



July 29, 2011

Ms. Latha Thompson
District Manager
Community Board 8
505 Park Avenue
Suite 620
New York, NY 10022

Re: Second Avenue Subway Task Force Meeting Request for August 10

Dear Ms. Thompson:

We are in receipt of your invitation to a special meeting of the Second Avenue Subway Task Force to discuss air quality issues related to project construction and welcome the opportunity to have an informed discussion on this matter. At this time, we recommend having such a meeting in September 2011 when our air quality study will be completed.

MTA Capital Construction has detailed requirements and mitigations in our Environmental Impact Statement (see FEIS Chapter 11 "Air Quality" and Appendix I, "Air Quality" at <http://mta.info/capconstr/sas/feis.htm>) and construction contract documents to ensure that air quality is maintained throughout construction.

To ensure air quality compliance, the Second Avenue Subway contract documents require contractors to implement the following measures during construction:

- Wet down all muck removed from shafts and the launch box
- Wet down trucks as a supplemental measure if excessive drying occurs
- Cover truck loads before they leave the construction sites
- Utilize water hoses to knock down dust emanating from above-grade hoe-ram and sweeping activities
- Utilize blast mats and wetting equipment during blast operations

A Community Air Monitoring Program (CAMP) has been implemented following New York State Department of Environmental Conservation and New York State Department of Health Guidance (DER-10 Technical Guidance for Site Investigation & Remediation, see attached). Pollutant "alert levels" have been established to indicate when action is required to reduce air-borne pollutants caused by construction activity.

The agencies of the MTA

MTA New York City Transit
MTA Long Island Rail Road

MTA Long Island Bus
MTA Metro-North Railroad

MTA Bridges and Tunnels
MTA Capital Construction

MTA Bus Company

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The "alert levels" are conservatively based on 15 minute samples to provide a measure of protection for the downwind community. Real-time monitoring of particulates (PM-10, a standard used to describe the size of particulate matter 10 micrometers or less in diameter) and volatile organic compounds (VOC) is performed, and if the "alert levels" are exceeded, corrective measures must be implemented by the contractor. If, despite corrective action, particulate or VOC exceedances of the alert level persist above specified "stop-work limits" which also are established for the particular pollutant based on the conservative 15-minute samples, the contractor is required to stop the activity, reevaluate the corrective action measures and implement additional mitigation.

In recognition of community impacts from our cavern mining work, we are erecting muck handling enclosure systems at the 69th and 72nd Street shaft locations to reduce dust and noise in the area. Air quality monitors located throughout the construction zones are monitored on a continual basis. Should these monitors be activated, the incident is investigated and mitigation measures are implemented.

The smoke and odor coming from the shafts after blasting are the combustion byproducts from the Emulex explosive material used in the blasting. Sampling and testing of Emulex emissions have been conducted on the MTACC East Side Access Project (see attached). ***These emissions do not violate any health-based standard although we recognize that they may sometimes generate short-term nuisance odors.*** Nevertheless, in an effort to reduce odors as well as dust from blasts, atomizing water cannons were recently installed not only where blasting is underway at the East Side Access Project – and their use has reduced complaints there – but also in the Second Avenue tunnels and underground cavern areas to mitigate the impact of dust, smoke and odors resulting from blasting activities. We will continue to monitor construction activities in the tunnels and on the surface to ensure that the contractors follow best practices and evaluate the effectiveness of mitigation measures as they are implemented.

We continue to work with the New York City Department of Sanitation (DSNY) to address the regular and timely removal of garbage from the area surrounding our construction zones, which is another source of odors. DSNY and the Business Integrity Commission (BIC), which is responsible for private carters, have implemented special arrangements in the impacted area where regular curbside pickup is not available. In an effort to assist with residential garbage, we have established centralized garbage disposal bins. Consolidating garbage drop locations will eliminate unsightly street accumulation, facilitate pick-up by DSNY, and help to mitigate vector related issues.

In addition to these mitigation measures, MTACC is contracting with its consultant construction manager, Parsons Brinckerhoff (PB), on a study to verify that emissions from our construction activities do not have the potential to violate any health-based standards. PB is contracting with

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experts in the fields of dust and odor control. We will provide you with full access to the report and data for review.

We expect the study results in approximately six weeks, allowing for an informed discussion on this subject at a September 2011 meeting.

Thank you for your attention to this matter. Please contact Alissa Kosowsky, NYC Transit Government and Community Relations, at 646-252-2656, to discuss meeting dates in September.

Sincerely,

A handwritten signature in blue ink, appearing to read 'W. Goodrich', written over the word 'Sincerely,'.

William E Goodrich, P.E.
Senior Vice President
Program Executive
Second Avenue Subway Project

Cc: M. Horodniceanu
G. Johnson
A. Semancik
L. Tandler



Division of Environmental Remediation

DER-10

TECHNICAL GUIDANCE

FOR

SITE INVESTIGATION AND REMEDIATION

May 2010

New York State Department of Environmental Conservation
David A. Paterson, *Governor* Alexander B. Grannis, *Commissioner*

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009



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November 19, 2010

Ms. Audrey Heffernan
MTA Capital Construction Co.
2 Broadway, 8th Floor
New York, NY 10004

Re: East Side Access – Park Avenue and East 37th Street Air Monitoring

Dear Ms. Heffernan:

AKRF Inc. (AKRF), on behalf of MTA Capital Construction (MTACC), has been conducting air monitoring in the vicinity of the tunnel vents located near the southwest corner of Park Avenue and East 37th Street in Manhattan. Blasting gases associated with the East Side Access construction, both north of Grand Central Terminal (GCT) (e.g., for the new station caverns) and south of GCT (e.g., for tail track cross passages and fan chambers) are released through these sidewalk vents.

