DRAFT

FYN PAINT & LACQUER CO., INC.
230 KENT AVENUE
BROOKLYN, KINGS COUNTY, NEW YORK

REMEDIAL ACTION WORK PLAN
NYS VCP SITE ID #V00380-2

Prepared For

Fyn Paint & Lacquer Co., Inc.

October 2008

Prepared By:

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CERTIFICATIONS

I, William Beckman, am currently a registered professional engineer licensed by the State of New York. I have primary direct responsibility for oversight of the implementation of the remedial program for the Fyn Paint & Lacquer Co., Inc. Site listed as New York State Department of Environmental Conservation NYSDEC Voluntary Cleanup Agreement (VCA) Site ID #V00380-2.

I certify that the Site description presented in this Remedial Action Work Plan (RAWP) is identical to the Site descriptions presented in the VCA for the Fyn Paint & Lacquer Co., Inc. Site and related amendments.

I certify that this plan includes proposed use restrictions, Institutional Controls, Engineering Controls, and plans for all operation and maintenance requirements applicable to the Site and provision for development of an Environmental Easement to be created and recorded pursuant to ECL 71-3605. This RAWP requires that all affected local governments, as defined in ECL 71-3603, will be notified that such Easement has been recorded. This RAWP requires that a Site Management Plan must be submitted by the Volunteer for the continual and proper operation, maintenance and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, for approval by the Department.

I certify that this RAWP has a plan for transport and disposal of all soil, fill, fluids and other material removed from the property under this Plan, and that all transport and disposal will be performed in accordance with all local, State and Federal laws and requirements. All exported material will be taken to facilities licensed to accept this material in full compliance with all Federal, State and local laws.

I certify that this RAWP has a plan for import of all soils and other material from off-Site and that all activities of this type will be in accordance with all local, State and Federal laws and requirements.

I certify that this RAWP has a plan for nuisance control during the remediation and all invasive development work, including a dust, odor and vector suppression plan and that such plan is sufficient to control dust, odors and vectors and will prevent nuisances from occurring.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

NYS Professional Engineer #	Date	Signature

Note: include PE stamp

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

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ACRONYMS AND ABBREVIATIONS

AGV	-	Alternative Guidance Values
AMRO	-	AMRO Environmental Laboratories Corporation
AS	-	Air Sparge
SAP	-	Analytical Services Protocol
CAMP	-	Community Air Monitoring Plan
C/D	-	Construction and Demolition
CEQR	-	City Environmental Quality Review
CERCLA	-	Environmental Response, Compensation, and Liability Act
CFR	-	Code of Federal Regulations
COC	-	Certificate of Completion
Con Ed	-	Consolidated Edison, Inc. (And Subsidiary Consolidated Edison Company of New York)
Con Edison	-	Consolidated Edison, Inc. (And Subsidiary Consolidated Edison Company of New York)
CPP	-	Citizen Participation Plan
CQAP	-	Construction Quality Assurance Plan
DAR	-	Division of Air Resources
DER-10	-	Division of Environmental Remediation – 10 (Technical Guidance for Site Investigation and Remediation)
DNAPL	-	Dense Non-Aqueous Phase Liquid
DO	-	Dissolved Oxygen
DSHM	-	Division of Solid and Hazardous Materials (NYSDEC Division)
EC	-	Engineering Controls
ECL	-	Environmental Conservation Law
EDR	-	Environmental Data Resources, Inc.
ELAP	-	Environmental Laboratory Accreditation Program
ERP	-	Emissions Rate Potential
EPA	-	United States Environmental Protection Agency
ESA	-	Environmental Site Audit
FER	-	Final Engineering Report
ft^2	-	Square Feet
ft bg	-	Feet Below Grade
ft/ft	-	Foot per Foot
Fyn	-	Fyn Paint & Lacquer Co., Inc.
GC-FID	-	Gas Chromatography Flame Ionization Detection
GPM	-	Gallons Per Minute
GWQS	-	Groundwater Quality Standards
HASP	-	Health and Safety Plan
HAZWOPER	-	Hazardous Waste Operations and Emergency Response
IC	-	Institutional Controls
IRM	-	Interim Remedial Measures
LBG	-	Leggette, Brashears & Graham, Inc.

ACRONYMS AND ABBREVIATIONS
(continued)

Lb/hour	-	Pound per Hour
LMS	-	Lawler, Matusky & Skelly Engineers, LLP
LNAPL	-	Light Non-Aqueous Phase Liquid
mg/kg	-	milligrams per kilogram
mg/l	-	milligrams per liter
ml/minute	-	Milliliter per Minute
NAPL	-	Non-Aqueous Phase Liquid
NFST	-	North First Street Terminal
NYC DEP	-	New York City Department of Environmental Protection
NYC DOB	-	New York City Department of Buildings
NYCRR	-	New York Codes, Rules and Regulations
NYS DEC	-	New York State Department of Environmental Conservation
NYS DOH	-	New York State Department of Health
NYS DOT	-	New York State Department of Transportation
OEC	-	Office of Environmental Coordination
ORP	-	Oxygen Reduction Potential
OSHA	-	Occupational Safety and Health Administration
PCBs	-	Polychlorinated Biphenyls
PCE	-	Tetrachloroethene/Tetrachlorothylene/Pechloroethylene
PDF	-	Portable Document Format
PID	-	Photoionization Detector
ppb	-	Parts per Billion
PPBV	-	Parts per Billion Volume
ppm	-	Parts per Million
PVC	-	Polyvinyl Chloride
QA	-	Quality Assurance
QA/QC	-	Quality Assurance and Quality Control
QAPP	-	Quality Assurance Project Plan
QC	-	Quality Control
RA	-	Remedial Action
RAO	-	Remedial Action Objectives
RAWP	-	Remedial Action Work Plan
RCRA	-	Resource Conservation and Recovery Act
RI	-	Remedial Investigation
RIR	-	Remedial Investigation Report
Sanborn	-	Sanborn Fire Insurance Map
SCG	-	Standards, Criteria, and Guidance
SCO	-	Soil Cleanup Objective
SEQRA	-	State Environmental Quality Review Act
SMP	-	Site Management Plan
SoMP	-	Soil/Materials Management Plan

ACRONYMS AND ABBREVIATIONS
(continued)

SOP	-	Contractors Site Operations Plan
SPDES	-	State Pollutant Discharge Elimination System
SRI	-	Supplemental Remedial Investigation
SSDS	-	Sub-Slab Depressurization System
STARS	-	Spill Technology and Remediation Series
SVE	-	Soil Vapor Extraction
SVI	-	Soil Vapor Intrusion
SVOC	-	Semivolatile Organic Compound
SWPPP	-	Storm-Water Pollution Prevention Plan
TAGM	-	Technical and Administrative Guidance Memorandum
TAL	-	Target Analyte List
TCL	-	Target Compound List
TOGS	-	Technical and Operational Guidance Series
Toxikon	-	Toxikon Corporation
1,1,1-TCA	-	1,1,1-Trichloroethane
TCE	-	Trichloroethene/Trichloroethylene
ug/kg	-	Micrograms Per Kilogram
ug/l	-	Micrograms Per Liter
ug/m^3	-	Micrograms Per Cubic Meter
US EPA	-	United States Environmental Protection Agency
UST	-	Underground Storage Tank
VCA	-	Voluntary Cleanup Agreement
VCP	-	Voluntary Cleanup Plan
VOC	-	Volatile Organic Compound

FYN PAINT & LACQUER CO., INC.
230 KENT AVENUE
BROOKLYN, KINGS COUNTY, NEW YORK

REMEDIAL ACTION WORK PLAN
NYS VCP SITE ID #V00380-2

EXECUTIVE SUMMARY

The Fyn Paint & Lacquer Co., Inc. (Fyn) is the subject of a Voluntary Cleanup Program (VCP), Index Number W2-0873-00-10 pursuant to the New York State Department of Environmental Conservation (NYSDEC) VCP. Fyn has entered into the VCP with the NYSDEC and is listed as the volunteer for Site ID V00380-2, Index No. W2-0973-00-10. Leggette, Brashears & Graham, Inc. (LBG) on behalf of Fyn, has prepared the following Remedial Action Work Plan (RAWP). Fyn is located at 230 Kent Avenue in Brooklyn, New York (heretofore referred to as the 'Site').

The Site is located in an area of Brooklyn (Williamsburg) which is predominantly industrial and commercial with lesser amounts of residential properties throughout. The Site is located at the intersection of Kent Avenue and North First Street and consists of a one story industrial/warehouse building. The Site is currently an active paint and lacquer manufacturing facility, as has been the case since at least 1951. The Site is an active RCRA facility, and a large quantity generator of hazardous waste (EPA ID #001270867). A site map is presented as Figure 1.

