



104 East 25th St
New York, New York 10010
www.atc-enviro.com
212.353.8280
Fax 212.353.8306

March 6, 2002

Mr. Bernard P. Orlan
Director, Environmental Health and Safety
New York City Board of Education
28-11 Queens Plaza North
Long Island City, NY 11101

**Re: Air Sampling for Formaldehyde, Ozone, Oxides of Nitrogen and Sulfur Dioxide
High School of Economics and Finance
ATC Project No. 15-19125-0291**

Dear Mr. Orlan:

ATC Associates, Inc. (ATC) is pleased to provide this report of air sampling for formaldehyde (HCHO), ozone (O₃), oxides of nitrogen (NO₂ and NO) and sulfur dioxide (SO₂) conducted on February 23, 2002, at the referenced school. The New York City Board of Education (BOE) requested this sampling to evaluate the air quality inside and outside the building. The results of hydrocarbon samples collected at the same time as the above are described in a separate report.

Scope of Work

ATC collected two (2) samples for each analyte. The samples were collected outside the main entrance and in the lobby near the elevators. The samples were sent to PSC Analytical Services, Inc., an American Industrial Hygiene Association-accredited laboratory in Reading, PA. One blank for each analysis was also submitted. Copies of the analytical reports are in Attachment 1.

Samples for HCHO were collected using 2, 4-dinitrophenylhydrazine (DNPH) tubes connected to battery-powered sampling pumps calibrated to collect 0.25 liters of air per minute. Analysis for HCHO was performed by NIOSH Method 2016

The samples for O₃ were collected using treated glass fiber filters connected to battery-powered sampling pumps calibrated to collect 0.5 liters of air per minute. O₃ analysis was performed by OSHA Method 214.

The NO₂ and NO samples were collected using sorbent tubes connected to battery-powered sampling pumps calibrated to collect 0.025 liters of air per minute. Analysis was performed by NIOSH Method 6014.

The SO₂ samples were collected using treated 37 mm filters connected to battery-powered sampling pumps calibrated to collect 1.0 liter of air per minute. Analysis was performed by NIOSH Method 6004.

Wagdi Abdelshahid, Industrial Hygienist from ATC's New York City office, collected the samples. The samples were collected according to accepted industrial hygiene sampling techniques. The results represent the conditions on the day the samples were collected. Photographs showing the sampling equipment and locations are provided in Attachment 2.

CONFIDENTIAL,

CITY_21MC100_003463215

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

Mr. Bernard P. Orlan
Air Sampling for Formaldehyde & Ozone
H. S of Economics & Finance (833M)

March 6, 2002
Page 2
ATC Project No. 15-19125-0291

Results

Formaldehyde (HCHO)

HCHO was *not detected* at levels above the limit of detection for the analysis (0.5 micrograms per sample or <0.027 parts per million) in either the outdoor or the indoor sample.

Ozone (O₃)

O₃ was detected in both samples and in the blank. The results are shown in the table:

TABLE 1
O₃ Concentrations
February 23, 2002

Sample Location Sample No.	O ₃ per sample (micrograms)	Vol. (liters)	O ₃ Conc. (ug/m ³)*	O ₃ Conc. Blank corrected (ug/m ³)
Outdoors by Main entrance/OZ-01	15.0	90	167	65.4
1 st Floor by elevators OZ-02	9.76	90	108	7.2
Blank OZ-03	9.11	--	--	--

* micrograms per cubic meter of air **Below Detection Limit

The EPA's primary ambient air quality standard for O₃ is 235 ug/m³, one-hour average. The Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limit (PEL) for O₃ is an 8-hour time-weighted average of 0.2 mg/m³ (200 ug/m³). This is almost double the level that was detected indoors. O₃ is a common pollutant in urban air and is a principal component of the ground-level pollution known as "smog". As New York City is classified by the EPA as a "severe" non-attainment area with respect to smog, the presence of detectable levels of O₃ is not unexpected.