AKRF's monitoring initially included multi-parameter street level monitoring near the vents. However, recorded levels of regulated air pollutants did not approach or exceed health-based criteria so monitoring was subsequently limited to hydrogen sulfide (H₂S). Odor complaints were received, relating to approximately one in four potential odor events (i.e., either a single blast or multiple blasts set off at around the same time but in different locations), from seven residents of 40 Park Avenue (a 90-unit midrise residential building located approximately 100 feet south of the vents) and from a representative of the Union League Club (immediately west of the vents). The odor has been described as "highly noxious", "acrid chemical", and "sulphuric, asphalt-like". Odor complaints, however, do not correspond well with recorded levels of H₂S. At least some of these recorded levels, which have generally been below most people's odor threshold, are likely due to malfunctioning of equipment that measures contaminant levels and do not reflect actual exceedances.

Street Level Air Monitoring

Beginning on July 15, 2010, AKRF conducted air monitoring with portable real-time five-gas meters (VRAEs) at several locations at street level in the vicinity of the tunnel vents (see aerial photo on Table 1). Monitoring results are summarized in Table 1A. In general, observable increases in odors and/or meter readings (particularly for carbon monoxide and nitric oxide) would typically begin about 5 to 20 minutes following the blast (with the shorter times for blasts closer to the vents) and drop to background levels within an hour. Street level readings decreased significantly with distance from the vents.

Pollutants of concern for blasting operations were researched based on both published data and discussions with the MTA, their contractors and the explosive manufacturer. In particular, compounds monitored for included those for which the United States Environmental Protection Agency (US EPA) has established 1-hour National Ambient Air Quality Standards (NAAQS). NAAQS are health-based standards *"to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly"*. Results of monitoring conducted from a few minutes before each blast until an hour or more after the blast indicated that carbon monoxide (CO), nitrogen dioxide (NO₂), and sulfur

dioxide (SO₂) levels attributable to blasts were well below the federal health-based standards. Nitric oxide (NO) was detected, but there is no applicable short-term standard or guideline. Ammonia (NH₃) was also monitored for but not detected above the New York State guideline level (there is no Federal standard).

Levels of H₂S were below the health-based standard, EPA's Acute Exposure Guideline Level of 0.51 parts per million (ppm), a one-hour average level at which EPA found that *"the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure."* Some measured one-hour average levels were, however, above the New York State (NYS) one-hour average nuisance odor (i.e., not health-based) standard of 0.01 ppm, ranging from not detectable to 0.2 ppm.

40 Park Avenue Air Monitoring

Multi-parameter Monitoring

In addition to street level monitoring, on July 31, 2010, AKRF began conducting air monitoring in the lobby, and on an upper floor hallway, balcony, and interior of an apartment (location kept confidential) facing Park Avenue. Table 1B shows summary results from sampling with VRAEs for NH₃, CO, H₂S, NO, NO₂, and SO₂. The VRAEs were generally left running for a 24-hour period. Blast-related levels were elevated but well below applicable health-based standards. Elevated levels were also recorded at times when no blasts were occurring, indicating other sources of these pollutants in the area.

Hydrogen Sulfide Monitoring

Beginning on August 5, 2010, monitoring was conducted for H₂S using Jerome Model 631X analyzers, which were reportedly more sensitive – able to detect very low levels of H₂S – compared to the VRAEs. Initial results indicated instantaneous (i.e., not one-hour average) H₂S levels following a blast ranged from 0.008 to 0.36 ppm at street level compared to 0.005 to 0.02 ppm on a balcony. This and subsequent monitoring indicated one-hour average levels on the balcony never exceeded the health-based guidance level and generally did not exceed the nuisance odor-based standard.

Odor complaints have been logged for 40 out of 167 potential odor events (total of 224 blasts). The nuisance odor-based standard of 0.01 ppm was marginally exceeded (0.011 ppm on August 10, 2010) only once when an odor was reported. The monitor did not detect H₂S during most blast events and detected elevated levels at other times that were thought to be a result of equipment malfunction. The manufacturer of the equipment was consulted regarding these results. On August 19, 2010, the Jerome 631X equipment was replaced with the newly available, Jerome 605 model. In addition to monitoring on the balcony, a second Jerome 605 monitor was placed within the tunnel (directly below the vents) for several blasts. The maximum detected instantaneous level on the balcony was 0.009 ppm compared to 0.2 ppm in the tunnel, which occurred soon after a blast. Between August 20th and October 20th a Jerome 605 monitor was then left running on the balcony and only indicated non-zero levels of H₂S whenever the equipment "regenerated" (the sensor was designed to reset itself after a certain number of readings or other conditions and would then give false positive readings for half an hour or more until readings returned to zero). On October 14, 2010, the equipment malfunctioned, consistently showing high readings not at the time of a blast and without apparent source and was returned to the manufacturer. A replacement monitor installed on October 25th has given no detectable readings since. Table 2 shows a list of all blasts with odor complaints and the corresponding results.