Summary of Remedial Investigations

Based on the historical environmental investigations performed at the Site and surrounding properties by Con Ed (via its representatives) and representatives for Fyn Paint (Fenley & Nicol Environmental and LBG), the contamination beneath the Site consists of:

1. Non-Aqueous Phase Liquid (NAPL)

   The historical observations have identified NAPL (primarily consisting of acetone, toluene and xylene) as primarily being localized to the northeast corner of the Fyn

Paint factory as well as within the adjacent Con Edison facility parking lot. Historical observations of NAPL have also been observed to the south of the Site in a groundwater monitoring well (MW-9A), although at lower quantities than the on-Site wells.

2. Soil Contamination

Soil contamination consisting of toluene and xylenes was detected at its highest concentrations (during the installation of soil borings and groundwater monitoring wells) in the northeast corner of the Fyn Paint factory as well as within the Con Ed parking lot with lesser amounts of contamination in the soil to the southwest. Additionally, toluene and xylene were detected in soil collected from upgradient of the Site (to the southeast). Based on the soil contamination distribution, one source is the underground storage tank (UST) area in the northeast corner of the Fyn Paint factory.

3. Groundwater Contamination

The dissolved phase volatile organic compounds (VOCs) in groundwater beneath the Site correlates with the distribution of VOC contamination recorded in soil samples collected throughout the Site. The highest concentrations of VOCs detected in the groundwater are located beneath the Site and off-Site on adjacent Con Ed property (north), extending downgradient to the west. Groundwater analyzed from points outside of the block encompassing the Site are on average several orders of magnitude lower than those beneath the Site.

4. Soil Vapor Contamination

The types and relative concentrations of VOCs detected in soil vapor samples collected from beneath the Site and surrounding properties correlate with the distribution of the soil and groundwater VOC contamination. Additionally, there are additional compounds of concern detected in the soil vapor both on-Site and surrounding the Site (namely chlorinated solvents) which do not correlate with the soil and/or groundwater contamination observed as part of the environmental investigations.

Qualitative Human Health Exposure Assessment

The contamination beneath the Site is the result of historical activities on the Site, as well as possible contributions from off-Site sources. The workplace activities at the Site include the manufacture, formulation, and/or commercial use of the contaminants and Site workers are involved in directly handling the contaminants. As such, there is a direct exposure pathway for Site workers via ingestion, inhalation or dermal contact. Additionally, a possible exposure route is through soil vapor intrusion. The possible contamination exposure at the surrounding properties is considered to be by way of an exposure which is the result of a contaminant finding its way from the subsurface into food, water or air supplies. The physical location of the contamination is in the subsurface. The surrounding area is completely paved and covered with buildings. As such, the likelihood of humans being exposed through ingestion and/or dermal contact is minimal. The likelihood of human exposure to soil vapor contamination on adjacent residential and commercial properties is unclear, since only a partial SVI investigation has been able to be completed (due to access restrictions). Of note, based on the SVI sampling performed, the likelihood of human exposure to soil vapor contamination on adjacent residential and commercial properties is low.

Summary of the Remedy

This RAWP was developed based on the results of the historical investigations performed at the Site and on the adjacent Con Ed property (1996-2001); the NYSDEC-approved September 2003 SRI Report; Supplemental Remedial Investigation Work Plan (Addendum I); Remedial Investigation activities performed in 2005 consisting of a soil vapor survey, groundwater monitoring and aquifer testing; Remedial Investigation activities conducted in 2006 and 2007; and the Interim Remedial Measures (IRM) consisting of groundwater extraction and treatment and NAPL removal, which were implemented in 2007. The Remedial Investigation Report (RIR) was submitted to NYSDEC on January 31, 2008.

The remedial goals of the proposed RAWP are:

- remediate the soil beneath the Site by removing the suspected VOCs source materials (USTs and contaminated soil);

- remove NAPL from the subsurface to eliminate the source of dissolved phase contamination;
- reduce concentrations of dissolved phase contamination in the groundwater on-Site and off-Site (downgradient) to background levels;
- prevent lateral and vertical migration of dissolved phase contamination from the Site;
- prevent off-Site migration of contaminated groundwater and soil vapor.

In order to achieve these goals, the following Remedial Action activities are proposed to be implemented at the Site. Several Engineering Controls and Institutional Controls will be maintained until the goals of each element of the Remedial Action is achieved at the Site.

1. Removal of Abandoned USTs and Residual VOC Source Material

In order to address and eliminate the potential VOCs source the abandoned USTs located inside of the Fyn Paint building will be excavated and removed. The removal will be conducted only if the structural integrity of the building foundation can be maintained. During the removal of USTs from inside of the Fyn Paint building, all accessible contaminated soil will also be excavated and disposed off-Site. Additionally, it is recommended that the UST located on the adjacent Con Ed parking lot (owned by Con Ed) be removed during the implementation of Remedial Action Plan to facilitate performance of the other Engineering Controls (i.e., air sparging/soil vapor extraction systems).

2. Air Sparging and Soil Vapor Extraction

The remediation of on-Site and off-Site groundwater, soil and soil vapor will be accomplished by a combination of Air Sparging (AS) and Soil Vapor Extraction (SVE) technologies. In addition to actively remediating the soil, groundwater and soil vapor beneath the Site, this remedial action will also act an Engineering Control to prevent potential soil vapor intrusion in on-Site and off-Site buildings.

3. Groundwater Extraction and Treatment

Groundwater remediation at the Site will continue using the existing IRM pump and treat system, which consists of one extraction well (EW-1) and an air operated pump. The groundwater from the extraction well will continue to be treated using an air stripper and 2 carbon cells. The groundwater quality data obtained between 2001 and 2007 showed a general decrease of contaminant concentration in groundwater beneath the Fyn Paint Site, the adjacent Con Edison property and other off-Site areas. The groundwater pump and treat system will also prevent off-Site migration of contaminated groundwater. A second extraction well (EW-2 installed to the west of the Site on River Street) may be used for groundwater remediation if necessary).

4. NAPL Recovery

The NAPL recovery system at the Site will continue using the existing IRM system, which consists of 2 wells and air operated pumps. Monitoring performed at the Site since 2001 shows a limited on-Site NAPL plume.

5. Sub-Slab Depressurization System (SSDS)

The SSDS will be installed and operated to remove contaminated soil vapor from beneath the on-Site building as well as to prevent the build-up of soil vapor beneath the building slab. The removal of soil vapor with elevated VOC concentration will mitigate soil vapor intrusion within the on-Site building, and will help to prevent off-Site migration of soil vapor.

6. Composite Cover

A composite cover systems, consisting of soil cover on open areas, asphalt or concrete pavement on walkways, roads and parking lots, and concrete building slabs will prevent exposure to contaminated soils. Slabs and paving systems (buildings, roadways, parking lots, etc.) will be at least 6 inches thick.

7. In-Situ Chemical Oxidation

As part of the approach to address the dissolved phase VOC contamination, chemically enhanced remediation of groundwater will be utilized. In-situ chemical oxidation is a remedial approach that works by breaking down dissolved phase VOCs.

This technology will be utilized at the source area (the on-site UST excavation) once NAPL recovery has been completed as well as off-Site to remediate the dissolved phase contamination.

8. Groundwater Monitoring

The current quarterly groundwater monitoring program will continue to be performed at the Site and surrounding areas. This will allow continual evaluation of the progress of the remedial actions at the Site. Periodic monitoring will continue until the remedial goals for the Site are achieved.

9. Recording of an Environmental Easement

Following completion of the Remedial Action activities, an Environmental Easement will be recorded for the Site with the Queens County Clerk's office. This document will act as an Institutional Control to ensure continued operation of the Engineering Controls, and to prevent future exposure to any residual contamination remaining at the Site by establishing protocols limiting the potential for human exposure.

10. Implementation of a Site Management Plan

A Site Management Plan (SMP) will be developed for long-term management of residual contamination. The Site Management activities will be implemented following completion of the Remedial Action activities. Site Management is the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. Site Management continues in perpetuity or until released in writing by NYSDEC. The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the VCA with the NYSDEC.

