OLMSTED ENVIRONMENTAL SERVICES, INC
1992 Route 9, Garrison NY 10524
phone 845 424 4077 • fax 845 424 3482 • email Olmsted.mac@mac.com

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Date: March 25th, 2026

To: Alexandrea Ravenelle
333 East 14th Street
Apartment 6NA
New York, NY

aravenelle@gmail.com

Prepared by: Edward Olmsted, CIH, CSP

Project: **Follow-up Indoor Environmental Testing**
Odor and Dust Infiltration – Apartment 6NA
333 East 14th Street Apartment 6NA, New York, NY

Survey Dates **March 16th to 23rd, 2026**

INTRODUCTION

Ed Olmsted conducted performed a follow-up indoor air quality survey in apartment 6NA at 333 East 14th Street in Manhattan, NY. Prior testing revealed episodes of poor air quality because of air moving from the adjacent apartment 6B into 6NA. The building management installed dampers and reduced exhaust airflow in 6NA prevent the air quality episodes. Despite the reduced exhaust airflow there, cooking odors and rapid airflow through the shared wall could still be observed and in fact levels increased. This survey was done to assess the airflow and measure levels of PM2.5 particulate over the course of 7 days. The survey included the following:

1. Visual inspection of the apartment; and
2. Texting air velocity using a TSI thermal anemometer; and
3. Using a ventilation smoke tube to assess airflow direction; and
4. Datalogging levels of PM2.5 particulate over 7 days.

BACKGROUND

There have been cooking odor episodes in apartment 6NA for an extended period. Testing in January revealed a pattern of increased PM2.5 particulate levels entering 6NA through the shared wall between 6B and 6NA. PM2.5 particles are produced by cooking and combustion. Most house dust is large than 2.5 microns. Particles above 2.5 microns are not measured by the equipment.

The NYC Department of Buildings investigated the complaint and ran airflow tests in the apartment DOB confirmed that air flows from 6B into 6NA through the primary bedroom wall. The DOB required the building management to reduce the exhaust flowrate from the four exhausts and adjust air intake. This was anticipated to reduce or eliminate the movement of air from 6B to 6NA. The building reduced exhaust from the four grills in 6NA by installing dampers to reduce the airflow rate. It was reported that no other work was done to investigate air pressure and air flow. Despite the adjustments to the four exhausts, air still flowed rapidly through wall from 6B to 6NA along the shared wall in the primary bedroom. This survey was done to measure and record PM2.5 levels in the master bedroom over the course of seven days and to measure exhaust volume airflow and direction.

The apartment has sheetrock walls and ceilings, concrete slab finished with hardwood, and operable windows. There are radiators in each room under the window that provide heating and through the wall direct cooled air conditioner units in the primary bedroom and living room.

METHODS

Apartment 6NA was visually inspected and levels of PM2.5 particulate were measured over 7 days. The following summarizes the sample methods and interpretation of sample results.

Airborne Particulate Datalogging

Airborne dust levels were measured using a TSI Dust Trak II monitor and measured as PM 2.5 (<2.5 microns), which are fine particulate associated with combustion smoke. The TSI Dust trak II instrument was calibrated by the manufacturer in July 2025. The EPA threshold guide for PM2.5 outdoors is 0.035 milligrams per cubic meter averaged over 24 hours and 9 milligrams per cubic meter annual average. The World Health Organization recommends 0.015 mg/m3 as a 24-hour limit. The level of PM2.5 outdoors is used by EPA to calculate the air quality index. Levels of PM2.5 over 0.035 mg/m3 are rated by EPA as unhealthy for sensitive groups.

Air Velocity

Air velocity was measured with a TSI Velocicalc thermal anemometer calibrated by the manufacturer in February 2026. This meter measures air velocity in feet per minute (fpm) and is sensitive down to 10 fpm. The area of the vent opening was measured in square feet and the velocity in FPM to estimate the volume flowrate in cubic feet per minute.

FINDINGS

1. The apartment was vacant through the week. There were no activities in apartment 6NA that would create PM2.5 particulate.
2. A food odor was perceptible in the primary bedroom of 6NA at 11 am on Monday, March 16th. This coincided with an elevated PM2.5 reading of 0.11 mg/m3.