Relationship between Blasts and Odor Complaints

Table 3 shows a list of all 224 blasts since the odor complaints commenced, with 52 blasts highlighted (some occurring around the same time), which resulted in an odor detection complaint. Generally, odor complaints appeared to correlate well with the time of blasts. However, there is no obvious pattern of complaints correlating with quantity of explosive or blast location. The majority of blasts have occurred at night north of GCT, with only 13 occurring in the tail track tunnels (during the day). Three complaints were received regarding the daytime blasts, indicating a similar odor detection rate for blasts both north and south of GCT.

Odor Neutralizing System and other Mitigation Efforts

Gases from the blasts north of GCT pass through particulate scrubbing equipment (located in the tunnels just south of GCT). During the week of August 10, 2010, a Piian® odor neutralizer with a “sweet” odor was introduced into the air just south of the scrubbers following some of the blasts. This odor neutralizer is used by a variety of facilities (including sewage treatment plants which can release hydrogen sulfide) and is intended to work through absorption and biodegradation. However, based on observations, both by 40 Park Avenue residents and MTA/Contractor employees, the product did not effectively neutralize blasting odors, and was instead simply adding to the blast odors. Modification of the odor control system is planned in order to introduce the neutralizing agent in a manner that more effectively mixes it with the blast gases.

For blasts occurring south of the scrubbing equipment, wetted burlap curtains are drawn over the base of three vertical shafts that connect the tunnel to the sidewalk vents. There is also additional wetting/misting of the blast gases at the top of two shafts (the third shaft is mostly filled by the access elevator).

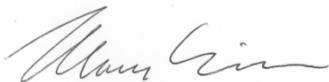
In the 40 Park Avenue apartment where monitoring was performed, on September 17th, the standard filter in one of the apartment’s two air conditioning units was replaced with an activated carbon filter. The narrowness of the slot for the filter in other air conditioning unit prevented its replacement. According to the apartment’s occupant, the filter has had no apparent effect on odor infiltration.

CONCLUSIONS AND RECOMMENDATIONS

The comprehensive air monitoring of regulated air pollutants has indicated no exceedances of health-based standards. Although slight exceedances of the H₂S nuisance odor standard were detected at certain times, at least some of these exceedances were likely the result of monitoring equipment malfunction. A variety of mitigation measures have been employed to mitigate the odor. It is possible that upgrades to the odor neutralizing system could make it more effective. It may also be helpful to consult with a toxicologist who can determine more exactly the mixture of regulated and unregulated gases that are causing the complaints.

Please do not hesitate to contact me at (646) 388-9527 if you have any questions.

Sincerely,
AKRF, Inc.



Marcus Simons
Senior Vice President

Table 1 - Comparison of Monitoring Results to One Hour Air Quality Standards

Table 1A - Street Level Monitoring - Blasts July 23 through August 3, 2010

Parameter ¹	Health Based Standard ² (1-hour average)	Odor-Based Standard ³ (1-hour average)	Range of Values Detected					
			Location A	Location B	Location C	Location D	Location E	Location F
Carbon Monoxide (CO)	35		0.8 - 7.4	0.7 - 8.4	0.3 - 6.2	0.09 - 5	nd - 4.2	nd - 3.1
Hydrogen Sulfide (H ₂ S)	0.51	0.01	nd - 0.003	nd - <u>0.015</u>	0.004	nd - <u>0.12</u>	nd - <u>0.2</u>	*
Nitrogen Dioxide (NO ₂)	0.1		nd - 0.01 ⁴	*	*	nd	*	nd - 1.2 ⁴
Sulfur Dioxide (SO ₂)	0.075		nd - 0.004	nd	nd - 0.004	nd	nd	*

Table 1B - 40 Park Avenue Monitoring - Blasts July 31 through August 3, 2010

Parameter ¹	Health Based Standard ² (1-hour average)	Odor-Based Standard ³ (1 hour average)	Range of Values Detected			
			9th Floor Balcony	Inside Apartment	9th Floor Hallway	Building Lobby
Carbon Monoxide (CO)	35		nd - 1.075 ⁵	nd - 3 ⁵	nd - 0.4	nd - 3.95 ⁵
Hydrogen Sulfide (H ₂ S)	0.51	0.01	nd	nd	*	nd
Nitrogen Dioxide (NO ₂)	0.1		*	*	nd - 0.59 ⁶	*
Sulfur Dioxide (SO ₂)	0.075		nd - 1.18 ⁶	nd	*	*

Notes

- units All values are 1 hour averages in parts per million (ppm)
- * Parameter not monitored at this location
- nd Not detected above the limit of detection
- xx Exceeds Odor-Based Standard
- 1 Ammonia (NH₃) was also monitored for but not detected above the NYS guideline level. Nitric oxide (NO) levels were ND to 1.9 ppm, but there is no short-term standard or guideline.
- 2 Health-based standards are all National Ambient Air Quality Standards (NAAQS) with the exception of H₂S, which is an EPA Acute Exposure Guideline Level indicating that: *"the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure."*
- 3 New York State Ambient Air Quality Standard
- 4 Detected levels are attributable background (traffic): NO₂ not detected in monitoring close to vents
- 5 Comparable CO readings at other times (i.e., seemingly not attributable to blast)
- 6 Similar exceedances of standards at other times (i.e., seemingly not attributable to blast)