REMEDIAL ACTION WORK PLAN

1.0 INTRODUCTION

Fyn Paint & Lacquer Co., Inc. entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC) in April 1, 2001, to investigate and remediate a 5,862 square foot (0.135-acre) property located at 230 Kent Avenue in Williamsburg, Brooklyn, Kings County, New York. Fyn Paint & Lacquer Co., Inc. (Fyn) is a Volunteer in the Voluntary Cleanup Program (VCP). The Site is currently utilized for manufacturing purposes with commercial and residential development occurring in the surrounding area. The Site is an active RCRA facility, and is also a Large Quantity Generator of hazardous waste (EPA ID # 001270867). Pending Site remediation and RCRA Facility Closure activities, commercial and/or industrial usage is proposed for the Site.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), and Supplemental Remedial Investigations performed on the Site and surrounding properties between 1996 and 2007. It provides an evaluation of applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does pose a significant threat to human health and the environment. The RI for this site did not identify fish and wildlife resources.

A formal Remedial Design document will be prepared. The 60% Remedial Design will be submitted within 45 days of NYSDEC and NYSDOH approval of the RAWP.

1.1 SITE LOCATION AND DESCRIPTION

The Fyn Paint & Lacquer Co., Inc. site (the Site) is located in the Borough of Brooklyn, New York City. The Site consists of a partial two-story industrial/warehouse building

situated on the block bounded by Kent Avenue to the east, Metropolitan Avenue to the north, North First Street to the south and River Street to the west. The Metes and Bounds are presented in Appendix A.

The Site is currently utilized as a paint and lacquer factory. The vicinity of the property consists of industrial, commercial and residential properties. The two properties contaminated with VOCs are Fyn Paint located at 230 Kent Avenue and Con Edison located at 214 Kent Avenue. A site map is shown on Figure 1.

The footprint of the building is approximately 5,862 ft^2 (square feet). The building's heat is provided by steam and the electrical service enters the building from Kent Avenue. A small basement is used for the heating oil tank, furnace and controls for the sprinkler system and air compressor. The Site is connected to the New York City municipal sewer system.

1.2 CONTEMPLATED REDEVELOPMENT PLAN

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment. This will be consistent with the contemplated end use as a commercial/industrial facility. However, the Remedial Action as proposed under this RAWP may be expanded/modified in the future should the property end use be changed.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is located in an industrial/commercial area with some residential properties (currently expanding residential development). The buildings adjacent to the Site consist of mixed use residential/commercial/industrial buildings, the Long Island Power Authority substation to the southwest, and a residential condominium currently under construction to the east. Additionally, the East River is located approximately 300 feet west of the Site. There were no schools, day care facilities or hospitals observed in the immediate vicinity of the Site.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

This RAWP was developed based on the results of the historical investigations performed at the Site and the Con Ed property (1996-2001); the NYSDEC-approved September

2003 SRI Report; Supplemental Remedial Investigation Work Plan (Addendum I); Remedial Investigation activities performed in 2005 consisting of a soil vapor survey, groundwater monitoring and aquifer testing; Remedial Investigation activities conducted in 2006 and 2007; and, Interim Remedial Measures (IRM) which started in 2007. These investigations were conducted from May 2001 to the present. The results of the investigations were presented in the Remedial Investigation Report (RIR), which was submitted to the NYSDEC in January 2008.

The following sections summarize the remedial investigations performed at the Site.

2.1 SITE HISTORY

2.1.1 *Past Uses and Ownership*

A review of historical sources confirmed that the Site has historically been used for industrial and commercial purposes consisting of: lumber storage; steel storage; and paint and lacquer manufacturing from at least 1951.

2.1.2 *Sanborn Fire Insurance Maps*

Historical Sanborn fire insurance maps were reviewed to determine past uses of the Site and surrounding properties. The review of Sanborn maps indicated that the Site and the surrounding area has been heavily utilized for industrial and commercial activities for more than 100 years. A detailed evaluation of the historical Sanborn fire insurance maps is presented in Section 2.5.2.1.

2.2 GEOLOGICAL CONDITIONS

Based on the remedial investigation activities performed at the Site, the geologic conditions at the Site have been comprehensively characterized. Geologic logs are presented in Appendix B. The ground surface at the Site consists of concrete and asphalt pavement. The shallow sediments beneath the Site consist of medium and coarse grained brown sand with some silt and trace gravel. The depth to groundwater is approximately 12 ft bg (feet below grade) to 15 ft bg. In general, the subsurface beneath the area consisted of interbedded layers of sand, gravel, clay and silt to approximately 75 feet below ground surface. Bedrock beneath the Site

was not encountered but it is expected to be below 75 feet. Geological cross-sections are included in Appendix B. The regional groundwater flow direction groundwater beneath the property is toward the west. Based on the results of investigations performed at the Site, the baseline regional hydraulic gradient at the Site is approximately 0.05 foot per foot to the west (toward the East River). Tables summarizing the historical groundwater elevations recorded during the groundwater monitoring rounds are included in Appendix C. Historical groundwater elevation contour maps generated from data obtained during groundwater monitoring rounds are included in Appendix C.

Based on data collected during the groundwater pumping test, the hydraulic conductivity in the subsurface at the Site is 2.7 feet/day. The pumping test data for EW-1, MW-21 and MW-24 (presented in tabular form) as well as the hydraulic conductivity calculations from the pumping test are included in Appendix D. The groundwater velocity using an effective porosity of 25% and a hydraulic gradient of 0.025 is approximately 0.10 foot/day.

2.3 CONTAMINATION CONDITIONS

Based on the historical environmental investigations performed on-Site and off-Site, the primary contaminants of concern consist of NAPL (acetone, toluene and xylene), residual VOCs in subsurface soils, dissolved phase VOCs in groundwater and VOCs in soil vapor. Tables summarizing soil quality data is included in Appendix E.

2.3.1 *Conceptual Model of Site Contamination*

- The on-Site contamination consists of limited NAPL, residual VOC in subsurface soils (Appendix E), dissolved phase VOC in groundwater (Appendix F) and VOC in soil vapors (Appendix G).
- The off-Site contamination consists of dissolved phase VOCs in groundwater and VOCs in soil vapor.

2.3.2 *Description of Areas of Concern*

The Primary areas of concern at the Site include:

- USTs located in the northeast corner of the Site building;
- localized NAPL located groundwater in the northeast corner of the Site and beneath the adjacent Con Edison parking lot; and,
- dissolved phase VOC contamination on-Site and off-Site to the west and south.
- associated soil and fill material.

A more detailed description of the distribution and extent of the contamination in each media is provided in Sections 2.4 to 2.7.

2.4 CON EDISON PROPERTY (214 KENT AVENUE) SUMMARY OF REMEDIAL INVESTIGATIONS

Information provided by Con Edison indicated that in 1996, product containing VOCs was encountered in soil borings advanced for the cathodic protection installation associated with the Con Edison 10,000-gallon UST, which had historically been used to store No. 6 fuel oil. The VOCs detected in soil included toluene, ethylbenzene and xylenes totaling 876,000 mg/l (milligrams per liter). NYSDEC Spill Number 96-04977 was assigned to Con Edison Fuel Depot in association with the contamination identified adjacent to the UST. The potential spiller was named as the adjacent paint factory by the Con Edison representative who reported the spill. The material spill reported was PCB oil, lead and toluene observed in soil samples. The NYSDEC spill report is in Appendix H. The 10,000-gallon UST was abandoned in place by Con Edison. No information is available regarding the UST abandonment procedure.

A Phase II Environmental Site Assessment (ESA), performed for Con Edison by Lawler, Matusky & Skelly Engineers, LLP (LMS), was completed on January 14, 2000. This investigation covered the North First Street Terminal (NFST) and the former Pfizer property located to the south of Con Edison. Presently, the former Pfizer site is owned by the New York State Power Authority (see Figure 1).

In addition to the soil borings, groundwater samples were collected from four monitoring wells (MW-1, MW-2, MW-3 and MW-4). One monitoring well (MW-4) contained VOCs in concentrations exceeding the NYSDEC Class GA standards. Groundwater samples col-

lected from the monitoring wells were generally consistent with the soil samples collected from the same location.

The primary recommendation by LMS was to further delineate the contamination on Con Edison property. LMS also proposed several conceptual remediation alternatives for the Con Edison property, including no action/natural attenuation, "hot spot" soil excavation, and an air sparging/soil-vapor extraction/vapor treatment system.

2.5 FYN PAINT PROPERTY (230 KENT AVENUE) SUMMARY OF REMEDIAL INVESTIGATIONS

The Fyn Paint & Lacquer Co., Inc. Site is a facility which produces paints and lacquers. This facility is a NYSDEC registered Chemical Bulk Facility (ID #2-000151), and is an active RCRA facility and Large Quantity Generator of hazardous waste (EPA ID # 001270867).

