

Summary of the Analytical Results for the Chemicals of Potential Concern

USEPA's review of the analytical data for samples collected from 125 Cedar Street indicate that the areas sampled meet the numeric criteria established in the draft "World Trade Center Indoor Air Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks" report (i.e., COPC document). The COPC document was created by a committee with representation from federal, state, and city government and was designed to establish numeric criteria to be used in addressing potential contamination from dust and combustion by-products associated with the World Trade Center collapse and fire. This document is currently undergoing peer-review. The data which was evaluated consisted of pre-cleaning and post-cleaning samples for six chemicals, asbestos, polycyclic aromatic hydrocarbons (PAHs), dioxin, lead, fibrous glass, mercury and silica. For some chemicals all of the pre-cleaning samples were below the established numeric criteria, such as dioxin. In addition, some of the post-cleaning samples exceeded the numeric criteria for several chemicals, such as asbestos. These areas (i.e., an apartment or common space) required additional cleaning and subsequent re-testing. An area was not considered to be cleaned until all the numeric criteria for each chemical was met. All of the areas tested met the numeric criteria for each chemical prior to performing the walk through inspections that occurred on November 07 and 08, 2002. Below is a summary of the analytical results for each chemical.

Asbestos – We reviewed approximately 143 asbestos analytical results that were analyzed using Transmission Electron Microscopy (TEM) performed using EPA 40 CFR Part 763 Final Rule (AHERA), which had a detection limit of either 0.0009 f/cc or 0.0008 f/cc for fibers greater than or equal to 5 μ . Based on these analytical results, eight samples in six units/spaces exceeded our clearance criteria of 0.0009 f/cc. These units/spaces (5S, 5N, 3N, 9N, staircase between 7 & 8, and the 6th floor hallway) were recleaned and then retested using the analytical method identified above. Several additional spaces (8S, 7N, 7S, 7th floor laundry room) were also recleaned and retested because asbestos was detected and the initial detection limit was set very close to the clearance criteria. It should be noted that these areas met the numeric criteria, however to provide additional confidence in the data, it was recommended that the 4 spaces be recleaned and retested. The detection limit was lowered to 0.0004 f/cc for subsequent testing. All of the 43 samples collected during the retesting met the numeric criteria after the second cleaning. An additional set of data, 30 samples, was received for four units (2N, 9S, 8N, and 3S). This data indicated that two units met the numeric criteria (9S and 3S) and the remaining two exceeded the numeric criteria. These two units were recleaned and retested. Apartment 8N met the numeric criteria after the second cleaning (5 Samples), however apartment 2N (5 Samples) did not, thus it was recleaned and retested. After the third cleaning, apartment 2N (5 Samples) met the numeric criteria. Thus, for asbestos, the data we reviewed indicates that asbestos is not a hazard at 125 Cedar Street.

(Note: The original 143 asbestos samples were analyzed a second time using a slightly different method than EPA 40 CFR Part 763 Final Rule (AHERA). Although the results of the second analysis indicated that only one sample exceeded the numeric criteria, this data was not used because it is not a standard practice to reanalyze a filter and use the second set of data. Thus, the original data that showed additional exceedances of the numeric criteria was used which resulted in additional units being recleaned and retested.)

PAHs – The analytical data for polycyclic aromatic hydrocarbons (PAHs) that was reviewed consisted only of pre-cleaning samples. Post-cleaning samples were also collected, however the analytical results are not available at this date. When the analysis is completed for the post-cleaning samples, USEPA will review the data. We reviewed data for 66 wipe samples which were analyzed for a suite of 16 polycyclic aromatic hydrocarbons (PAHs). All of the samples had reported results of non-detect which indicates that PAHs could not be detected above the limit of detection of 5 μ g. Evaluation of PAH data is accomplished by using a method called toxic equivalency factors (TEFs). The TEF methodology uses the data from seven of the individual PAHs, which are summed after being adjusted to provide an estimate of the

relative potency compared to benzo[a]pyrene, which is the most toxic of the PAHs. The TEF procedure generally uses $\frac{1}{2}$ of the detection limit in the calculations when the reported value is below the detection limit. As the results from 125 Cedar Street were all non-detect, the TEF calculations yield a value of $580 \mu\text{g}/\text{m}^2$ when calculated using $\frac{1}{2}$ the detection limit. The PAH data set would have been more robust had the detection limit been set at $2.5 \mu\text{g}$. If a detection limit of $2.5 \mu\text{g}$ would have been used, the TEF calculations would have yielded a value of $290 \mu\text{g}/\text{m}^2$, assuming that the samples remained as non-detect. This distinction is important because the numeric criteria presented in the COPC document is $300 \mu\text{g}/\text{m}^2$. In an attempt to make an informed evaluation of the PAH data from 125 Cedar Street, a comparison was made to PAH data which USEPA collected from 110 Liberty Street. The PAH data from 110 Liberty indicated that the concentration of the seven PAHs used in the TEF calculations were primarily non-detect at a detection limit of $2.5 \mu\text{g}$. This indicates that even if a lower detection limit was used at 125 Cedar Street, the results would likely indicate non-detect for the PAHs, similar to what was observed at 110 Liberty Street. In addition, some of the PAHs that are not included in the calculation of TEFs (i.e., non-carcinogenic PAHs) were the most frequently detected PAHs at 110 Liberty and were detected at concentrations above $5 \mu\text{g}$. The non-carcinogenic PAHs are not included in the TEF calculations because they are less toxic than the carcinogenic PAHs, therefore identification of a non-carcinogenic PAH would not increase the TEF value. Thus, it would be expected that some of the non-carcinogenic PAHs would have been detected above $5 \mu\text{g}$ if they were present at 125 Cedar Street. The combination of these two factors provides evidence that the data collected at 125 Cedar Street can be accepted even though the detection limit was not as low as it could have been. In addition, the pre-cleaning PAH results are similar to the results observed at 110 Liberty Street. The post-cleaning PAH samples at 110 Liberty Street were all below the numeric criteria as well. Therefore, even though the post-cleaning samples from 125 Cedar Street were not evaluated, it is expected that the samples will all be below the numeric criteria based on the pre-cleaning samples being below the criteria and the similarity to what was observed at 110 Liberty Street. Thus, for PAHs, the data we reviewed indicates that PAHs are not a hazard at 125 Cedar Street.