Table 2 - Odor Incidents and Correlating Blasting Activity

Incident Report Data ¹					Blast Data ²				Balcony Monitoring Data ³		
Incident											
Report #	Incident reported by	Date	Time Odor Detected	Duration of odor event	Blast Number(s)	Blast location	Actual Time of blast	Amt of explosives (lbs) ²	H2S Average ³	H2S Maximum ³	
1	Resident 1	6/28/2010	11pm	30 mins	GCTWC-63; GCTEC-50	45th/46th and Park; 47th/48th and Park	10:42 PM; 10:43 PM	177; 329		NA	NA
2	Resident 1	6/29/2010	9pm	NA	GCTEC-51	47th/48th and Park	8:44 PM	266		NA	NA
3	Resident 1	7/8/2010	11pm	30 mins	GCTEC-55	47th/48th and Park	10:47 PM	204.76		NA	NA
4	Resident 1	7/9/2010	3pm	10 mins	TT1-17	37th/38th and Park	2:45 PM	143		NA	NA
5	Resident 1	7/14/2010	2:30am	30 mins	GCTWC-73	47th/48th and Park	2:07 AM	400.04		NA	NA
6	Resident 2	7/15/2010	night time	NA	GCTWC-75; GCTWC-74; GCTEC-59	47th/48th; 47th/48th; 44th/45th and Park	2:03 AM; 10:42 PM; 10:44 PM	79.92; 158.36; 263.44		NA	NA
7	Resident 3; Resident 4	7/20/2010	3:40pm	at least until 4:15pm	TT1-18	37th/38th and Park	3:32 PM	966.8		NA	NA
8	Resident 1	7/20/2010	11:00pm	30 mins	GCTWC-80; GCTEC-61	44th/45th; 47th/48th and Park	10:47 PM; 10:47 PM	239.76; 300.44		NA	NA
9	Resident 5	7/23/2010	3:00am	NA	GCTWC-85	47th/48th and Park	2:42 AM	270.36		NA	NA
10	Resident 1	7/26/2010	11:42pm	18 mins	GCTEC-38; GCTEC-64	46th/47th and Park; 48th/49th and Park	10:45 PM; 10:46 PM	370.28; 291.96		NA	NA
11	Resident 1	7/28/2010	3:00AM	40 mins	GCTWC-89; GCTEC-40	47th/48th and Park; 46th/47th and Park	2:31 AM; 2:31 AM	266.64; 298.8		NA	NA
12	Resident 1	8/2/2010	11:30pm	20 mins	GCTEC-70; GCTEC-71	46th/47th and Park	10:52PM; 10:52 PM	149.28; 301.92	0.0		0.0
13	Resident 1	8/3/2010	11:15pm	15 mins	GCTEC-68	46th/47th and Park	10:43 PM	299.52	0.0		0.0
14	Resident 1	8/4/2010	11:03pm	17 mins	GCTEC-72	47th/48th and Park	10:43 PM	260.48		NA	NA
15	Resident 1	8/5/2010	11:03pm	37 mins	GCTEC-73	47th/48th and Park	10:42 PM	353		NA	NA
16	Resident 1	8/9/2010	11:45pm	30 mins	GCTEC-74	47th/48th and Park	10:44 PM	275	0.007 ppm	0.008 ppm	
17	Resident 1; Resident 5	8/10/2010	11:30pm	40 mins	GCTEC-75; GCTWC-96	47th/48th and Park; 46th/47th and Park	10:49 PM; 10:48 PM	299.8; 335.8	0.011 ppm	0.012 ppm	
18	Resident 1; Resident 5	8/11/2010	11:33pm	7 mins	GCTEC-76	47th/48th and Park	10:41 PM	296.5	0.003 ppm	0.005 ppm	
19	Resident 1	8/12/2010	11:27pm	35 mins	GCTEC-77	47th/48th and Park	10:44 PM	290.1	0.003 ppm	0.006 ppm	
20	Resident 1	8/16/2010	11:18pm	NA	GCTEC-78	47th/48th and Park	10:46 PM	402	0.006 ppm	0.020 ppm	
21	Resident 1	8/17/2010	2:17am	at least until 3:20am	GCTWC-101	44th/45th and Park	2:01 AM	340.3	0.007 ppm	0.015 ppm	
22	Resident 1	8/18/2010	11:09pm	8 mins	GCTWC-103	44th/45th and Park	10:46 PM	392.2		NA	NA
23	Resident 1	8/30/2010	11:14pm	20 mins	TAA-26	48th/49th and Park	10:46 PM	244.64	0.002 ppm	0.011 ppm	
24	Resident 1	9/1/2010	3:45 am	24 mins	TAA-27	48th/49th and Park	3:03 AM	152.44	0.002 ppm	0.011 ppm	
25	Resident 1	10/13/2010	9:20pm	not provided	GCTEC-99	48th/49th and Park	8:45 PM	101.92	0.0003 ppm	0.004 ppm	
26	Resident 1	10/15/2010	11:10pm	not provided	GCTEC-103	48th/49th and Park	10:47 PM	175.92		EE	EE
27	Resident 1	10/18/2010	11:10pm	52mins	GCTEC-106	48th/49th and Park	10:44 PM	240.12		EE	EE
28	Resident 1	10/20/2010	1:44am	not provided	GCTEC-108	48th/49th and Park	12:14 PM	198.12		EE	EE
29	Resident 1	10/21/2010	3:35am	45 mins	GCTEC-109	45th/46th and Park	3:15 AM	1317.36		NA	NA
30	Union League Club	10/22/2010	12:00pm approx	until 3:52pm	GCTEC-110	47th/48th and Park	12:13 PM	121.88		NA	NA
31	Resident 5	10/25/2010	9:30pm	9:57pm	GCTEC-112	47th/48th and Park	8:45 PM	233.68	0.0		0.0
32	Resident 5	10/26/2010	4:10am	not provided	GCT3XVR-20; SC53-2; GCTWC-108	50th/51st and Park; 53rd and Park; 44th/45th and Park	3:32 AM; 3:30 AM; 3:31 AM	220; 229.24; 125.08	0.0		0.0
33	Resident 5; Resident 6	10/26/2010	11:20pm	not provided	GCTEC-114	47th/48th and Park	10:46 PM	212.52	0.0		0.0
34	Resident 1	11/3/2010	1:05AM	40 mins	GCTEC-120; GCTEC-121	47th/48th and Park	12:38 AM	313.6; 347.6	0.0		0.0
35	Resident 1; Resident 5	11/6/2010	4:30am	not provided	GCTEC-127; GCT3XVR-27	46th/47th and Park; 50th/51st and Park	3:46 PM	953.04; 54.2	DD		DD
36	Resident 1	11/8/2010	11:02pm	56 mins	GCTEC-126; GCTEC-128	47th/48th and Park	10:49 PM	529; 324.12	DD		DD
37	Resident 1	11/10/2010	4:05am	54 mins	GCTEC-129; GCTEC-130	47th/48th and Park	3:46 AM	324.6; 350.76	DD		DD
38	Resident 1	11/11/2010	3:57am	60 mins	GCTEC-132; GCT3XVR-29	47th/48th and Park; 50th/51st and Park	3:30 AM	270.48; 237.72	DD		DD
39	Resident 1	11/12/2010	4:01am	16 mins	GCTEC-133; GCT3XVR-30	47th/48th and Park; 50th/51st and Park	3:31 AM	232.68; 25.48	DD		DD
40	Resident 1	11/12/2010	11:01pm	42 mins	GCTEC-135	46th/47th and Park	10:46PM	1635	DD		DD