2.5.1 *Fyn Paint UST Closure Activities (Fenley & Nicol)*

In January 1999 on behalf of Fyn, Fenley & Nicol Environmental performed the closure of three (3) steel 550-gallon USTs; four (4) steel 1,100-gallon USTs; and one (1) steel 1,500-gallon UST at the Site. The tanks had been historically used to store acetone, toluene and xylene. The locations of the abandoned Site USTs are shown on Figure 2.

In February 1999, following the tank abandonment, eight (8) soil borings (B-1 to B-8) were drilled inside of the Site building. Selected soil samples were analyzed in the laboratory. The laboratory analysis indicated the presence of ethylbenzene, toluene, o-xylene, m/p xylene and acetone. A UST closure report was prepared by Fenley & Nicol Environmental on March 23, 1999 and was submitted to the NYSDEC. Based on the soil analytical results, NYSDEC assigned spill #9815508 to the Site.

In November and December 2000, Fenley & Nicol Environmental conducted a limited subsurface investigation in order to determine the groundwater quality beneath the Site. Three temporary groundwater sampling wells (TW-1, TW-2 and TW-3) were installed in the vicinity of the former USTs. The locations of these temporary groundwater sampling wells are shown

on Figure 2. Laboratory analysis of the groundwater samples collected from TW-1, TW-2 and TW-3 identified several VOCs at elevated concentrations (primarily acetone, xylene, toluene, ethylbenzene, 2-butanone and methylene chloride). The highest concentrations of VOCs detected were acetone (10,558,250 ug/l in TW-3), xylene (452,653 ug/l in TW-3), toluene (241,037 ug/l in TW-1), ethylbenzene (74,258 ug/l in TW-3), 2-butanone (35,826 ug/l in TW-2) and methylene chloride (7,784 ug/l in TW-1).

2.5.2 *LBG Environmental Investigation Activities*

In April 2001, LBG was retained by Fyn Paint & Lacquer Co., Inc. to perform a subsurface investigation and subsequent data evaluation of contamination conditions related to the Fyn Paint Site and adjacent Con Edison site. The purpose of this work was to better define the direction of groundwater flow in the area; obtain additional data regarding the quality of soil and groundwater beneath the area; evaluate potential contributors to the subsurface contamination in the area; evaluate the proposed remediation cost estimate prepared by Con Edison; and prepare a conceptual remedial plan.

Following completion of the initial environmental investigation activities performed by LBG, it was determined that a more comprehensive investigation would be required to fully delineate and characterize the contamination both on-Site and off-Site, as well as to develop an appropriate remedial action to address said contamination. Summaries of the investigations and remedial actions performed by LBG are presented below and the summary tables are included in Appendix E (soil), Appendix F (groundwater) and Appendix G (indoor air/soil vapor).

2.5.2.1 Surrounding Properties History

To develop a more complete historical profile of the Site, LBG requested a search of fire insurance maps from EDR's Sanborn map database. Sanborn maps, originally created to aid insurance underwriters in assessing the potential for fire risk, also contain information on a structure's use and the location of any fuel and chemical storage areas on a site.

A search of the fire insurance maps consisted of reviewing maps for the Site for the years 1887, 1904, 1905, 1916, 1918, 1935, 1941, 1942, 1950, 1951, 1965, 1980, 1986, 1991 and 1996. The Sanborn maps for the above-referenced years are included in Appendix I.

1887 The Site is listed as being occupied by Hardy Vorhees & Co. Lumber Yard. The main roads surrounding the Site (Kent Avenue, North First Street, River Street and Metropolitan Avenue) are the same as those that exist currently. The property adjacent to the north is occupied by C.W. Wilson Lumber Yard. The block to the west of the Site is also owned by Hardy Vorhees & Co. (lumber yard) and C.W. Wilson (lumber yard). Surrounding properties to the north, east and south are primarily stores and residential dwellings. Additional properties of note are listed as follows: several machine shops to the north; an iron foundry to the east; and, two factories to the south. The majority of the area surrounding the Site appears to be undeveloped.

1904 The Site is used for steel storage. The owner of the Site is not listed, however; the Con Edison property (adjacent to the north) is listed as being occupied by M. Samuel and Sons Metals. Adjacent to the west is the M.M. Miller Agent Coal Pocket and Storage Yard. Surrounding properties to the north include the American Coffee Co. (2 large gasoline tanks shown) and the American Sugar Refining Co. Adjacent to the south is the T.M. Duche & Sons Licorice Mfg. Further to the South is the American Sugar Refining Co. Brooklyn Plant (numerous storage tanks of unknown contents). The properties to the east are not presented for this year.

1905 This map presents properties to the east of the Site (not included on the 1904 maps). Properties adjacent to the east of the site are primarily stores and residential dwellings. Additionally, adjacent to the east of the Site are Coal Sheds. Surrounding properties of note to the east include: stores and residential dwellings; a fur company; a copper smith; a lumber shed and brewing companies.

1916 The Site is shown as being occupied by Thos W. Kiley Co. and used for steel storage. The property adjacent to the north is still occupied by M. Samuel and Sons Metals. The adjacent property to the west is now shown as being vacant. Surrounding properties to the north and east remain mostly unchanged from the 1904 maps. Adjacent properties to the east remain stores, residential dwellings and the E.H. Meyers Coal Yards. Adjacent and surrounding properties to the south are not provided for this year.

1918 The Site is not shown on this Sanborn Map. This map shows properties to the south of the Site. No information is given for the property adjacent to the south which appears to be vacant. Surrounding properties of note are listed as follows: American Sugar Refining Co. Brooklyn Plant, the U.S. Government Shipping Board, a laundry company and several iron and steel storage/manufacturing facilities.

1935 The Site is not shown on this Sanborn Map. This map shows properties to the south of the Site. The occupant of the property adjacent to the south is illegible on this map. Surrounding properties to the south include: Seaman Trucking Co., a laundry company, the American Sugar Refining Co. and several iron and steel storage/manufacturing facilities. Of note, the majority of the properties presented on this map are illegible due to poor map quality.

1941 The Site is still occupied/owned by the Thos W. Kiley Co. The property adjacent to the north is still occupied by M. Samuel and Sons Metals. The property adjacent to the west of the Site is occupied by the Great American Fuel Corporation which has several tanks and coal bins. Surrounding properties to the north include the Sweet Life Food Corp. (which has a filling station on the block north of the Site), the American Sugar Refining Co. (which has a chemical storage area), and Austin Nichols & Co Whol Groccers/Clark Chapin Bushnell Inc. (details illegible).

1942 The Site is not shown on this Sanborn Map. This map shows properties to the east of the Site. Properties adjacent to the east of the Site are primarily iron storage yards. Surrounding properties to the east include: a vinegar manufacturing facility, the Old Dutch Mustard Co., several wire storage warehouses, a filling station (on Wythe), a lumber shed and miscellaneous commercial/industrial operations.

1950 The Site is not shown on this Sanborn Map. This map shows properties to the south of the Site. The occupant of the property adjacent to the south is not listed, however it is listed as having been built in 1920. On the same block there is a boiler room as well as bottling facility. To the southwest, the property is occupied by Charles Pfizer Co., Inc. and there are several tanks (a 2,000,000 gallon and a 3,000,000 gallon molasses tank, and a 100,000 gallon Sulphur tank). To the southeast there is a Lacquer Storage facility (Grand and Kent), several waste paper and rag facilities, a metal stamping facility, a painting and auto refinishing facility, an electro-plating facility, a shellac mixing facility, a laundry facility and a filling station and the American Sugar Refining Co. properties.

1951 The Site is now listed as Paint and Lacquer Manufacturing. The property adjacent to the north is still occupied by M. Samuel and Sons Metals. The adjacent property to the west shows no occupant with the exception of four tanks (contents not listed) and Coal Pockets. Properties to the north are occupied by the Brooklyn Terminal Stores, Inc. (gasoline tanks), a valve and pipe warehouse, and a filling station (tanks). Further to the north are the Lehigh Warehouse and Transportation Co, Inc and several rail yards. Properties to the east include a broom manufacturing facility, steel storage yards, a pipe shop, the Old Dutch Mustard Co. (and associated vinegar manufacturing), a 10,000 gallon tank of unknown contents, various hardware and wire storage facilities, a bottling warehouse, a filling station, the Imperial Plating Co., an auto parts re-building facility and several garages with gasoline tanks.