3. There is still strong airflow through the electrical outlet on the shared wall between 6B and 6NA primary bedroom. The air flows from 6B into 6A. The velocity at the outlet was measured at 770 fpm.
4. Air flowed through the electrical outlet in the living room through the wall shared with the 6B apartment. Apartment 6NA is under negative pressure to 6B and positive pressure to the apartment 6M. The air is flowing through apartment 6NA from 6B to 6N.
5. The attached diagram depicts the directional airflow through 6NA.
6. All four exhausts in the apartment were drawing air. Air flow at the four exhaust grills was estimated by measuring the grill opening size in square feet and the air velocity in feet per minute. The calculated airflow in cubic feet per minute (CFM) are as follows:
    a. Kitchen 20 CFM
    b. Hall bathroom 12 CFM
    c. Master Bathroom toilet 8 CFM
    d. Master bathroom shower 15 CFM

    These measurements are estimates because the impact of the grill on velocity measurements creates turbulence that impacts the measurement. A flow hood would provide a more accurate measurement.

7. With windows open the apartment develops high positive pressure to the common hallway. This makes it difficult to open the entry door.
8. Table 1 provides a summary of the PM2.5 measurement over 7 days. Levels of PM2.5 averaged 0.025 milligrams per cubic meter. This is higher than the measured average in January of 0.018 mg/m3 and is above the EPA level of 0.035 mg/m3 averaged over 24 hours.
9. Figure 1 provides a scan of the data logged levels over the seven days. There is a pattern consistent with the study completed in January.
    a. The highest measured level was 0.44 mg/m3. This level is over 12 times the EPA standard for the 24-hour standard of 0.035 mg/m3. It is also well above the outdoor level of PM2.5 published by DEP for the 14th street area.
    b. Levels are low throughout the night and early morning consistent with normal background.
    c. Levels increase late morning or early afternoon and remain higher until around 8 pm. This pattern is repeated most days.

CONCLUSIONS

The levels of PM2.5 inside apartment are above the WHO guideline, and above the outdoor background level reported by DEP for NYC 14th street area. The reduction of air flow in the

exhaust has not mitigated the food odors and air quality problems. Occupants of 6NA report that there are food cooking odors in 6NA almost every day. The tests a recurring timing pattern of PM2.5 elevations consistent with cooking lunch and dinner. The findings of this survey indicate the following:

1. The adjustments to the exhaust ventilation have not mitigated the air quality problem. Air still flows strongly from 6B through the shared wall to 6NA. The levels of PM2.5 increased during this survey compared to the January 2026 tests.
2. The are still food odor and air quality problems in 6NA that follow a pattern each day and are not a result of any activities in 6NA. The pattern is present when the apartment is empty.
3. The apartment 6NA levels exceed the reported outdoor range. This condition Is unhealthy.
4. There is a strong negative pressure in apartment 6NA and the 6th floor. This pulls air through 6NA and from 6B and through the walls from outside the building. This negative pressure is excessive.

The entry of cooking smoke produces air quality problems in 6NA and is a nuisance. Cooking odors are a combination of particulate matter, gases and vapors. Breathing these air contaminants over an extended time can cause respiratory irritation and exacerbate asthma. According to the World Health Organization *"Particulate matter and other pollutants in household air pollution inflame the airways and lungs, impair immune response and reduce the oxygen-carrying capacity of the blood."*[1] Studies have shown that repeated exposure to cooking oil fume is associated with an increased risk of lung cancer.[2,3,4,5] Furthermore, the uncontrolled airflow in the building can impact safety should an emergency occur. Heat and smoke from a fire can move quickly through fire separations in unpredictable ways causing egress paths to fill with smoke.

The current amount of negative pressure in 6NA pulls outside air into the apartment in an uncontrolled manner. This can allow hot humid air to enter in the summer causing condensation on surfaces. The air will generally pull though AC unit sleeves penetrating the wall bring hot humid air in contact with a cold condensing surface. Most air-conditioned buildings are designed to have positive pressure to prevent the outside air infiltration.