Additional Notes

¹ Odor has been described as "acrid chemical", "sulphuric, asphalt-like", "late night highly noxious odor". When asked no "rotten egg" odors were noticed. When odor neutralizer was used odor was reported as "sickly sweet".

² Explosives used by the contractor are Emulex and Red-D-Lite

³ AKRF monitoring on a balcony of 40 Park Avenue began on July 31, 2010; Results indicate maximum and one-hour averages.

NA - Data not available / No monitor on balcony

EE - Equipment error

DD - Data not yet downloaded from monitor at the time of this report

Table 3 - All ESA Blasts between 6/28/2010 - 11/13/2010

Blast Number	Date	Actual Time of Blast	Location	Pounds of Explosive
38FCE-3	6/28/2010	1235	37th/38th and Park	251.2
GCTWC-63	6/28/2010	2242	45th/46th and Park	177
GCTEC-50	6/28/2010	2243	47th/48th and Park	329
GCTEC-51	6/29/2010	2044	47th/48th and Park	266
GCTWC-62	6/29/2010	2044	44th/45th and Park	35
SFT2-8	6/30/2010	2045	(Madison Yard) 45th and Park	375.76
GCTWC-64	7/1/2010	2044	44th/45th and Park	81.36
GCTWC-65	7/1/2010	2044	45th/46th and Park	185.08
GCTEC-52	7/1/2010	2045	47th/48th and Park	260.16
GCTEC-53	7/6/2010	2247	47th/48th and Park	276.12
ES4SL-1	7/7/2010	0206	(Madison Yard) 48th and Park	160.2
SFT2-9	7/7/2010	0214	(Madison Yard) 45th and Park	343.2
GCTWC-66	7/7/2010	2242	45th/46th and Park	165.84
GCTWC-68	7/7/2010	2244	44th/45th and Park	79.8
GCTEC-54	7/7/2010	2247	47th/48th and Park	253.64
ES4SL-2	7/8/2010	0158	(Madison Yard) 48th and Park	169.8
GCTEC-55	7/8/2010	2247	47th/48th and Park	204.76
ES4SL-3	7/9/2010	0257	(Madison Yard) 48th and Park	79.2
GCTWC-67	7/9/2010	0258	47th/48th and Park	639
TT1-17	7/9/2010	1445	37th/38th and Park	143
GCTWC-71	7/10/2010	0209	47th/48th and Park	275.72
GCTEC-56	7/12/2010	1340	47th/48th and Park	241.28
GCTWC-70	7/12/2010	2243	44th/45th and Park	176.92
GCTEC-57	7/13/2010	0331	47th/48th and Park	242.72
GCTWC-69	7/13/2010	0332	47th/48th and Park	651.72
GCTEC-58	7/13/2010	2254	47th/48th and Park	250.08
GCTWC-72	7/13/2010	2254	45th/46th and Park	151.52
GCTWC-73	7/14/2010	0207	47th/48th and Park	400.04
GCTWC-75	7/15/2010	0203	47th/48th and Park	79.92
GCTWC-74	7/15/2010	2242	44th/45th and Park	158.36
GCTEC-59	7/15/2010	2244	47th/48th and Park	263.44
SFT2-10	7/16/2010	0217	(Madison Yard) 45th and Park	624.8
GCTWC-77	7/16/2010	2246	47th/48th and Park	372.92
GCTWC-76	7/19/2010	2247	44th/45th and Park	144.1
GCTEC-60	7/19/2010	2248	47th/48th and Park	297.48
GCTWC-79	7/20/2010	0202	47th/48th and Park	162.16
TT1-18	7/20/2010	1532	37th/38th and Park	966.8
GCTEC-61	7/20/2010	2247	47th/48th and Park	300.44
GCTWC-80	7/20/2010	2247	44th/45th and Park	239.76
GCTWC-81	7/21/2010	0301	47th/48th and Park	315.2
ES4SL-4	7/22/2010	0216	(Madison Yard) 48th and Park	408.32
GCTEC-34	7/22/2010	0217	46th/47th and Park	217.56
GCTEC-62	7/22/2010	0217	48th/49th and Park	330.4
GCTWC-82	7/22/2010	0310	44th/45th and Park	144.72
GCTWC-83	7/22/2010	0310	47th/48th and Park	156.88
SFT2-11	7/23/2010	0212	(Madison Yard) 45th and Park	702.24
GCTEC-36	7/23/2010	0215	46th/47th and Park	279.72
GCTEC-63	7/23/2010	0215	48th/49th and Park	346.32
GCTWC-85	7/23/2010	0242	47th/48th and Park	270.36
GCT1/2W-9	7/24/2010	0246	44th and Park	157.52
GCTWC-78	7/24/2010	0249	47th/48th and Park	335.4
GCTEC-38	7/26/2010	2245	46th/47th and Park	370.28
GCTEC-64	7/26/2010	2246	48th/49th and Park	291.96
GCTWC-84	7/27/2010	0250	44th/45th and Park	145
GCTWC-87	7/27/2010	0250	47th/48th and Park	253.1
TT1-19	7/27/2010	1425	37th/38th and Park	495.72
GCTEC-40	7/28/2010	0231	46th/47th and Park	298.8
GCTWC-89	7/28/2010	0231	47th/48th and Park	266.64
GCTEC-67	7/28/2010	2243	46th/47th and Park	317.04