1965 These maps show the Site and the adjacent property to the north as they are today, however the occupant of the property adjacent to the north is the NEPCO Terminal Corp. (which contains a machine/boiler room and a foam tank room). The properties to the west and northwest are owned by the NEPCO Terminal Corp. and are improved with several Bunker Fuel Oil #6 storage tanks ranging from 2,325,000 gallons to 6,000,000 gallons in capacity. Further to the north are several rail yards. The properties to the east include a private garage and plastics storage facility (adjacent) as well as other storage yards, a gas tank in a private parking lot (75 Metropolitan Avenue), the Old Dutch Mustard Co. (and associated vinegar manufacturing), a 10,000 gallon tank (sprinkler tank), a filling station/auto repair facility and the Imperial Plating Co. Properties to the south and southwest are the same as in 1950 Sanborn (including the Charles Pfizer Co., Inc. property, the lacquer storage building, filling station, garages, electroplating and metal stamping).

1980 These maps shows no apparent changes from the 1986 Sanborn map for the Site or the properties to the north, south and west of the Site. Properties to the east appear unchanged from the 1965 map with the exception that there is several steel storage tanks located at 57 North 1st Street.

1986 These maps show no significant changes from the 1980 Sanborn maps.

1991 These maps show no significant changes from the 1986 Sanborn maps.

1996 These maps show no significant changes from the 1991 Sanborn maps with the exception that there are additional tanks (unknown contents due to poor map reproduction quality) at the Old Dutch Mustard Co. property.

Several noticeable areas of concern are evident from the Sanborn maps. The Site has historically been used for lumber storage, steel storage and from at least 1951 for Paint and Lacquer Manufacturing.

In addition to the past occupants at the Site, there have also been several occupants on adjacent and surrounding properties, which have potentially negatively impacted the environmental status of the Site. These include but are not limited to Major Oil Storage Facilities (MOSFs), numerous machine shops, the Old Dutch Mustard Co. facility, the Imperial Plating Co., the Charles Pfizer Co., Inc. property, a lacquer storage building, several properties with listed gasoline tanks, metal manufacturing facilities, a fur company, a laundry company, an iron foundry, filling stations, a metal stamping facility, a painting and auto refinishing facility, an electro-plating facility, a shellac mixing facility as well as numerous properties with no listed owner/occupant descriptions. This review of available historical Sanborn Fire Insurance Maps shows that the entire area within the immediate vicinity of the Site has a history of substantial industrial/commercial activity capable of having negatively impacted the subsurface (soil, soil vapor and/or groundwater) surrounding and beneath the Site. Properties upgradient (east) of the Site should be investigated as potential contributors to subsurface contamination.

2.5.2.2 2001 Subsurface Investigation

In 2001, LBG conducted a subsurface investigation at the Site and the adjacent areas including the adjacent Con Edison North First Street Facility. The purpose of the investigation was to evaluate the soil and groundwater quality beneath the Site and Con Edison facility, and the areas surrounding these two facilities.

During the 2001 subsurface investigation by LBG, eight (8) soil borings were drilled using the Geoprobe drilling technique (GP-1, GP-2, GP-3, GP-4, CE-1, CE-2, CE-3 and CE-4). Soil samples were collected continuously using a 4-foot macrocore sampling device. Each soil sample was recorded on a geologic log and screened with a photoionization detector (PID). The sample showing the highest PID concentration from each boring location was analyzed in laboratory by Environmental Protection Agency (EPA) Method 8260 and 8270. The soil samples were split with LMS, the consultant for Con Edison. A summary table showing

laboratory analysis of soil samples is included in Appendix E. After the drilling of each soil boring, a microwell was installed at the location of GP-1, GP-2, GP-3, CE-1, CE-2, CE-3 and CE-4. Boring GP-4 was not completed as a microwell because no water was encountered during drilling. Each microwell is constructed with a 5-foot length of 1-inch diameter, 0.020-slot, PVC well screen. The top of the well screens are between 5 feet (GP-2) and 11 feet (GP-3) below grade. A 1-inch diameter, PVC riser pipe extends from the top of the screen to the surface. Each well is completed at grade with a bolt-down roadbox and a locked plug. The location of soil borings and microwells is shown on Figure 3.

Four additional soil borings which were completed as monitoring wells MW-5, MW-6, MW-7 and MW-8 were drilled using the hollow-stem auger drilling technique. Soil samples were collected at 5-foot intervals, logged, screened with a PID and selected soil samples were analyzed by EPA Method 8260 and 8270.

Additional monitoring wells, MW-5, MW-6, MW-7 and MW-8, were also completed with a 10-foot length of 4-inch diameter, 0.020-slot, PVC well screen and 4-inch diameter, PVC riser pipe extending from the top of the well screen to grade. The location of soil borings and 4-inch diameter monitoring wells are shown on Figure 3. Additionally, soil characterization for the completed borings as well as completed well construction specifications were recorded on individual geologic logs and are presented in Appendix B.

Following monitoring well installation, a top of casing survey of all monitoring wells and microwells was conducted at the Site. The elevations were adjusted to the Brooklyn Topographic Datum on the basis of a previously established elevation on Monitoring Well MW-3.

In June 2001, fluid levels and total depths were measured in MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, CE-1, CE-2, CE-3, CE-4, GP-1, GP-2 and GP-3.

All groundwater level measurements and sampling were observed by LMS (Con Edison's consultant). Following fluid-level measurements, three well volumes of groundwater were removed from each well, either with a dedicated polyethylene bailer or with a previously decontaminated, submersible pump. All purge water was contained for appropriate off-Site disposal. After the groundwater level within each well recovered, groundwater samples were

collected with a dedicated polyethylene bailer. The groundwater samples were then split between LBG and LMS.

All groundwater samples were analyzed for VOCs and semivolatile organic compounds (SVOCs) by EPA Methods 8260 and 8270. In addition, groundwater from MW-4 and NAPL samples from CE-1 and CE-2 were analyzed by Gas Chromatography Flame Ionization Detected (GC-FID) techniques.

Boring logs show that overburden soil beneath the site consists of generally medium to fine sand and silt. Occasionally, a small amount of gravel was encountered. Bedrock was not encountered to the maximum depth drilled (i.e., 65 feet below grade).

The groundwater elevation data show that the groundwater flow is westward toward the East River. The average hydraulic gradient across the study area is 0.01.

The results of laboratory analyses indicated that the highest concentrations of VOCs in soil is in the vicinity of borings CE-1, CE-2, CE-3 (located off-Site on the adjacent Con Edison parking lot) and GP-3 (beneath the Site). Xylenes and acetone are the most prevalent VOCs in soil, with toluene and ethylbenzene also present at high concentrations. Xylene concentration in the CE-1 soil sample was 3,200,000 ug/kg and acetone concentration in the GP-3 soil sample was 640,000 ug/kg. Low concentrations of toluene, ethylbenzene and xylenes were detected in a soil sample collected from the GP-2 boring. Laboratory analysis data for soil samples are summarized in tables presented in Appendix E.

The results of laboratory analysis indicated that groundwater from all 13 wells sampled contained detectable concentrations of dissolved VOCs. The highest concentrations of dissolved VOCs were encountered in groundwater sampled from wells CE-1 and CE-2. Xylenes were the most prevalent VOC in groundwater and were detected at concentrations of 1,200,000 ug/l and 1,400,000 ug/l in groundwater samples from CE-1 and CE-2. Other detected VOCs included toluene, ethylbenzene and acetone at concentrations on the order of 10^5 ug/l.

NAPL consisting of mixture of various solvents (primarily acetone, toluene, ethylbenzene and xylene) was measured in CE-1 and CE-2 in June 2001, at thicknesses of 0.84 foot and 0.02 foot, respectively. The NAPL was removed by bailing from both wells during

groundwater sampling and periodically when Con Ed access was available. Subsequent measurements of these wells indicated that the NAPL thickness in CE-1 had recovered to 0.01 foot and there was no remaining NAPL in CE-2. In July 2001, CE-2 was dry (i.e., no water or NAPL) and CE-1 had a NAPL thickness of 0.14 foot.

Detected VOC concentrations in the groundwater sample collected from downgradient well MW-4 ranged from 3,400 ug/l to 18,000 ug/l and included acetone, toluene, ethylbenzene and xylene. Acetone, toluene, ethylbenzene and xylene were also detected in groundwater samples from upgradient wells MW-6 and MW-7 at concentrations ranging from 6 ug/l to 200 ug/l. Xylene was detected in all wells sampled. A summary table showing laboratory analysis results for 2001 groundwater sampling is included in Appendix F.

2.5.2.3 2003 Site Inspection

At the request of the NYSDEC, a site inspection was completed at the Fyn Paint facility on May 27, 2003. The site inspection was conducted by LBG in the presence of Mr. William Feinstein, owner of Fyn Paint & Lacquer Co., Inc. and Mr. Howard Simka, chemist for the facility. The purpose of the inspection was the following:

- develop an inventory of the materials used for preparing paint at the time of the inspection;
- obtain data regarding the paint preparation process; and,
- determine the presence of potential leaks or spills related to the storage of chemicals and manufacturing of paint and pathways for such materials to reach the environment.

