Testimony

of

Daniel Kass
Deputy Commissioner, Division of Environmental Health
New York City Department of Health and Mental Hygiene

before the

New York City Council Committee on Environmental Protection

regarding

Intro. 194 Clean Heating Oil in New York City

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250 Broadway
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Good morning Chairperson Gennaro and members of the Committee on Environmental Protection. My name is Daniel Kass, Deputy Commissioner for Environmental Health at the New York City Department of Health and Mental Hygiene. On behalf of Commissioner Farley, I would like to thank you for the opportunity to testify regarding Intro 194 related to use of clean heating oil in NYC. I will briefly touch on the health risks of pollution attributable to the use of residual fuel combustion, the health benefits of the proposed reduction in sulfur content, and the emissions reduction that will be associated with this bill.

There is a large body of scientific evidence linking exposure to air pollution to adverse health outcomes and premature mortality. The air pollutants that are most prevalent in New York City are mainly products of fuel combustion, and include fine particles ($PM_{2.5}$) and gaseous pollutants such as nitrogen dioxide (NO_2) and sulfur dioxide (SO_2).

Fine particles are small airborne pieces of solid material composed of many different elements and metals. Once inhaled, fine particles can penetrate deep into the lungs, causing inflammation of the airways and blood vessels. Research has shown that chronic exposures to fine particles can increase the prevalence and severity of respiratory and cardiovascular illnesses, and premature mortality. Cardiovascular disease in NYC is the number one cause of death, killing over 22,500 people each year.

Nitrogen dioxide is emitted when fuels are burned at high temperatures. It causes irritation of the lungs and has been linked to emergency department visits and hospital admissions for respiratory illnesses, including asthma. Nitrogen oxides also contribute to the formation of ozone and $PM_{2.5}$.

Sulfur dioxide is produced by burning sulfur-containing fuels. In New York City, where we long ago eliminated the burning of coal, the principal source of sulfur dioxide is from the burning of No. 4 and No. 6 fuel oils, which have the highest sulfur content of all the fuels commonly used for heating. Sulfur dioxide can exacerbate asthma, and may contribute to other forms of respiratory and cardiovascular illness. Residual fuel oil emissions contain large amounts of sulfur, nickel, vanadium, and other metals. As a result, burning No. 6 residual fuel oil releases $PM_{2.5}$ with relatively higher levels of nickel. Likewise, No. 4 fuel oil, which is a mix of No. 6 residual oil and cleaner-burning distillate oil, also increases airborne nickel concentrations.

Growing scientific evidence suggests that fine particles from residual oil burning may have especially strong adverse health effects. Laboratory research, including animal exposure studies and human cell studies, suggest that these particulates can directly impact the respiratory and cardiovascular systems, as well as cause changes in the immune system. Two recent epidemiologic studies show that $PM_{2.5}$ with higher nickel content may have greater health effects in humans than other particulates.

In 2007, PlaNYC charged the Health Department with developing the New York City Community Air Survey (NYCCAS), one of the largest urban air pollution studies conducted to date. Launched in December 2008, NYCCAS involves measurements of street-level air pollution at 150 locations throughout the city, in every season of the year.

NYCCAS set out to evaluate how air quality varies across the city. Our first report on winter-time air pollution, released in December 2009, demonstrated that the strongest predictor of $PM_{2.5}$ and SO_2, was the density of nearby buildings, and specifically the density of buildings burning fuel oil. Another way to state this is that areas with the greatest concentration of buildings burning these fuels had the highest levels of levels of $PM_{2.5}$ and SO_2.

Earlier this week, we issued a second report, detailing the variation in airborne concentrations of the metal nickel across New York City. The principal source of nickel in New York City is from the burning of No. 4 and No. 6 oil. Nickel levels were highest in neighborhoods with the highest density of boilers burning these fuels, principally in Manhattan and the Bronx, and in parts of Queens. Nickel levels in areas with a high density of No. 4 and No. 6 oil burning units were nearly four times those in areas with low density of these units. In fact, the difference in the number of these boilers explained about 60% of the variability in nickel across the city.

NYCCAS air monitoring also found that sulfur dioxide levels were 1.5 times greater in areas of high, compared to low, density of No. 4 and No. 6 burning units, explained by the high sulfur content of residual fuel oils. Again, the difference in the number of these boilers explained about 50% of the variability across the city.

The levels of these pollutants in NYC contribute to significant illness and loss of life, and scientific evidence suggests that the combined exposures to multiple urban air pollutants may be especially harmful. Preliminary analyses indicate that current $PM_{2.5}$ levels in New York City are associated with potentially thousands of premature mortalities and hospital admissions due to respiratory and cardiovascular illness annually. By extension, even modest incremental reductions in the emissions of these most harmful pollutants will have significant public health benefits and increase life expectancies. Although the precise health benefits of a residual oil phase-out strategy are currently unknown, epidemiological evidence indicates that reducing exposures to harmful air pollutants, particularly those linked to No. 4 and No. 6 fuel combustion would result in a reduction in the number of asthma hospitalizations, heart attacks, reduced prevalence of cardiovascular disease, and reductions in the number of premature deaths.

Thank you for the opportunity to testify. We would be pleased to answer any questions.