Blast Number	Date	Actual Time of Blast	Location	Pounds of Explosive
GCTWC-86	7/28/2010	2243	44th/45th and Park	142
ES3WW-1	7/29/2010	0206	(Madison Yard) 47th and Park	19.36
SFT2-12	7/29/2010	0214	(Madison Yard) 45th and Park	907.3
GCTEC-69	7/29/2010	2243	46th/47th and Park	391.08
GCTWC-91	7/29/2010	2243	47th/48th and Park	144
ES3WW-2	7/30/2010	0205	(Madison Yard) 47th and Park	35.2
ES3WW-3	7/31/2010	0206	(Madison Yard) 47th and Park	86.2
TT1-20	8/2/2010	1350	37th/38th and Park	478.32
GCTEC-70	8/2/2010	2252	46th/47th and Park	149.28
GCTEC-71	8/2/2010	2252	46th/47th and Park	301.92
GCTWC-88	8/3/2010	0304	44th/45th and Park	123.24
GCTWC-92	8/3/2010	0304	47th/48th and Park	104.8
GCTEC-68	8/3/2010	2243	46th/47th and Park	299.52
GCTEC-72	8/4/2010	2243	47th/48th and Park	260.48
ES3WW-4	8/5/2010	0209	(Madison Yard) 47th and Park	311.52
SFT2-13	8/5/2010	0217	(Madison Yard) 45th and Park	956.6
GCT1/2W-10	8/5/2010	0254	43rd and Park	95.92
TT1-21	8/5/2010	1150	37th/38th and Park	150.52
GCTEC-73	8/5/2010	2242	47th/48th and Park	353
GCTWC-94	8/6/2010	0301	44th/45th and Park	169.4
GCTWC-95	8/6/2010	0308	47th and Park	176
GCTWC-90	8/7/2010	0338	47th/48th and Park	345.9
GCTEC-74	8/9/2010	2244	47th/48th and Park	275
GCTWC-97	8/10/2010	0235	44th/45th and Park	161.5
TT1-22	8/10/2010	1315	37th/38th and Park	607.2
GCTWC-96	8/10/2010	2248	46th/47th and Park	335.8
GCTEC-75	8/10/2010	2249	47th/48th and Park	299.8
GCTEC-76	8/11/2010	2241	47th/48th and Park	296.5
SFT2-14	8/12/2010	0235	(Madison Yard) 45th and Park	1032
GCTWC-99	8/12/2010	0306	44th/45th and Park	246
GCTEC-77	8/12/2010	2244	47th/48th and Park	290.1
ES3WW-5	8/13/2010	0304	(Madison Yard) 47th and Park	246.8
GCTWC-93	8/13/2010	0306	46th/47th and Park	291.1
TAA-25	8/13/2010	2245	48th/49th and Park	275.3
GCTWC-100	8/13/2010	2246	47th/48th and Park	177.9
GCTEC-78	8/16/2010	2246	47th/48th and Park	402
GCTEC-79	8/17/2010	0046	47th/48th and Park	398.7
GCTWC-101	8/17/2010	0201	44th/45th and Park	340.3
SFT2-15	8/18/2010	0233	(Madison Yard) 45th and Park	173.9
GCTWC-103	8/18/2010	2246	44th/45th and Park	392.2
GCTWC-102	8/19/2010	2245	47th/48th and Park	693
TAA-26	8/30/2010	2246	48th/49th and Park	244.64
SFT2-16	8/30/2010	2314	(Madison Yard) 45th and Park	489.16
TAA-27	9/1/2010	0301	48th/49th and Park	152.44
ES3SL-6	9/2/2010	0259	(Madison Yard) 47th and Park	469
TAA-28	9/2/2010	0259	48th/49th and Park	195.72
GCT3WW-1	9/2/2010	2239	49th and Park	58.88
SFT2-17	9/2/2010	2315	(Madison Yard) 45th and Park	519
TAA-29	9/3/2010	2241	48th/49th and Park	155.76
ES3SL-7	9/11/2010	0204	(Madison Yard) 47th and Park	463.84
SFT2-18	9/14/2010	0202	(Madison Yard) 45th and Park	931.04
ES3SL-8	9/17/2010	2341	(Madison Yard) 47th and Park	444.04
GCTEC-80	9/27/2010	2244	44th/45th and Park	1144.88
GCTEC-81	9/28/2010	2247	44th/45th and Park	1103.52
ES3SL-9	9/29/2010	0203	(Madison Yard) 47th and Park	407.48
GCTEC-82	10/1/2010	0258	44th/45th and Park	1162.48
GCTEC-65	10/4/2010	1116	48th/49th and Park	77.56
GCTEC-83	10/4/2010	2045	48th/49th and Park	70.08
ES3SL-10	10/5/2010	0218	(Madison Yard) 47th and Park	397.68
GCTEC-84	10/5/2010	1119	48th/49th and Park	42.32
GCTEC-85	10/5/2010	2246	48th/49th and Park	83.76
GCTEC-86	10/6/2010	1214	48th/49th and Park	78.72
GCTEC-87	10/6/2010	2045	48th/49th and Park	69.56