The site inspection started at the first floor (ground level) of the facility from the Kent Avenue entrance. The following materials used for paint were stored on the first floor.

- Titanium dioxide pigment (six 50 pound bags).
- Talc powder (eleven 50 pound bags).
- Various powder paints for coating (forty-five 55 and 44 pound boxes).
- Twenty empty 1-gallon cans.

- Solvent 100 (one sealed 55-gallon drums and one 55-gallon drum containing 10 gallons).
- Lacquer (one hundred thirty 5-gallon containers).
- Water based paint (fifteen 5-gallon plastic containers).
- Kelsol water-based resin (thirty-five empty 55-gallon drums).

The access to the second floor is via a staircase located in the vicinity of the Kent Avenue entrance. In addition, a service lift (only for chemicals) is used to bring drums and containers of chemicals from the first floor to the second floor. The second floor is used for storage and paint processing by mixing various chemicals. The final products are various paint colors. The inspection identified the following:

- Thirty-four 55-gallon drums sealed containing processing chemicals.
- One empty, out-of-service 550-gallon blending tank.
- Six mixers.
- Four empty, out-of-service 175-gallon tanks (information not available).
- Two sand mills.
- empty 5-gallon containers for final product.
- empty 55-gallon drums, for storage of final product.

During the visit Fyn Paint provided a list of hazardous chemicals used at the facility for paint manufacturing (see attached MSTS list, Appendix J). LBG interviewed Mr. William Feinstein (owner) and Mr. Howard Simka (chemist) regarding the quantities of hazardous chemicals stored at the site during the visit. The following is the list of the hazardous chemicals supplied by Fyn Paint.

The list represents the chemicals stored during the May 27, 2003 inspection.

Solvents (All purchased in 55-gallon steel, sealed drums)

- Acetone: one full 55-gallon drum and one 55-gallon drum containing 15 gallons
- N butyl acetate: one full 55-gallon drum
- N butyl alcohol: one full 3-gallon container

- Methyl alcohol: one full 55-gallon drum and one 55-gallon drum containing 40 gallons
- Isopropylalcohol: None currently stored on-Site
- Solvent 100: one full 55-gallon drum and one 55-gallon drum containing 10 gallons
- Blend 90 (lacquer thinner): two full 55-gallon drums and twenty-five full 5-gallon containers
- Blend BA cleaning solvent: None currently stored on-Site
- VMP naptha (aliphatic hydrocarbon): one 55-gallon drum containing 45 gallons
- Toluol (toluene): one full 55-gallon drum
- Xylol (xylene): one full 55-gallon drum and one 55-gallon drum containing 18 gallons
- Oxsol: (total of 42 gallons packaged in 5-gallon containers

Resins

- Alkyd resins: fifteen full 55-gallon drums
- Water reducible resins: twelve full 55-gallon drums
- Melamine resins: one full 55-gallon drum
- Nitrocellulose resins: six full 55-gallon drums
- Finished paint product: fifteen cases (six 1-gallon cans per case), and fifty full 5-gallon containers

The manufacturing process at the Site was also evaluated during the site inspection. The first floor is used for receiving chemicals which are stored for sale to various customers. The powdered paint is not manufactured at the facility.

All other chemicals received at the first floor, via Kent Avenue entrance or North First Street, are in 55-gallon steel sealed drums or containers of 5-gallon capacity. No manufacturing process takes place on the first floor. During the visits, no significant stains, drains or other areas of possible spill or leaks of chemicals were observed on the first floor. According

to the owner of the facility, Mr. William Feinstein, no bulk deliveries were made at the site since December 1999 when the facility's underground storage tanks were taken out of service and abandoned in place in accordance with applicable regulations.

The paint manufacturing takes place at the second floor where various chemicals are mixed using the existing six mixers. In general, the manufacturing process is the following:

The chemical containers or drums from the storage area located on the first floor are transported to the second floor using an electric lift. The chemical ingredients are measured and put into the mixing vessel. After mixing and quality control process the finished batch is strained, set in the appropriate containers and labeled.

The site visit and inventory indicated the following:

1. First Floor
   - first floor is used for storage of processed chemicals and finished products;
   - no underground storage tanks are in use at the site; the USTs were abandoned in place in 1999; all fill boxes were sealed at the same time;
   - no drainage or other pathway for leaks of chemicals to underground were observed at the first floor; and,
   - the first floor appears to be generally well kept.
2. Second Floor
   - this floor is used for paint manufacturing;
   - the floor, drums and mixing basins are splashed with paint; and,
   - there is no pathway or potential for chemicals from this floor impacting the environment. No sinks, drains or floor drains were observed on second floor.

A copy of this inspection is attached as Appendix K.

2.5.2.4 2003 Subsurface Investigation

In 2003, on behalf of Fyn Paint, LBG conducted a Supplemental Remedial Investigation at the Site.

Between July and August 2003, eleven (11) soil borings were drilled using the hollow-stem auger method. Because of subsurface obstructions one boring was completed using the mud-rotary technique. All boring locations were cleared for subsurface utilities and obstructions either by vacuum truck or hand digging, prior to the start of drilling. Soil was sampled in advance of the auger using a 2-foot split-spoon sampling device.

Soil samples were visually inspected, recorded on a geologic log and screened for the presence of VOCs with a PID. All soil samples were sent to Toxikon Corporation (Toxikon) of Bedford, Massachusetts for analysis of VOCs, SVOCs, polychlorinated biphenyls (PCBs), pesticides, cyanide and Target Analyte List (TAL) metals by methods outlined in the EPA SW-846 publication. Laboratory analysis of soil samples are included Appendix E.

Soil cuttings generated during drilling were transferred to New York State Department of Transportation (NYSDOT) approved 55-gallon steel drums and stored temporarily inside the Site building pending off-Site disposal. The drums were removed from the Site and disposed at Vexor Technology, Inc. of Medina, Ohio. Laboratory analyses and manifests are on file at LBG and are available for review upon request.

Following the completion of soil borings, a monitoring well was installed in each borehole. All monitoring wells installed during the Supplemental Investigation with the exception of MW-16 are constructed of 4-inch diameter. MW-16 was constructed with 2-inch diameter PVC screen and riser pipe. Twenty feet of well screen was set in each boring with the exception of MW-12 where a subsurface obstructed necessitated that 15 feet of screen be used. The screen length was set for seasonal fluctuation and to allow NAPL to enter the well. Wells were completed at grade with a well plug and 8-inch diameter street box. The location of monitoring wells is shown on Figure 3. Additionally, soil characterization for the completed borings as well as completed well construction specifications were recorded on individual geologic logs and are presented in Appendix B.

The newly-installed monitoring wells were developed to remove fine material from the sand pack and from within the well screen by surging them with a PVC bailer and evacuating turbid well water with a suction pump or bailer. Approximately 50 gallons of development water was removed from each new well. All development water was contained in 55-gallon

drums inside the Site building and disposed in the same manner and on the same dates as the drill cuttings.

The laboratory analyses showed the highest concentrations of VOCs (toluene, xylene, ethylbenzene, acetone, isopropylbenzene and naphthalene) in soil to be located in samples collected from the soil boring for monitoring well MW-15 which is located on the east-northeast corner of the Site building along Kent Avenue. Soil samples from borings MW-11 and MW-12 also had significantly elevated levels of toluene, xylene and ethylbenzene detected in the soil.

Analysis of groundwater samples collected from the twelve monitoring wells contained dissolved VOCs at concentrations above NYSDEC Technical and Operational Guidance Series (TOGS) Groundwater Quality Standards (GWQS). In addition, several chlorinated solvents such as PCE, trichloroethene (TCE) and 1,1,1 trichloroethane were detected in groundwater samples collected from MW-5, MW-6 and MW-7. The source of the chlorinated solvents in groundwater could not be identified during the subsurface investigation; however the highest concentration of PCE identified throughout the Site in groundwater were found in June 2001 in CE-1 and CE-2 (960 ug/l and 1,400 ug/l, respectively) both of which are located on the adjacent Con Ed property. The chlorinated solvents were also detected in the soil at 8,200 ug/kg in CE-1 sample (8-16 ft bg) and 2,300 ug/kg in CE-2 sample (8-12 ft bg) (Appendix E). A summary table showing groundwater quality data for the 2003 investigation is included in Appendix F.