[1] World Health Organization (WHO); Household Air Pollution; 16 October 2024

[2] Yingbo Xue et al; Association Between cooking oil fume exposure among Chinese non-smoking women; a meta analysis; OncoTargets and Therapy; 2016; p 2987

[3] Pan C-H, Chan C-C, Wu K-Y, Effects on Chinese restaurant workers of exposure to cooking oil fumes: a cautionary note on urinary 8-hydroxy-2′ -deoxyguanosine, Cancer Epidemiol. Biomarkers Prev 17(12) (2008) 3351–3357. [DOI] [PubMed]

[4] Ke Y, Cheng J, Zhang Z, Zhang R, Zhang Z, Shuai Z, Wu T, Increased levels of oxidative DNA damage attributable to cooking-oil fumes exposure among cooks, Inhalation Toxicol. 21(8) (2009) 682–687.

[5] Neghab M, Delikhoon M, Baghani AN, Hassanzadeh J, Exposure to cooking fumes and acute reversible decrement in lung functional capacity, Int. J. Occup. Environ. Med 8(4) (2017) 207–216.

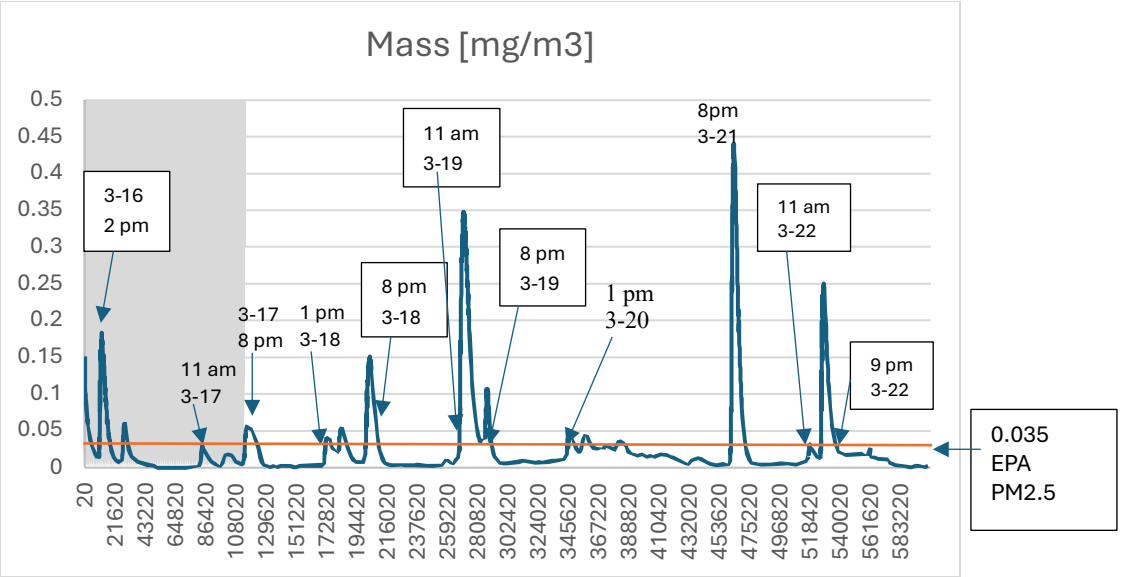
For the many reasons indicated above, an engineering study should be done to determine the cause of the negative pressure in the building that pulls air through 6B, 6NA into the 6M apartment and common hallway. The air may continue to travel through 6M into another area. This should be further investigated.