Blast Number	Date	Actual Time of Blast	Location	Pounds of Explosive
GCTEC-88	10/7/2010	0330	45th/46th and Park	1755.6
GCTEC-89	10/7/2010	1117	48th/49th and Park	83.16
GCTEC-90	10/7/2010	2047	48th/49th and Park	76.64
GCTEC-91	10/8/2010	1117	48th/49th and Park	84.96
GCTEC-92	10/8/2010	2046	48th/49th and Park	74
GCTEC-93	10/9/2010	0332	45th/46th and Park	1755.6
GCTEC-94	10/11/2010	1117	48th/49th and Park	83.76
GCTEC-95	10/11/2010	2045	48th/49th and Park	99.96
ES3SL-11	10/12/2010	0203	(Madison Yard) 47th and Park	394.68
GCTEC-96	10/12/2010	1119	48th/49th and Park	76.96
GCTEC-97	10/12/2010	2045	48th/49th and Park	122.56
GCT3XVR-12	10/13/2010	0202	50th/51st and Park	52.5
GCTEC-98	10/13/2010	1118	48th/49th and Park	102.52
GCTEC-99	10/13/2010	2045	48th/49th and Park	101.92
GCT3XVR-13	10/14/2010	0330	50th/51st and Park	55.2
GCTEC-100	10/14/2010	0331	45th/46th and Park	1755.6
GCTEC-101	10/14/2010	1117	48th/49th and Park	190.72
GCTEC-102	10/14/2010	2245	48th/49th and Park	179.48
ES3SL-12	10/15/2010	0208	(Madison Yard) 47th and Park	718.88
GCT3XVR-14	10/15/2010	0209	50th/51st and Park	44.54
GCTEC-103	10/15/2010	2247	48th/49th and Park	175.92
GCT3XVR-15	10/16/2010	0300	50th/51st and Park	52.5
GCTEC-105	10/16/2010	0301	45th/46th and Park	1755.6
GCTEC-104	10/18/2010	1129	48th/49th and Park	209.72
GCTEC-106	10/18/2010	2244	48th/49th and Park	240.12
GCT3XVR-16	10/19/2010	0300	50th/51st and Park	88
GCTWC-104	10/19/2010	0301	44th/45th and Park	305.6
GCTEC-107	10/19/2010	2046	48th/49th and Park	196.92
GCT3XVR-17	10/20/2010	0325	50th/51st and Park	134.1
GCTEC-108	10/20/2010	1214	48th/49th and Park	198.12
ES3SL-13	10/21/2010	0202	(Madison Yard) 47th and Park	781.92
GCTEC-109	10/21/2010	0315	45th/46th and Park	1317.36
GCTWC-105	10/22/2010	0334	44th/45th and Park	330.56
GCT3XVR-18	10/22/2010	0335	50th/51st and Park	229.36
GCTEC-110	10/22/2010	1213	47th/48th and Park	121.88
ES4SL-5	10/23/2010	0206	(Madison Yard) 48th and Park	385.12
GCT3XVR-19	10/23/2010	0338	50th/51st and Park	216.32
GCTWC-106	10/23/2010	0338	48th/49th and Park	579.92
GCTWC-107	10/23/2010	0338	48th/49th and Park	373.12
SC53-1	10/23/2010	0340	53rd and Park	269.94
GCTEC-112	10/25/2010	2045	47th/48th and Park	233.68
SC53-2	10/26/2010	0330	53rd and Park	229.24
GCTWC-108	10/26/2010	0331	44th/45th and Park	125.08
GCT3XVR-20	10/26/2010	0332	50th/51st and Park	220
GCTEC-113	10/26/2010	1217	47th/48th and Park	180.72
GCTEC-114	10/26/2010	2246	47th/48th and Park	212.52
SC53-3	10/27/2010	0333	53rd and Park	487.8
GCTEC-111	10/27/2010	0333	45 th /46 th and Park	1320.96
GCT3XVR-21	10/27/2010	0334	50th/51st and Park	204.32