Also in 2003, NAPL was observed in wells MW-15, CE-1 and MW-9A, and had previously been observed in well CE-2. The greatest thickness was observed in MW-15. The NAPL appeared to be confined to the area beneath the north wall of the Site building and the adjacent Con Edison parking lot north of the Site. Following the completion of the 2003 investigation, NAPL was bailed from these wells and stored temporarily inside the on-Site building pending off-Site disposal.

An initial soil vapor sampling round was conducted in July 2003. The 2003 soil vapor sampling points are shown on Figure 4. The results of this investigation indicated that VOCs were present in soil-gas samples collected from both the perimeter and interior of the Site

building. VOCs were detected in every soil-gas sample as well as the ambient (outdoor) air sample. The most prevalent VOC in the soil gas was acetone and was detected at concentrations up to 1,180,000 ppbv (Sample AS-6). Other VOCs detected at high concentrations were toluene, xylenes and isopropanol. Additionally an air sample was collected from inside the Site building. The indoor air sample had VOC concentrations that correlated with the soil gas samples, where the compounds detected in the highest concentrations included acetone, toluene and isopropanol.

2.5.2.5 2004 Groundwater Monitoring

In February 2004, LBG performed a groundwater sampling round which consisted of sampling of 18 monitoring wells on and surrounding the Site (Figure 3). The results of this groundwater sampling round indicate that the same primary contaminants observed in the dissolved phase throughout the Site were still present at similar concentrations to previous monitoring rounds, with the exception of MW-4 which showed a significant decrease in VOC concentrations. Additionally, CE-2 and MW-9A were not sampled due to the presence of NAPL observed on the water table. As such, there is no 2004 groundwater data for these wells to correlate with the previous sampling events. A summary table showing the results of the groundwater sampling round is included in Appendix F.

2.5.2.6 Supplemental Environmental Site Audit

In January 2005 an additional site visit was conducted at the Site. This site visit was in response to an NYSDEC letter dated December 16, 2004 requesting that an Environmental Site Audit (ESA) be performed by a Professional Engineer. This ESA included the following:

- compiling a list of all materials stored in 55-gallon drums located in the factory building; and,
- inspection of onsite drains and pipes, and inspection of all piping located on the first and second floor and basement.

A copy of the report detailing this ESA is included in Appendix L.

2.5.2.7 2005-2008 Subsurface Investigation

In 2005, following the NYSDEC approval of the "Supplemental Investigation Work Plan (Addendum I – Revised)", LBG conducted an additional subsurface investigation on behalf of Fyn Paint. The investigation included:

- installation of 8 monitoring wells and 2 extraction wells;
- development of the newly installed groundwater wells;
- abandonment of the micro-wells (CE-1, CE-2 and CE-3) on the Con Edison parking lot;
- soil quality analysis;
- groundwater sampling and analysis;
- a soil vapor survey; and,
- a groundwater pumping test.

The location of 8 monitoring wells and 2 extraction wells is shown on Figure 3.

2.5.2.7.1 *Monitoring Well Installation and Soil Sampling*

In 2005, Fyn Paint installed eight (8) additional groundwater monitoring wells (MW-20, MW-21, MW-22, MW-23, MW-24, MW-25, MW-26 and MW-27) and two (2) groundwater extraction wells (EW-1 and EW-2). The locations of these wells are shown on Figure 3. Prior to installing the wells, soil samples were collected from each boring location using the Geoprobe drilling method. The soil sample which exhibited the highest PID concentration for each boring was placed into laboratory supplied containers and stored in a cooler with ice. The soil samples were then submitted to a New York State certified laboratory, under chain of custody procedure, for analysis of VOCs by EPA Method 8260.

Following the soil sampling, the monitoring wells were installed using the hollow-stem auger drilling method. The monitoring wells and extraction wells (well screen and riser) were constructed of 2-inch diameter and 4-inch diameter stainless steel, respectively. MW-20 was constructed with 2-inch diameter PVC well material due to its distance from the source area

and low concentrations of dissolved phase contamination detected in adjacent wells. Following the installation of the eight monitoring and two extraction wells, they were all developed. The wells were developed using a reciprocating pump with a check valve in conjunction with a suction pump. All purge water was temporarily stored in 55-gallon steel drums pending offsite disposal. Disposal manifests are on file at LBG and are available for review upon request. Geologic logs and monitoring well construction diagrams are presented in Appendix B.

2.5.2.7.2 *Abandonment of the Micro-Wells on the Con Edison Parking Lot*

In addition to the installation of new wells, the three micro-wells on the Con Edison parking lot (CE-1, CE-2 and CE-3) were removed and the locations backfilled with clean sand and an asphalt cap. Of note, the three micro-wells, which were constructed of 1-inch diameter PVC, were no longer competent wells as the PVC had been compromised due to the nature of the contamination. As observed during the abandonment activities, the PVC well material had lost all rigidity and the screen slots were closed. This observation confirmed the selection of stainless steel screen and riser for the newly installed monitoring and groundwater extraction wells at the Site.

2.5.2.7.3 *Soil Quality Analysis*

Soil samples collected prior to the installation of the 8 new monitoring wells indicated that the highest soil contamination is present in the east end of the Con Edison parking lot adjacent to the Site. The highest VOC concentrations were found in MW-22 with acetone detected at a concentration of 19,000 ug/kg, total xylenes detected at a concentration of 7,000,000 ug/kg, toluene detected at a concentration of 4,000,000 ug/kg and ethylbenzene detected at a concentration of 1,500,000 ug/kg. VOCs in MW-23 were found in the following concentrations: toluene at 770,000 ug/kg, ethylbenzene at 520,000 ug/kg and total xylenes at 3,050,000 ug/kg. Tables summarizing soil quality laboratory results for historical soil samples collected from the Site are included in Appendix E.

2.5.2.7.4 *2006 Groundwater Pumping Test*

In order to evaluate the feasibility of groundwater remediation using a pump and treat system, a pumping test was conducted on extraction well EW-1, a 4-inch diameter stainless steel well constructed on the Con Edison parking lot adjacent to the northeast corner of the Site. The purpose of the test was to calculate the hydraulic conductivity of the formation, determine the radius of influence on the groundwater table, and to obtain data necessary for designing the groundwater extraction system. The field data indicates a water-table aquifer in the overburden on top of surficial bedrock. The pumping test was conducted on April 4 and 5, 2006 from EW-1 at a rate of 4.75 gpm (gallons per minute) for approximately 18 hours. The groundwater from the well was pumped in a 10,000-gallon fractionation tank. The water from the fractionation tank was disposed of offsite by Con Edison. Prior to and during the pumping test, groundwater levels were measured in the pumping well and surrounding monitoring wells. Prior to, during and after the 18-hour pumping test, depth to groundwater was measured and drawdown was calculated in the pumping well and selected monitoring wells.

Based on groundwater level measurements recorded during the pumping test, a 4.75 gpm pumping rate from extraction well EW-1 is capable of influencing the groundwater table for a radius of approximately 60 feet. This result demonstrates that a groundwater pumping rate of 4.75 gpm has the potential to induce a cone of depression sufficient for extraction from the subsurface of groundwater with dissolved chemical compounds and/or NAPL and to control further off-Site migration of contaminated groundwater. The pumping test results indicated that the groundwater remediation at the Site can be accomplished by the groundwater extraction and treatment (i.e., "pump and treat") technology. Detailed data regarding the pumping test are included as Appendix D. The pumping test data from EW-1 was used to calculate transmissivity (135 ft^2/day), storage coefficient (0.0943) and hydraulic coefficient (2.7 ft/day).

2.5.2.7.5 *Groundwater Sampling and Analysis (2005-2008)*

All of the newly installed wells and the previously installed wells were then included in the quarterly groundwater monitoring program. However, several wells (MW-6, MW-13, MW-15 and MW-25) were not included in future groundwater sampling rounds as they were

destroyed by city sidewalk repair activities. Additionally, other wells were not included in various groundwater monitoring rounds as a result of access restrictions or because the wells were abandoned. The total number of remaining wells included in the quarterly monitoring and sampling in February 2008 is 21.

Groundwater monitoring and sampling was performed in December 2005. The laboratory results for the groundwater samples indicated the continued presence of VOCs in the groundwater and that the major contaminants at the Site continue to be toluene, xylenes, acetone and ethylbenzene. Summary tables showing the historical groundwater elevations for wells both onsite and offsite are included in Appendix C and summary tables of laboratory results for the historical groundwater sampling events conducted for the Site are included in Appendix F.