Dioxin – The analytical data for dioxin that was reviewed consisted only of pre-cleaning samples. Post-cleaning samples were also collected, however the analytical results are not available at this date. When the analysis is completed for the post-cleaning samples, USEPA will review the data. We reviewed 66 wipe results which were analyzed for dioxin. Evaluation of dioxin results is similar to that reported above for PAHs in that the results for individual congener groups are adjusted and summed to provide toxic equivalency for 2,3,7,8-TCDD, the most toxic dioxin congener, using a process called toxic equivalents (TEQs). Similar to the PAH data the TEQ calculations use $\frac{1}{2}$ of the detection limit in the TEQ calculations. The detection limit was acceptable and all of the samples met the numeric criteria of $4 \text{ ng}/\text{m}^2$. The pre-cleaning dioxin results are similar to the results observed at 110 Liberty Street. The post-cleaning dioxin samples at 110 Liberty Street were all below the numeric criteria as well. Therefore, even though the post-cleaning samples from 125 Cedar Street were not evaluated, it is expected that the samples will all be below the numeric criteria based on the pre-cleaning samples being below the criteria and the similarity to what was observed at 110 Liberty Street. Thus, for dioxin, the data we reviewed indicates that dioxin is not a hazard at 125 Cedar Street.

Lead – We reviewed approximately 72 wipe sample results which were analyzed for lead. There were 10 samples that were above the numeric criteria, of $25 \mu\text{g}/\text{ft}^2$, listed in the COPC document. The apartments which exceeded the numeric criteria were 12N, 11N, 10S, 10N, 9N, 8S, 8N, 3S, and 2S. These apartments were recleaned and retested (14 samples). Six units met the numeric criteria, however three units (12N, 11N, and 10S) did not meet the numeric criteria. These three units were recleaned and retested. Apartment 12N and 10S met the numeric criteria after the second cleaning. Apartment 11N did not meet the numeric criteria and required a third cleaning. The results for apartment 11N after the third cleaning were below the numeric criteria. Thus, for lead, the data we reviewed indicates that lead is not a hazard at 125 Cedar Street.

Fibrous glass – We reviewed approximately 120 PCM results reported as fibrous glass analysis. The highest detected concentration was 0.009 f/cc, which is below the numeric criteria of 0.01 f/cc in the COPC document. Thus, for fibrous glass, the data we reviewed indicates that fibrous glass is not a hazard at 125 Cedar Street.

Mercury – We reviewed 66 wipe results which were analyzed for mercury. Seventeen samples were below the detection limit of 0.000478 $\mu\text{g}/\text{m}^2$ and the highest detected concentration was 0.0164 $\mu\text{g}/\text{m}^2$. The COPC document does not establish a numeric criteria for mercury, however since USEPA is collecting 250 wipe samples for mercury as part of residential cleanup program a numeric criteria is currently being developed. The draft value, which is subject to revision based upon further evaluation of exposure parameters, is currently 94 $\mu\text{g}/\text{m}^2$. Comparison of the mercury concentrations detected to the draft numeric criteria of 94 $\mu\text{g}/\text{m}^2$ indicates that mercury is three orders of magnitude below the draft numeric criteria. Thus, for mercury, the data we reviewed indicates that mercury is not a hazard at 125 Cedar Street.

Silica – We reviewed the data for 19 air samples which were analyzed for silica (i.e., total quartz). All of the samples were below the detection limit of 10 μg . The numeric criterion that USEPA has proposed in the COPC document is 1 $\mu\text{g}/\text{m}^3$. Although the COPC document has chosen the value of 1 $\mu\text{g}/\text{m}^3$, the available methodology for collecting indoor air samples for silica cannot achieve a value this low, therefore a result that is below the detection limit is considered to be protective of public health. This is the same approach we are using at 110 Liberty Street, where the detection limit was 4 μg . Thus, for silica, the data we reviewed indicates that silica is not a hazard at 125 Cedar Street.