipe samples were collected as follows: Two individual wipe samples were collected at the identical locations used to collect the only wipe composite sample with a value greater than 1 ug/100cm², and six additional individual wipe samples were also collected approximately one foot from the two individual wipe samples. The analytic results for the eight samples, summarized as "Gym - 2nd round", were all significantly below guidance criteria. Therefore, the 97.6 ug/100 cm² result is considered anomalous.
6. Gym - 2nd round samples are individual samples (not composited)

Preliminary Wipe Sample Data - July 2010

PS 178X

Bronx, NY

	Event	# Composite Samples	Sample Collection Date	Mean (ug/100cm²)	Minimum (ug/100cm²)	Maximum (ug/100cm²)	% Areas Under Guidance Criteria
Classrooms - Pre-K and K only	Pre-Remediation	12	7/15/and 7/16/2010	0.188	< 0.100	0.716	100
	Post-Remediation	12	07/29/10	0.139	< 0.100	0.279	100
Classrooms - First Grade and Higher	Pre-Remediation	6	7/15/and 7/16/2010	0.124	< 0.100	0.177	100
	Post-Remediation	6	07/29/10	0.180	< 0.100	0.538	100
Common Spaces - Lobby and Cafeteria	Pre-Remediation	4	07/15/10	0.104	< 0.100	0.115	100
	Post-Remediation	4	07/29/10	0.100	< 0.100	0.100	100

1. EPA guidance values are based upon High Occupancy wipe sample criteria of 10 micrograms per 100 cm² (40 CFR 761.3, 761.123 and 761.30).
2. ug/100cm² - micrograms per 100 square centimeters.
3. The wipe samples were collected in accordance with EPA 40 CFR 761.3, 761.123 and 761.30.
4. The data presented have not been validated and are subject to change.

For TRC's Pre-Remediation Baseline Air Sampling Summary Report click [here](#)

For TRC's Pre- and Post-Remedial Wipe Sample Results and Post-Remedial and Post-Ventilation Air Sampling Summary Report click [here](#)

For TRC's Pre-Remedial Soil Sampling Summary Report click [here](#)

For TRC's Post-Light Fixture Replacement, -Supplemental Cleaning, -Encapsulation, and -HVAC Repair Air Sampling Results Summary Report click [here](#)

For TRC's Bulk Building Material Sampling Results Summary Report click [here](#)

For TRC's October 11 and 17, 2010 PCB Air Sampling Results Summary Report click [here](#)

For TRC's November 26, 2010 PCB Air Sampling Results Summary Report click [here](#)

For TRC's Caulk, Ballast and Starter Sample Results Summary Report click [here](#)

For TRC's February 22 and March 5, 2011 PCB Air Sampling Results Summary Report click [here](#)

For TRC's February 25, 2011 PCB Air Sampling Results Summary Report click [here](#)

For TRC's April 20 and May 14, 2011 PCB Air Sampling Results Summary Report click [here](#)