Table 1

333 East 14 6N March 23, 2026

Instrument Name	DustTrak II		
Calibration Date	07/28/2025		
Test Name	333 E 14 6N		
Test Start Time	11:05:17 AM		
Test Start Date	03/16/2026		
Test Length [D:H:M]	7:0:0		
Test Interval [M:S]	0:20		
Mass Average [mg/m3]	0.025		
Mass Minimum [mg/m3]	0		
Mass Maximum [mg/m3]	0.44		
Mass TWA [mg/m3]	0.049		
Number of Samples	30,240		
EPA 24-hr average	0.035		
WHO guideline	0.015		
NYC 14th street winter (NYCDEP)	0.0076		

Figure 1


Mass [mg/m3]
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0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
20
21620
43220
64820
86420
108020
129620
151220
172820
194420
216020
237620
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11 am
3-17
3-17
8 pm
1 pm
3-18
8 pm
3-18
11 am
3-19
8 pm
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3-20
8pm
3-21
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3-22
9 pm
3-22
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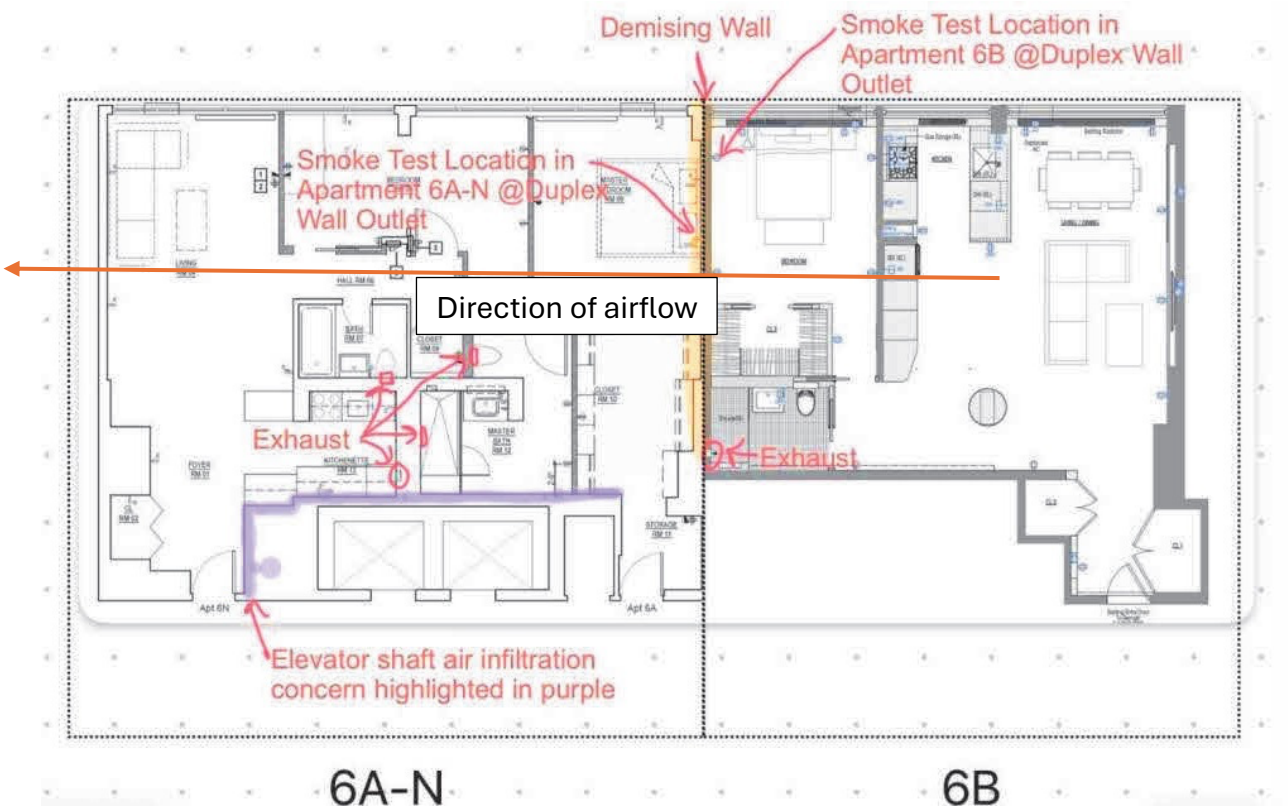
EPA
PM2.5


Demising Wall
Smoke Test Location in Apartment 6B @Duplex Wall Outlet
Smoke Test Location in Apartment 6A-N @Duplex Wall Outlet
Direction of airflow
Exhaust
Exhaust
Elevator shaft air infiltration concern highlighted in purple
6A-N
6B