Oxides of Nitrogen (NO₂ and NO)

Nitrogen dioxide (NO₂) and nitric oxide (NO) were detected in the lobby sample, only NO₂ was detected outdoors. NO₂ and NO were not detected in the blank. The results are shown in Table 2:

TABLE 2
NO₂ & NO Concentrations
February 23, 2002

Sample Location Sample No.	NO ₂		NO	
	*mg/m ³	**ppm	mg/m ³	ppm
Outdoors by Main entrance/NO-01	0.330	0.175	***BDL	BDL
1 st Floor by elevators NO-02	0.247	0.131	0.230	0.187

* milligrams per cubic meter **parts per million ***Below Detection Limit

CONFIDENTIAL,

CITY_21MC100_003463216

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

Mr. Bernard P. Orlan
Air Sampling for Formaldehyde & Ozone
H. S of Economics & Finance (833M)

March 6, 2002
Page 3
ATC Project No. 15-19125-0291

OSHA has a Permissible Exposure Limit (PEL) for NO₂ of 1 ppm (ceiling concentration, not to be exceeded in 8 hours) and a PEL for NO of 25 ppm (8-hour time-weighted average). These are occupational standards and are not generally applicable to indoor air quality in schools. The federal and New York State ambient air quality standard for NO₂ is 0.05 ppm (12-month average), there is no standard for NO.

These results are from short-term (4-hour) samples and cannot be directly compared to the ambient air standard which is averaged over a full year. Results for both NO₂ and NO were well below the OSHA PELs. Oxides of nitrogen from various combustion sources are the main source of the ozone that creates the smog mentioned above. The presence of oxides of nitrogen in ambient air is not unexpected.

Sulfur Dioxide (SO₂)

SO₂ was detected in both samples and in the blank. The concentration in the blank exceeded that of the outdoor sample. The results are shown in Table 3:

TABLE 3
SO₂ Concentrations
February 23, 2002

Sample Location Sample No.	SO₂ per sample (micrograms)	Vol. (liters)	SO₂ Conc. (mg/m³= ppm)	SO₂ Conc. Blank- corrected (mg/m³)	SO₂ Conc. Blank- corrected (ppm)
Outdoors by Main entrance / SO-01	12.8	200	0.0640= 0.0244	BDL	BDL
1 st Floor by elevators / SO-02	20.7	200	0.104= 0.0395	0.022	0.008
Blank / SO-03	16.3	--	--	--	--

OSHA has a Permissible Exposure Limit (PEL) for SO₂ of 5 ppm (8-hour time-weighted average). This is an occupational standard and is not generally applicable to indoor air quality in schools. The federal and New York State ambient air quality standard for SO₂ is 0.03 ppm (12-month average).

These results are from short-term (3-hour) samples and cannot be directly compared to the ambient air standard which is averaged over a full year. Results for SO₂ were well below the OSHA PEL. SO₂ is a common pollutant in urban air, much of the SO₂ in air on the East Coast of the United States is attributed to emissions from coal-burning power plants in the Midwest. The presence of oxides of SO₂ in ambient air is not unexpected.

Conclusion

Based on the results of the air sampling described above, ATC concludes that there is no significant exposure to these substances at the locations tested. Additional sampling does not appear necessary.

CONFIDENTIAL,

CITY_21MC100_003463217

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

Mr. Bernard P. Orlan
Air Sampling for Formaldehyde & Ozone
H. S of Economics & Finance (833M)

March 6, 2002

Page 4

ATC Project No. 15-19125-0291

ATC appreciates the opportunity to provide this air quality service to the BOE. Please call me at (212) 353-8280 extension 212 if you have any questions.

Sincerely,
ATC Associates, Inc.

A handwritten signature in black ink, appearing to read 'James R. Cohn', with a stylized, looping flourish at the end.

James R. Cohn, CIH, CSP
Regional Manager
Industrial Hygiene Division

Attachment

CONFIDENTIAL,

CITY_21MC100_003463218

SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008