Blast Number	Date	Actual Time of Blast	Location	Pounds of Explosive
TT1-23	10/27/2010	1212	37th/38th and Park	143.96
GCTEC-115	10/27/2010	2245	47 th /48 th and Park	205.32
ES3SL-14	10/28/2010	0203	(Madison Yard) 47 th and Park	892.72
SC53-4	10/28/2010	0317	53rd and Park	309.64
GCT3XVR-22	10/28/2010	0318	50th/51st and Park	54.76
GCTEC-116	10/28/2010	2244	47 th /48 th and Park)	220.16
GCTEC-117	10/29/2010	0210	47 th /48 th and Park	264.16
GCT3XVR-23	10/29/2010	0302	50th/51st and Park	211.16
GCTEC-119	10/29/2010	0302	45 th /46 th and Park	1319.16
SC53-5	10/29/2010	1115	53rd and Park	416.88
ES4SL-6	10/30/2010	0212	(Madison Yard) 48th and Park	403.96
GCTWC-109	10/30/2010	0258	47 th /48 th and Park	1103.52
38FCW-1	11/1/2010	1330	37th/38th and Park	360.24
38FCE-4	11/1/2010	1454	37th/38th and Park	520.96
GCTEC-118	11/1/2010	2247	47 th /48 th and Park	251.28
GCTEC-120	11/2/2010	0037	47 th /48 th and Park	313.6
GCTEC-121	11/2/2010	0037	47 th /48 th and Park	347.6
GCT3XVR-24	11/2/2010	0333	50th/51st and Park	226.44
GCTEC-122	11/3/2010	0331	46 th /47 th and Park	1015.52
GCT3XVR-25	11/3/2010	0331	50th/51st and Park	30
GCTEC-123	11/3/2010	2245	47 th /48 th and Park	247.92
ES3SL-15	11/4/2010	0205	(Madison Yard) 47 th and Park	1203.8
GCT4XVR-1	11/4/2010	0330	Between 51 st /52 nd and Park	549.12
GCTEC-124	11/4/2010	2245	47 th /48 th and Park	107.36
GCTEC-125	11/4/2010	2245	47 th /48 th and Park	260.64
GCTWC-110	11/5/2010	0306	47 th /48 th and Park	778.8
GCT3XVR-26	11/5/2010	0307	50th/51st and Park	47.64
GCT5FR1-1	11/5/2010	1200	58 th St between Park and Lex	364.08
ES4SL-7	11/6/2010	0203	(Madison Yard) 48th and Park	647.68
ES3SL-16	11/6/2010	0208	(Madison Yard) 47 th and Park	47.92
GCTEC-127	11/6/2010	0346	46 th /47 th and Park	953.04
GCT3XVR-27	11/6/2010	0346	50th/51st and Park	54.2
38FCE-5	11/8/2010	1407	37th/38th and Park	638.04
GCTEC-126	11/8/2010	2249	47 th /48 th and Park	529
GCTEC-128	11/8/2010	2249	47 th /48 th and Park	324.12
GCT3XVR-28	11/9/2010	0332	50th/51st and Park	234.12
38FCW-2	11/9/2010	1228	37th/38th and Park	439.2
GCT5FR1-2	11/9/2010	2320	58 th St between Park and Lex	307
GCTEC-129	11/10/2010	0346	47 th /48 th and Park	324.6
GCTEC-130	11/10/2010	0346	47 th /48 th and Park	350.76
GCT5FR1-3	11/10/2010	2246	58 th St between Park and Lex)	334.92
ES4SL-8	11/11/2010	0205	(Madison Yard) 48th and Park	476.72
GCTEC-132	11/11/2010	0330	47 th /48 th and Park	270.48
GCT3XVR-29	11/11/2010	0330	50th/51st and Park	237.72
38FCE-6	11/11/2010	1246	37th/38th and Park	550.68
GCT5FR1-4	11/11/2010	2115	58 th St between Park and Lex	200.84
GCTEC-134	11/11/2010	2244	46 th /47 th and Park	1398.32
ES3SL-17	11/12/2010	0222	(Madison Yard) 47 th and Park	1637.68
GCTEC-133	11/12/2010	0331	47 th /48 th and Park	232.68
GCT3XVR-30	11/12/2010	0331	50th/51st and Park	25.48
38FCW-3	11/12/2010	1131	37th/38th and Park	626.56
GCTEC-135	11/12/2010	2246	46 th /47 th and Park	1635
SFT4-27	11/13/2010	0205	Between 48 th /49 th and Park	89
GCT3XVR-31	11/13/2010	0332	50th/51st and Park	187

Note: Highlighted blasts indicate when one or more 40 Park Avenue residents submitted an odor complaint.

Blasts with locations identified with Madison Yard are not connected to the ventilation system at 37th and Park.