In May 2006, September 2006, December 2007, March 2007, October 2007 and February 2008, groundwater monitoring and sampling rounds were performed at the Site. The laboratory results for the groundwater samples again indicated the continued presence of VOCs in the groundwater and that the major contaminants at the Site continue to be toluene, xylenes and ethylbenzene. The acetone concentrations in the October 2007 samples were all non detectable and showed a significant decreasing trend following the implementation of the IRM groundwater pump and treat system. In addition to the groundwater contamination, NAPL was observed in monitoring wells MW-21, MW-22 and MW-9A. During the September 2006 sampling round, NAPL was drawn in to monitoring wells MW-21 and MW-22 as a result of the low-flow groundwater sampling from each respective well. Summary tables showing the historical groundwater elevations for wells both onsite and offsite are included in Appendix C and summary tables of laboratory results for the historical groundwater sampling events conducted for the Site are included in Appendix F.

The laboratory analysis data from the down-gradient monitoring wells located on the west side of River Street (MW-4, MW-5, MW-12, MW-14 and MW-20) showed non-detectable levels and/or a general decrease in concentrations of the five major contaminants (acetone, benzene, toluene, ethylbenzene and xylene) between December 2006 and February 2008. Non-detectable levels of the five major contaminants were also observed in down-

gradient wells MW-1, MW-2, MW-3 and MW-10 in groundwater samples collected in March and October/November 2007. Laboratory data for groundwater samples collected from cross-gradient monitoring wells located on North First Street showed non-detectable concentrations of the five major contaminants in groundwater samples from MW-8 and MW-26 from December 2006 to February 2008.

When evaluating the data from past sampling rounds, the plume migration seems to have been minimal with the concentrations of the primary contaminants of concern being confined beneath the Site and the adjacent Con Ed property with migration to the south (just across North First Street) and to the west (just across River Street). Figures illustrating the approximate dissolved phase plume extents for sampling events in 2004, 2005, 2006 and 2007 are presented in Appendix M.

2.5.2.7.6 *Soil Vapor Survey (2005)*

A second soil vapor survey was performed in 2005, both on-Site and off-Site, to evaluate the potential impact to adjacent properties. The soil vapor sampling locations are shown on Figure 4. Two compounds, PCE and TCE, were detected at concentrations exceeding the New York State Department of Health (NYSDOH) air guidance value established for indoor air quality in eight of the eleven sample locations, SG-1, SG-2, SG-5, SG-7, SG-8, SG, SG-10 and CE SG-6; however, these values are not applicable to regulating soil vapor concentrations. The highest concentrations of PCE and TCE were detected in SG-10, located in the Con Edison parking lot adjacent to the Site. Several other VOCs (such as xylene, ethylbenzene, 1,1,1 TCA, acetone, etc.) were detected above the laboratory detection limits, however; there are no established NYSDOH air guidance values for these compounds. A "Soil Vapor Survey Report" was submitted to NYSDEC and NYSDOH in February 2006. The agencies provided comments on the report and a response to NYSDEC and NYSDOH comments on the report was submitted in August 2006.

2.5.2.7.7 *2007 Soil Vapor Intrusion Investigation*

Based on the presence of VOCs detected in the soil vapor surrounding the Site during the 2005 soil vapor sampling event, subsequent soil vapor intrusion (SVI) sampling was requested by NYSDEC and NYSDOH. This sampling was requested to be performed at the Site building and the adjacent Con Edison building, as well as at properties to the north, south and east of the Site. Prior to the commencement of the SVI sampling, both verbal and written access requests were submitted to property owners in the neighborhood. Several property owners granted access for the SVI sampling, while some property owners refused to grant access to their properties for SVI sampling.

The SVI investigation was conducted in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). The SVI investigation consisted of collecting sub-slab soil vapor and indoor air samples from various locations between February 13, 2007 to May 16, 2007. The purpose of the SVI investigation was to determine the following:

- potential for current human exposure;
- potential for future human exposure; and,
- need for measures to be implemented for removal of vapors from the subsurface.

All activities conducted in conjunction with the SVI investigation were conducted in adherence to the site's Health and Safety Plan (HASP) which was used for the implementation of the Site Investigation activities.

As a result of the remedial investigation activities, a characterization of the soil vapor and indoor air quality at the Site and at properties surrounding the Site has been completed. The results are presented in the RIR. The 2007 sampling locations for the SVI sampling survey are shown on Figure 5.

Based on the NYSDOH Soil Vapor/Indoor Air Matrices (which correlates soil vapor concentrations and indoor air for TCE, PCE, 1,1,1-TCA and carbon tetrachloride), the recommended course of action for the Site building consists of: *Monitor* based on the TCE de-

tected in the soil vapor (<54 ug/m^3 in first floor sub-slab) and indoor air (<0.107 ug/m^e) in the first floor; and, *Monitor/Mitigate* based on the TCE detected in the soil vapor (<210 ug/m^3 in basement sub-slab) and indoor air (0.322 ug/m^3) and *Monitor* based on the PCE detected in the soil vapor (<270 ug/m^3 in basement sub-slab) and indoor air (1.7 ug/m^3) in the basement of the building. It should be noted however that the Fyn Paint building is an active manufacturing facility and that indoor air concentrations are below established Occupational Safety and Health Administration (OSHA) limits. Summary tables showing the VOC concentrations detected in the soil vapor, indoor air and outdoor ambient air samples from the 2007 sampling round conducted in the Fyn Paint factory are presented in Appendix G.

The laboratory analyses of the soil vapor samples concluded that several VOCs were detected in the soil vapor beneath the Con Edison property located adjacent to the Site at 214 Kent Avenue. It should be noted that none of the indoor air samples collected from Con Edison property contained concentrations of PCE, TCE or methylene chloride above the established NYSDOH indoor air guidance values. Additionally, based on the NYSDOH Soil Vapor/Indoor Air Matrices (which correlates soil vapor concentrations and indoor air for TCE, PCE, 1,1,1-TCA and carbon tetrachloride), the recommended course of action for the Con Edison property (with respect to addressing soil vapor and soil vapor intrusion concerns) consists of ***No Further Action*** for TCE, 1,1,1-TCA and PCE. Although the carbon tetrachloride concentrations were below the laboratory detection limit, the recommended course of action for the Con Edison property (as a result of the laboratory detection limit not being below 0.25 ug/m^3) *is taking reasonable and practical action to identify source(s) and reduce exposure*. Summary tables showing the VOC concentrations detected in the soil vapor, indoor air and outdoor ambient air samples from the 2007 sampling round conducted on the Con Ed property are presented in Appendix G.

The laboratory analyses of the soil vapor samples concluded that several VOCs were detected in the soil vapor beneath surrounding buildings to the north, east and south of the Site (210 Kent Ave., 229 Kent Ave. and 240 Kent Ave.). Summary tables showing the VOC concentrations detected in the soil vapor, indoor air and outdoor ambient air samples from the 2007 sampling rounds conducted at 210 Kent Ave., 229 Kent Ave. and 240 Kent Ave. are pre-

sented in Appendix G. Based on the NYSDOH Soil Vapor/Indoor Air Matrices (which correlates soil vapor concentrations and indoor air for TCE, PCE, 1,1,1-Trichloroethane and carbon tetrachloride), the most conservative recommended course of action for each of the properties surrounding the Site building are as follows:

- *210 Kent Ave. - Taking reasonable and practical action to identify source(s) and reduce exposure* based on the TCE detected in the soil vapor (4.8 ug/m^3 in the sub-slab) and indoor air 0.43 ug/m^3) as well as a results of the laboratory detection limit of carbon tetrachloride not being below 0.25 ug/m^3.
- *229 Kent Ave. - Monitor/Mitigate* based on the TCE detected in the soil vapor (120 ug/m^3 in the sub-slab and indoor air 82 ug/m^3). It should be noted that if the TCE concentration for the indoor air using the SIM mode (low detection limit) was <0.107 ug/m^3, a concentration which when compared with the sub-slab concentration would make the NYSDOH recommended course of action *Taking reasonable and practical action to identify source(s) and reduce exposure. Taking reasonable and practical action to identify source(s) and reduce exposure* would also be the course of action as a result of the laboratory detection limit of carbon tetrachloride not being below 0.25 ug/m^3.
- *240 Kent Ave. - Taking reasonable and practical action to identify source(s) and reduce exposure* based on the TCE detected in the soil vapor samples (<11 ug/m^3 in the sub-slab #2 and 4.8 ug/m^3 in the sub-slab #3, and indoor air 0.914 ug/m^3) as well as a result of the laboratory detection limit of carbon tetrachloride not being below 0.25 ug/m^3.

2.6 SIGNIFICANT THREAT

The NYSDEC and NYSDOH have determined that this Site poses a significant threat to human health and the environment.